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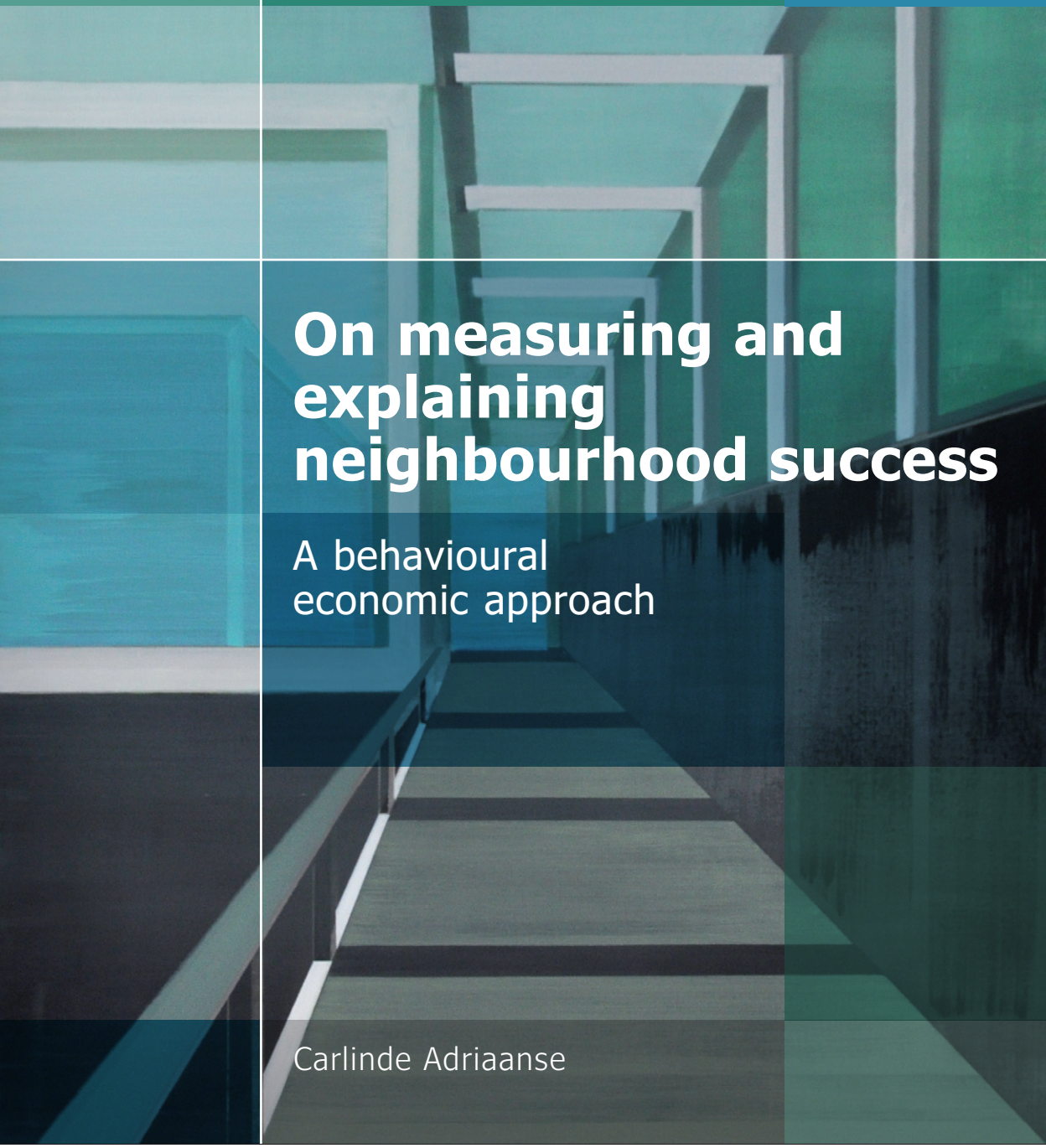

On measuring and explaining neighbourhood success

A behavioural economic approach

Carlinde Adriaanse

TU Delft

Delft Centre for Sustainable Urban Areas

Delft University of Technology

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A behavioural economic approach

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Contents

Preface

This book is the result of the third opportunity that arose for me to write a PhD thesis. The first time was shortly after I finished my graduate research, but at that juncture I wanted to try my hand at a job outside the university. Nor did I take the next opportunity because I wanted to work close to home in Overveen, where Luc and I had just bought our first house. The ensuing years were hectic but beautiful: gaining experience in jobs within and outside academia, as a homeowner, and later as a working mother of two great kids. Then I felt an urge welling up from deep inside: to take up the challenge of conducting research and writing a PhD thesis. So when I started to work at OTB in 2003, I seized the opportunity that was offered to me, for which I am very grateful!

A PhD thesis is a demonstration of an individual's capacity to do academic research, yet this cannot be accomplished alone. I am grateful for the help of several others, particularly Professor Peter Boelhouwer. I deeply value his support in allowing me to develop the research in relative freedom, taking this as a sign of his confidence in a good outcome. At the last stage of the writing process, Professor Andreas Flache, as a member of the PhD committee, commented on the draft version. I am very grateful for his important and precise comments, especially on the theoretical framework. I also want to thank my beloved husband Luc Taal – himself a PhD for several years now – for his statistical advice and the anonymous referees who provided very useful comments on earlier versions of the papers and articles contained in this book.

Of particular importance was the opportunity that the OTB Research Institute for Housing and Mobility Studies of TU Delft offered me. At OTB, I could pursue research on an issue that was driven by my own personal interests besides having theoretical and practical relevance. I am grateful to former and current colleagues at the Department of Urban Renewal and Housing for reading and commenting on earlier drafts of the articles comprising my thesis, namely Alex Curley, André Ouwehand, Anirban Pal, Christien Klaufus, Eva Bosch, Frank Wassenberg, Gelske van Daalen, Helen Kruythoff, Leeke Reinders, Marco van der Land, Mariska van der Sluis-van Meijeren, Reinout Kleinhans, Reijnt Sluis, Saskia Binken, Suzanne Davis, Talja Blokland, Ton van der Pennen, and Wenda Doff. Special thanks are due to Martijn Arnoldus and Gwen van Eijk; Martijn helped with constructing and adding variables to the main data file, and Gwen helped interview residents of Buitenveldert-Amsterdam. Thanks are also due to Martine de Jong-Lansbergen and Truus Waaijer, who offered indispensable secretarial support, and to Itziar Lasa Epelde for the graphic design of the manuscript.

I would like to express my gratitude to Professor David Varady of Cincinnati University. I met him at the ENHR conference in Ljubljana in 2006 and then worked with him during his stay as a guest researcher at OTB. We took interesting trips to urban sites in Amsterdam, and he and his wife Adrienne visited us in Overveen. Speaking of home, the loving support of my parents,

my sisters and their families, and my friends has been very important to me. I cherish the memory of celebrating not only my birthday with them in the first week of January this year but also the fact that the draft version of the PhD manuscript was ready by then. A special word of thanks goes to my friends Jan Giliam van Arkel and Nelleke den Herder, who will stand by me as my paranimfs when I defend my thesis.

Immeasurable gratitude goes to the three loves of my life, Luc Taal and our kids, Dominique and Catherine. Without them I would not have had the distractions, joy, and courage that were needed to finish this book. Do, too, has reached a milestone: (almost) finished with primary school and starting at the sports junior high school after the summer. And Cath, (almost) eleven, often makes us smile at her impatience about growing up and her outspoken ideas about what she wants to be. Do and Cath, whatever the future brings and whichever choices you make, I am proud of you both and hope you will always be true to yourselves.

Carlinde Adriaanse
Delft/Overveen, April 2011.

1 Introduction

"The first thing to understand is that the public peace – the sidewalk and street peace – of cities is not kept primarily by the police, necessary as the police are. It is kept primarily by an intricate, almost unconscious, network of voluntary controls and standards among the people themselves, and enforced by the people themselves. In some city areas... the keeping of public sidewalk law and order is left almost entirely to the police and special guards. Such places are jungles. No amount of police can enforce civilization where the normal, casual enforcement has broken down."

Jane Jacobs, cited in: Bridge, G. & S. Watson (2010), *The Blackwell City Reader*, p. 274.

1.1 First ideas for the thesis

When I started to work at OTB TU Delft as a general social scientist in 2003, I participated in the research programme Corpovenista, which was in preparation at that time.[1] I developed the research plan for the study of problem-free neighbourhoods of a vulnerable physical-spatial type. Especially with urban reconstruction high on the agenda in several Western European countries, with a lot of money involved and with a great impact on the lives of thousands of residents, it is important to learn from these positive exceptions on the rule. Entire libraries have been filled with literature about the prevalence of problems in these areas, devoting considerable attention to the background, causes and explanations of problems and to the effects of the measures taken (Prak & Priemus, 1984; Heeger, 1993; Schwedler, 1998; Turkington *et al.,* 2003; Argiolu *et al., 2008*). However, much less is known about the factors that cause neighbourhoods to remain vital in physical, economic and social terms in the long run (Brower, 1996; Land, 1969; Lynch, 1960).

In the Netherlands, especially early post-Second World War neighbourhoods are called vulnerable with respect to their physical-spatial characteristics (Buys, 2002; Kruythoff en Haars, 2002). Shortly after the Second World War, mid-rise neighbourhoods were built around the world according to the principles of the CIAM (*Congrès Internationaux d'Architecture Moderne*) movement in modern architecture. The areas are characterized by half-open blocks of buildings, open spaces between the blocks, separated transport routes, and a mix of high-rise and mid-rise blocks of flats and single-family dwellings. Some of the dwellings are in the owner-occupied sector but most are in the (social) rented sector. Post-war housing areas are served by a distributed

1 Corpovenista ('housing associations renew the city') is about the synergy between research, policy and practice in urban renewal. Corpovenista is a collaborative effort of several big housing associations, Aedes (the branch organization), OTB Research Institute for the Built Environment at Delft University of Technology, and research teams at the Universities of Utrecht and Amsterdam.

main route network located between the various neighbourhoods. The local streets inside the areas have a non-distributed structure with few possibilities for through traffic. The streets have low inter-visibility and a low degree of social control, since few windows and doors face the streets (Van Nes & Rueb, 2009). Open areas that cannot be watched or observed by residents from their apartments, long dark hallways, poorly lighted stairwells, and areas where no one in particular is responsible for monitoring activities – all these features reduce the levels of surveillance and the capacity for effective social control (Elliott, Menard, Rankin; Elliot, Wilson & Huizinga, 2006: 48, 49). Besides that, in the seventies and eighties of the 20th century, new groups of starting households and non-native households – among whom a large share of Turkish, Moroccan and Surinamese origin – moved in. The new 'mix' – consisting of elderly people who had lived there since the 1960s and the new households – didn't actually mix in most cases, which put more pressure on the social climate in these early post-Second World War neighbourhoods (Wilson, 1987; Adriaanse, van de Wardt & Hortulanus, 1997; Reijndorp, 2004; Dekker & Rowlands, 2005). In many cases these neighbourhoods became problematic. Nowadays, this type of neighbourhood is associated with below-standard living conditions, deprivation, isolated locations, poverty, a negative image, social isolation, pollution and crime (Prak & Priemus, 1984; Heeger, 1993; Wassenberg, 1993; Knol, 1998; Power, 1997; Van der Meer, 1996; Ministerie van VROM, 1997a, 2000; Power, 1997; RIGO Research & Advies, 1995, 1996; Schwedler, 1998; Skifter Andersen, 2003; Turkington *et al.,* 2004; Musterd & Van Kempen, 2005; Friedrichs, 1997; Groves, Middleton, Murie & Broughton, 2003; Van Kempen, 2003; Turkington, Van Kempen and Wassenberg, 2003). Many early post-war neighbourhoods have encountered serious problems and are now being (or are scheduled to be) radically restructured.

Early post-Second World War neighbourhoods like Kerschoten in Apeldoorn, De Pettelaar in Den Bosch, Mariahoeve and Morgenstond in The Hague, the Kuyperwijk and the Voorhof in Delft and Buitenveldert in Amsterdam are exceptions to the rule. Also these neighbourhoods were built in impecunious times, when good materials were scarce and expensive, and their sound and climate insulation is often of poor quality (Hebly, 2008). But nowadays they are largely free from social 'urban' problems, are highly appreciated by their residents and have developed a self-renewing ability over time, a condition that is the ultimate test for the sustainability of urban districts (Hebly, 2008). As a 'potential environment' these neighbourhoods were equal at the start, but due to differences in use and maintenance they developed very differently as an 'effective environment' (Gans, 1968; Van der Horst, Kullberg and Deben, 2002). Why do problems not occur in certain neighbourhoods where these might have been expected according to the physical-spatial neighbourhood type?

The following sections briefly describe this preliminary case study, con-

ducted in 2004 in Buitenveldert-Amsterdam, because it influenced the design of the overall thesis. For the main research of this book, the empirical research was conducted in Buitenveldert in 2006, the results of which are analysed and described in Chapters 5 and 6.

1.1.1 Buitenveldert-Amsterdam; an exception to the rule[2]

To be able to choose a suitable case-study area for the preliminary study, namely 'a problem-free neighbourhood', the following criteria were defined: (1) the neighbourhood has an average-to-good position on the local housing market; (2) its socio-economic structure is not weak; (3) its liveability (social-cultural) is average-to-good. Buitenveldert-Amsterdam appeared to meet these requirements. Buitenveldert has the typical spatial-physical characteristics of an early post-Second World War neighbourhood. But in contrast to what I expected, I didn't find the 'standard problems' of early post-Second World War neighbourhoods. According to an objective safety index, Buitenveldert is even the safest neighbourhood in Amsterdam (Gemeente Amsterdam, 2010). Even now, more than forty years since it was established, it ranks among the most attractive of Amsterdam's residential areas and has a good position on the regional housing market (Adriaanse, 2004a). This makes Buitenveldert a 'critical case' (Flyvbjerg, 2006), having strategic importance to the general aim of this thesis.

The 'garden suburb' of Buitenveldert was created under the Amsterdam General Expansion Plan (Algemeen Uitbreidingsplan (AUP)) of 1934 at the south side of Amsterdam, together with the western and northern extensions of the city (see Figures 1.1 and 1.2). Van Eesteren was the inspiring leader of the team that produced this highly innovative plan. Urban planning of the AUP was no longer based on a pre-imposed urban aesthetic, as in Berlage's South district of the twenties, but based on scientific geographical and social studies. Van Eesteren was well aware of the potential of rhythmic ordering. His ideas and designs were inspired by the artist Theo van Doesburg and his many international contacts in the CIAM. In 1958 he wrote that the neighbourhood Buitenveldert "is designed within a rhythm of more or less equally-spaced motifs, also called living units" (Van Eesteren, 1958).

The realisation of most parts of the AUP, as the Westelijke Tuinsteden and Buitenveldert, had to wait until after World War II. In 1958 the first housing blocks of Buitenveldert were built. Buitenveldert is positioned between the

2 The preliminary research was – parallel to Buitenveldert-Amsterdam – also conducted in Mariahoeve-The Hague. Because the latter case-study research was focussed on Buitenveldert, the findings on Mariahoeve are left out here. The full description of both case studies is documented in a report (in Dutch) entitled *'Succesfactoren van wijken die werken'; een verkennende studie in twee naoorlogse flatwijken* (Adriaanse, 2004).

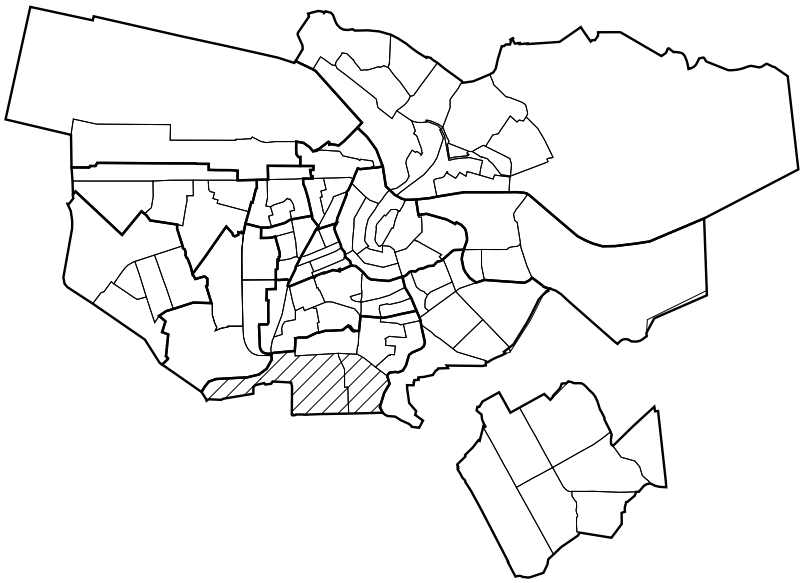
Figure 1.1 Map of Buitenveldert-Amsterdam

Source: Wegener Falkplan BV 2002/2003

southern highway A10 in the north, the river Amstel in the east, the border of Amstelveen in the south and Het Nieuwe Meer in the west (Hebly, 2007). The Gijsbrecht van Aemstelpark stretching out from west to east is the large structuring urban space. The park divides Buitenveldert into a south and a north part. The system of dividing housing types over the area can be described as: different homogeneous neighbourhoods form together a heterogeneous urban district, a patchwork of different neighbourhoods. Every neighbourhood is dominated by one housing type, such as middle high-rise areas with a portico or gallery access system, next to low rise areas and areas with detached and semi-detached houses (Hebly, 2007). Over 80% of the housing stock in Buitenveldert is in multiple-occupancy complexes. The many mid-rise apartment blocks in Buitenveldert have four storeys (the ground floor being used for either residential or business purposes). There are also twelve-storey tower blocks interspersed with eight-storey blocks. Most of the housing stock dates from the 1960s. Buitenveldert has good road connections with surrounding areas of the Netherlands and good public transport to the city centre (Adriaanse, 2004a, b). These and more characteristics can be found in Table 1.1.

The findings of the preliminary study suggest that while Buitenveldert is indeed a neighbourhood that 'works', it is not entirely devoid of problems. Some of the problems commonly associated with early post-war neighbourhoods are seen in the study area. A number of these are directly or indirect-

Figure 1.2 Location of Buitenveldert in the city of Amsterdam



ly related to the specific type of neighbourhood and its construction period. Obsolescence of public areas, physical decay and technical obsolescence in parts of the housing stock are directly related to the building period and the age of the neighbourhood. Other problems, such as potential safety blackspots and the lack of opportunity for young families to move into more suitable accommodation within the same area, are directly related to the type of neighbourhood that Buitenveldert represents. There is a strict division of functions (resulting in inadequate social control) and an overly uniform housing stock comprising mostly apartments in multiple-occupancy complexes and very few self-contained single-family units.

In 2004 Buitenveldert has 18,456 residents. Over one-third (34%) of Buitenveldert's population was aged 65 or above. The vast majority of residents (67%) are of 'native' Dutch origin. Among them, two thousand residents (10% of the population of Buitenveldert) are Jewish[3]. Only 8% can be classified as belonging to non-Western ethnic minorities (see Table 1.2). Both the educational level and the income of Buitenveldert residents are markedly higher than in an average early post-Second World War neighbourhood. The social problems encountered in many early post-war neighbourhoods are not visible in Buitenveldert. There is not a high level of crime, no influx of lower-income groups, no influx of problem groups, and no large-scale exodus of existing residents, all of which could lead to poorer social cohesion (Adriaanse 2004a, b).

3 Source: Joodse Gemeenschap Amsterdam, 2007.

Table 1.1 Basic characteristics of the housing stock in Buitenveldert and the other fifty-four early post-Second World War neighbourhoods in the Randstad

	Buitenveldert	Mean Dutch post-WWII neighbourhoods in the Randstad*
Construction year		
Prior to 1945	2.4%	13%
'45–'60	8.1%	26%
'61–'70	67.0%	39%
'71–'80	4.1%	10%
'81–'90	13.0%	7%
'91–'99	4.0%	5%
'00–'01	1.0%	0%
Total	11199 = 100%	
Unit type (2002)		
Single family home	12%	24%
Multiple occupancy complex	88%	76%
Average housing density per km²	0-2245	2874
Tenure/ownership status (2002)		
Owner-occupied	31%	26%
Social sector	38%	61%
Private rental sector	31%	13%
Property value (1998)		
x 1000 euro's	96	58
Number of rooms (2002)		
1-2 rooms	17%	15%
3 rooms	30%	35%
4 rooms	38%	32%
5 or more rooms	14%	15%

* The early post-World War II mid-rise neighbourhood type is characterized by the following conditions:
1. Located in the Randstad.
2. At least half of the housing stock of the zip-code area in 2003 was built between 1945 and 1980.
3. The share of the dwellings in the total housing stock of the zip-code area is at least two standard deviations above the mean percentage of mid-rise flats in all Dutch neighbourhoods.
4. The housing stock in the zip-code area is not predominantly (not 50% or more) of another type.
5. The zip-code area comprises at least 100 households.
The variables for the construction of these criteria were derived from register data of Wegener and the ABF Woningmarktmonitor 2003.
Sources: O & S Amsterdam, 2002; Wegener data file, 2002; Woningmarktmonitor ABF, 2003

Even though most of the residents are of Dutch origin – including a large Jewish community – the present-day population of Buitenveldert consists of distinct groups living parallel lives. Moreover, Japanese, Korean, English and American expatriates tend to live in the Netherlands only temporarily (rare-

ly longer than ten years). Like the members of the Jewish community, the expats operate primarily within their own group. In fact, few expats speak Dutch. Like the Jewish residents, they have their own shops, schools, restaurants, cafes and facilities; for instance, there is a Japanese drycleaner and an Asian video rental. There are also synagogues, Jewish schools, Jewish-oriented stores and a Jewish home for the elderly in the area (Adriaanse, 2004a, b). In that light, Buitenveldert cannot be called strongly cohesive, but problems between the separate groups do not occur.

Many other early post-Second World War mid-rise neighbourhoods experienced a high turnover rate in the eighties and nineties of the 20th century. Where this was the case, many non-Western ethnic minority residents from restructuring zones elsewhere in the city moved in, bringing with them a lifestyle which is different than that traditionally enjoyed by the existing residents. These processes have not yet become apparent in Buitenveldert, though.

Many early post-war neighbourhoods have a somewhat negative image. A number of key informants report that even Buitenveldert has a less-than-positive image in some regards. Unlike other early post-war neighbourhoods, however, this image is not determined by safety issues, crime or a poor housing-market position, but rather by the fact that Buitenveldert is seen as rather dull. Offering little opportunity for entertainment or spontaneous social contact, young people in particular consider the area only suitable for the elderly.

Which success factors did I find in the preliminary research? Some relate directly to the type of neighbourhood. Others derive from the context of the neighbourhood. Yet others may be traced to the management practice or the policy of local authorities and other stakeholders. Alongside the differentiation in ownership status and the positive housing choice (i.e. people have chosen to live in Buitenveldert rather than having been 'placed' there), key informants cite a number of spatial-physical characteristics and the nature of the neighbourhood itself as success factors. Specifically, these are its position in the higher-status sector of the city (near to the cultural district of Amsterdam-South with its museums, restaurants, and the concert hall), its accessibility, its urban planning design and the plentiful greenery. Such physical-spatial characteristics typify the type of neighbourhood represented by Buitenveldert but also by its more problematic counterparts.

Like all other early post-war neighbourhoods, Buitenveldert enjoys the benefits of the faster, more extensive public transport facilities which have been developed in recent years, bringing the city centre and major cultural facilities within easier reach. However, many early post-war neighbourhoods have become surrounded by newer residential developments, obviating the initial positive aspects of the location such as the proximity to greenery and water beyond the city perimeter. Buitenveldert still enjoys full access to large-scale recreational areas, which are practically adjacent to the neighbourhood and remain within easy walking or cycling distance.

Table 1.2 Basic characteristics of the population of Buitenveldert and the other fifty-four early post- Second World War neighbourhoods in the Randstad

	Buitenveldert	Mean Dutch post-WWII neighbourhoods in the Randstad*
Age group (years) (2002)		
0–4	4%	6%
5–9	9%	17%
20–34	17%	21%
35–49	17%	19%
50–64	19%	16%
65+	34%	21%
Average size of household (2002)	1.7	2.0
Ethnic origins (2002)		
Dutch	67%	60%
Surinamese	3%	
Antillean	1%	Non-western ethnic
Turkish	1%	minorities:
Moroccan	1%	30%
Southern European	2%	Other non-Dutch ethnic
Other non-Dutch (non-industrialized countries)	9%	minorities
Industrialized countries	17%	10%
Population density: persons per km², January 2001	1203–5642	5841
Average disposable income (per earner), January 2001 (euro)	21701 – 26300	22165

* The early post-World War II mid-rise neighbourhood type is characterized by the following conditions:
1. Located in the Randstad.
2. At least half of the housing stock of the zip-code area in 2003 was built between 1945 and 1980.
3. The share of the dwellings in the total housing stock of the zip-code area is at least two standard deviations above the mean percentage of mid-rise flats in all Dutch neighbourhoods.
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5. The zip-code area comprises at least 100 households.
The variables for the construction of these criteria were derived from register data of Wegener and the ABF Woningmarktmonitor 2003.
Sources: O & S Amsterdam, 2002; CBS (Netherlands Statistics), Gemeente op Maat, 2002; Wegener data file, 2002; Woningmarktmonitor ABF, 2003

Further analysis reveals that the construction date of Buitenveldert, slightly later than many other early post-war neighbourhoods, is of significance. The lessons learned during the first wave of construction following the Second World War could be put to good use in the planning. Moreover, the Netherlands enjoyed a somewhat higher degree of general prosperity in the 1960s

Photos by the author


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than it had in the earlier reconstruction years. This enabled the planners to give Buitenveldert a more differentiated urban design structure with a slightly better quality of construction and finishing (using better materials).

Moreover, Buitenveldert was originally intended to attract the middle classes, and did so successfully. The high quality of the neighbourhood, its position in the higher-status sector of the city of Amsterdam and the balanced mix of social, private rental and owner-occupied properties drew a more prosperous group of residents who had chosen to live there for positive reasons. For many years, the level of housing satisfaction was high and the turnover rate relatively low. This served to create a sound social climate, notable for a broad consensus among residents on how the district should be used. In the neighbourhood, a large proportion of the residents are greying. There is thus potential for a higher turnover rate and a greater influx of new residents.

One contextual factor, which diminishes the effects of this development, is that relatively little new construction was undertaken in the immediate vicinity for a long period. Thus, young families and more prosperous seniors did not have the opportunity to move up the housing ladder into more suitable accommodation within the neighbourhood. As a consequence, 25% of the population has lived in the same dwelling since the district's inception (Adriaanse, 2004a, b).

The development of the new office district along Amsterdam's southern axis (called Zuid-as) is now in full swing and Buitenveldert will soon feel the effects. Residents and professional observers recognize both threats and opportunities here. They welcome both the vitalization of the immediate vicinity and the strengthening of Buitenveldert's reputation as a quiet residential district in an urban setting. However, residents are wary of increased traffic and a shortage of parking facilities. Plans for densification of the area are also seen as a threat to one of the success factors identified by residents: the availability of large-scale recreation areas.

Another aspect of the neighbourhood, distinguishing it from the standard early post-war development, is that there is ample employment opportunity either in the neighbourhood itself or nearby. Buitenveldert includes, or is close to, the Zuid-as office district, Schiphol Amsterdam Airport, the VU University Amsterdam, the RAI conference centre and the Amsterdam World Trade Centre. This makes the neighbourhood an attractive location for the highly qualified staff of prominent national and international companies. These factors – good employment opportunities and the presence of more prosperous residents – combine to create a greater level of support for local amenities (the international school, lunchtime catering establishments, shopping facilities, etc.) and to promote the good reputation of Buitenveldert.

The boost given to the neighbourhood by the high-quality construction boom of the 1980s served to compensate, at least in part, the trend of obsolescence and decline that neighbourhoods 'of a certain age' will inev-

itably experience. Good management of the housing stock and the residential environment has also helped to slow the downward trends. Sections of the housing stock in the neighbourhood now require modifications in order to meet the demands of today's residents (and future residents), as do the public areas (Adriaanse, 2004a, b). A final remark on the outcome of the preliminary research relates to the speed of development in Buitenveldert. For many years, development was not particularly rapid. This 'tempo moderato' has enhanced the neighbourhood's ability to adapt, as well as that of the residents. People and neighbourhoods respond more easily to gradual change. Gradual change is also easier to anticipate, provided the effects are recognized in time.

1.1.2 'An intermediary structure of unwritten rules' in Buitenveldert

During my preliminary research in the case-study area in 2003/2004, I often walked along the streets and sensed the atmosphere specific to Buitenveldert-Amsterdam as expressed in the curb-appeal of the dwellings and the overall appearance of the neighbourhood. What struck me was that I didn't see any graffiti or litter in the streets. What I did see was well maintained empty balconies alongside balconies dressed up with plants and flowers in pots. When I passed the residents, they usually smiled or said 'hello'. In the parks, in the indoor shopping centre Groot Gelderlandplein and in and around the shops in the Kastelenstraat I sensed an attentiveness and politeness between the people and towards me. The physical artefacts of good neighbourhood upkeep and the prevailing social norm of neatness and friendliness in the public realm gave me, as an ingenuous visitor, an overall impression of the state of affairs in the neighbourhood. It seemed like a pleasant place, an area that is cared about and an environment that feels viable and safe.

These observations and the preliminary research suggested that the social order in Buitenveldert does not arise in the first place from intimacy and connectedness. Neither does it appear to result from collective social action, as may be the case in 'communities of limited liability' or 'contrived communities', where all defend their interest collectively and social bonds emerge. Buitenveldert lacks strong social cohesion but is also free of strife. It is disorganized and orderly at the same time. My observations in Buitenveldert prompted the notion of an intermediary structure of unwritten rules that can be 'felt' by residents, their visitors and passers-by. An intermediary structure of unwritten rules would seem to be conducive to a viable social climate in Buitenveldert.

Parallel to the preliminary case study in Buitenveldert, I conducted a multivariate data analysis with the objective register data of all Dutch neighbourhoods and the survey data of the Dutch Housing Demand Survey (WoningBe-

hoefteOnderzoek, 2002). In line with the findings from the preliminary case study, the multivariate data analysis suggested that the perception and appreciation of the residential social climate is decisive for the 'success' of a (early post-Second World War) neighbourhood (the findings are described in detail in Chapter 2 of this book). This insight triggered my interest in the mechanisms of informal social control in residential neighbourhoods. This is not about the obligation to have social relationships in the living environment. I sought to reconsider traditional understandings about what is required for peace and tranquillity in human affairs in liveable urban residential environments. The informal residential control I wanted to investigate is about unwritten rules of conduct and mutual trust and respect in informal residential interactions. What I wanted to know is how such an intermediary structure of unwritten rules can endure for a longer period. I came up with the following working definition of a residential social climate:

> The social climate of a residential environment is an individual's perception of how others treat him or her, one another, and (how they will treat) the spatial artefacts within the area that the individual experiences as his or her living environment (Adriaanse 2005, 2008a).

A literature search in scientific journals revealed that the concept 'social climate' appears in studies on 'total institutions' (e.g., schools, workplaces, hospitals and prisons). The term is used by social and developmental psychologists and bio-medical scientists. Research topics in these fields include 'the physical, intellectual and social climate of the classroom', 'the role of the virtual teacher with regards to the social climate in online-learning discussion groups', 'the atmosphere in care settings as experienced by patients' and 'the social climate of alcoholism treatment programs'. Social climate is generally used as a construct that consists of several physical and social-cultural elements, which refer to the spheres of influence of various stakeholders. Social climate is a concept that is intuitively recognizable but difficult to define precisely. It is generally thought to be the sum of the working conditions that are associated with a company, location or work site, which are created by specific organizational policies, practices and behaviours (see for example Coleman, 1961; DeYoung, 1977; Moos and Moos, 1978; LeBlanc, Vitaro & Tremblay, 2007; Ross, Diamond, Liebling & Saylor, 2008). Unless the fact that we cannot consider a residential neighbourhood as a 'total institution' I use the term social climate, because it appears to be a useful concept for describing what goes on in a neighbourhood at an intermediary level between residents over time. The residential social climate as a whole cannot be observed, though its manifestations can. The actions of neighbours can be observed as they occur; spatial artefacts of actions that have taken place in the past provide indications of the social climate in a subdivision or neighbourhood. For example, on one of my walks around Buitenveldert, I noticed cords hanging out of the mail slots

on the porch doors of the social rented flats – meant for opening the door from the outside. Clearly, these artefacts express the trust prevailing in that part of the neighbourhood. Through the trust-generating atmosphere they express, they form a manifestation of the experienced trustworthiness in the territory in the past and they encourage future trustworthiness.

The term social climate carries no moral connotations and thus implies no value judgements. Every residential area has a social climate, which can be good or bad. In contrast, value judgements are implied by the concepts of 'community', 'social cohesion', as well as by the notion of 'liveability'. Social cohesion involves mutual understanding and similar orientation in thought and action. A good social climate, in contrast, involves a minimal social relationship, in the sense that people 'trust one another' and are 'favourably disposed towards one another'. Achieving this does not necessarily require mutual understanding. It merely implies being aware of each other's vulnerability and that one's own behaviour can cause inconvenience to other residents (Atkinson & Flint, 2003; Adriaanse, 2005; Völker, 2009).

1.2 Measurement theory, social dilemmas and behavioural game theory

Reading renowned authors' works on social capital, social cohesion and collective efficacy, I tried to find starting points for a better understanding of the micro mechanisms and processes that I had observed and that construed the social state of affairs I had revealed in Buitenveldert during the preliminary research. In my search for a useful explanatory framework, I was led by three basic scientific principles. The first was methodological individualism. In sociology, Jon Elster (among others) is known for following this guideline. "The elementary unit of social life is the individual human action," he argues. "To explain social institutions and social change is to show how they arise as the result of the actions and interaction of individuals" (Elster, 1989, p. 13). In this thesis methodological individualism asserts that individual choices made by residents will determine whether or not, on an aggregate level, liveability problems will occur in neighbourhoods.

Second, this thesis takes a social-ontological perspective as a point of departure. From this perspective, we can distinguish between reflexive and pre-reflexive behaviour. Reflexive behaviour is based on a deliberate and intentional choice; it refers to actions that can be made reflexive, such as routines and habits. Pre-reflexive behaviour constitutes actions like falling asleep and riding a bike or skating, which cannot be made reflexive at all, or if so only partially. The focus of this thesis is on reflexive behaviour.

The third principle was not to use notions couched in metaphor but rather to be as precise as possible in defining the intention and extension of the

concepts. Here, I was inspired by the idea of Occam's Razor, otherwise known as the law of parsimony. It is a rule for selecting among competing hypotheses: choose the one that makes the fewest new assumptions, all hypotheses being equal in other respects.[4] To use the razor implies that we should tend towards simpler theories up to the point where some simplicity can be traded for increased explanatory power.

Finally, I found an analytical tool and theoretical framework in Behavioural Game Theory. I was attracted by the clearly defined concepts and models of overt human behaviour and interaction and by the structure of the underlying social-dilemma situations and social control that have been developed within the school of Behavioural Game Theory (Camerer, 2003). This theory has a convincing empirical basis due to the fact that hundreds of experiments have been conducted worldwide (Henrich *et al.,* 2004). It suggests a way in which structures create incentives that shape individual choices and thereby collective outcomes. Central elements of Behavioural Game Theory that I will use are the notions of strong reciprocity and altruistic punishment in Prisoner's Dilemmas and Assurance Games. Because an important part of this research is about the development of measuring instruments (scales) one central topic I will discuss in the theoretical framework, covers the measurability of utility. This is followed by a discussion of the theory's applicability for the description and analysis of interactions between residents when they are making interdependent choices and acting repeatedly as producers and maintainers of the 'social climate' in their daily living environment.

1.2.1 Measurement theory[5]

I can define any neighbourhood N as an empirical relational system (ERS) of neighbourhood objects O and agents A. The distinction between objects and agents is that agents have expectations of future states of an uncertain world and preferences over these states. Thus, agents have sets of possible outcomes and possible actions and preferences over action-outcome pairs. Choices of other agents are an important class of possible outcomes. Agents anticipate on actions of other agents.

Properties and variables

Anything relative to which objects O or agents A may vary is a variable. Age

4 Occam's Razor is attributed to the 14th-century English logician, who wrote that "entities must not be multiplied beyond necessity".

5 The distinctions between properties, relations, variables, variable labels and the nine conditions of quantity that are described in the following sections, are derived from Chapter 3 of Joel Michell's book *An introduction to the logic of psychological measurement* (1990), New Jersey: Lawrence Erlbaum Associates.

is a variable: different houses of a neighbourhood may have a different age. The variable 'age' is simply the class of all ages. The class of all ages is a collection of sets (all kinds of objects) which can be defined by the property 'age' that all its members share. Each particular age is an empirical property that a house might posses. So a variable is a class of properties, but not any class of properties constitutes a variable. The properties of being 70 years old, of being 6 meters high, of having a economic value of 400.000 euro taken together do not form a variable because some houses may possess more than one of these properties simultaneously. Empirical properties form a variable if they are mutually exclusive, that is if no house can possess more than one of them simultaneously. The classes of all ages, all heights and all economic values are three variables for any house can only be one age, one height and one value at a time.

Relations

Objects O and Agents A posses properties singly. The empirical fact that a house is 70 years old is a fact about a particular house and nothing else. Relations involve pluralities of objects and agents. If the house is the one most closest to a busy highway then this situation involves both this particular house and all other houses of a neighbourhood. Binary relations involve two objects or agents, ternary relations three objects or agents, and so on. An n-ary relation involves n objects or agents. A class of relations forming a variable is the following: being a direct neighbour. If Agent A is the direct neighbour of Agent B, then B is the direct neighbour of A. The binary relation 'being a direct neighbour' holds not simply between a pair of agents, but constitutes an ordered pair. The class of binary relations 'being a direct neighbour' forms a variable because no more than one of the two relations within it ('being direct neighbours'- 'not being direct neighbours') holds between a particular pair of agents at any one time.

The structure of a variable

Those particular properties or relations of objects O and Agents A that constitute variables are the values of that variable. For example, being 70 years old is a value of the 'age' variable, distance from highway is a value of the location variable, being direct neighbour of agent A1 is a value of the neighbour-variable. The distinction between the empirical behaviour of any objects O or agents A possessing a value of a variable on the one hand and the logical structure of these variables on the other hand, is an important one.

The logical structure of the empirical relation D, 'being a direct neighbour' is:

1) symmetric because $(\forall \text{Agents} \epsilon N)(aDb \rightarrow bDa)$

2) antitransitive because $(\forall \text{Agents } a,b,c \in N)(aDb \wedge bDc \rightarrow \neg aDc)$

The conditions 1 and 2 do nothing more than describe the logical structure of the direct neighbour variable. How the symmetric and antitransitive structure of the 'direct neighbour' variable is reflected in the behaviour of particular agents A depends also on the kind of agents they are (empirical character (for example extravert or introvert personality, his social economic status).

An important example of a well known structure of a variable is the equivalence relation. Consider the relation S 'living in the same street' in more detail.

The logical structure of the empirical relation S, 'living in the same street' is:

1) symmetric because (∀ Agentsϵ N) (aSb → bSa)
2) transitive because (∀Agents a,b,c ϵ N)(aSb ∧ bSc → aSc)
3) reflexive because (∀Agentsϵ N)(aSa)

'Living in the same neighbourhood' is a reflexive relation because every agent lives in the same neighbourhood as itself. The relation S partitions a city in mutually disjoint equivalence classes (here: neighbourhoods).

The logical structure of any quantitative variable

What are the structural marks of a quantitative variable? The following nine conditions characterize any quantitative variable. The first fact to note is that the values of a quantitative variable are ordered. Let H, I, J be any three values of variable D 'distance from of Oi from highway'.

The empirical relation D, 'distance from highway' is ordered if and only if:

(1) if H ≤ I and I ≤ J → H ≤ J (transitivity)
(2) if H ≤ I and I ≤ H → H = I (antisymmetry)
(3) either H ≤ I or I ≤ H (strong connexity).

All quantitative variables are simply ordered by ≤, but are also additive. This is expressed by the following six conditions:

(4) (H + I) + J = H + (I + J) (associativity)
(5) H + I = I + H (commutativity)
(6) H ≤ I if and only if H + J ≤ I + J (monotonicity)
(7) if J > H then there exist a value I such that J = I + H (solvability)
(8) H + I > H (positivity)
(9) there exist a natural number n such that nH ≥ I (where 1H = H and (n + 1) H = nH + H) (archimedean condition).

Measurement and scale type

Having clarified the structural characteristics of a quantitative variable, we are able to describe the concept 'measurement'. We take a simple example.

We wish to know the exact length of the distance between object O1 in neighbourhood N and the highway H. This may be done by relating the distance O1 – H to a length called a meter. The distance is found to be r meters long (where r is some real number). More precise: r is the ratio of the length of the distance, O1 – H to that of a meter and this fact enables the length of the distance to be characterized. Any measurement of some unknown value of a quantitative variable is identified as being r units. A unit of measurement is simply a particular value of the relevant variable that is singled out as a standard to which all other values will be compared. If the value of a measurement standard is already known (M = meter) and the aim is to identify a characteristic of object O1, the distance of O1 to H, then this is achieved by noting that Distance O1 - H = rM. So, any value of a quantitative variable can be expressed as a simple multiple of the unit of measurement. Which particular value of the relevant variable is singled as standard is arbitrary. Say we use the imperial scale (where yard is the unit). Then we simply multiply the meter scale with a positive constant: 0.9144* rM = Yard. The numbers of different lengths of distances on the meter scale discover certain empirical attributes.

According to the representational theory of measurement we can pose the problem how unique the numerical assignments are in the case of the meter scale or any other length scale. Representationalists assign numbers to empirical entities in such a way that certain relations between the numbers assigned represent empirical relations between the entities. The American psychologist S.S. Stevens believed that four types of measurement scales were the most important: ratio, interval, ordinal and nominal scales.

Ratio scales

We are not free to change the values of the distances Oi – H on the meter scale to anything, but it is easy to see when we multiply meter values with a positive constant, we simply change the meter scale into any length scale from the infinite set possible. We can generalize this and formulate: The meter scale is unique up to multiplication with a positive constant. All scale types which have this property (a unit of measurement and a zero-point) are called ratio scales by Stevens (1946).

Interval scales

Interval scales are unique up to a positive linear transformation (x = ay + b, where a is positive number and b is either a positive number or a negative one). A well known example is the temperature scale. The Fahrenheit (F) and Celsius (C) scales are related by the following linear transformation C = (5/9)*F – 160/9. Any interval scale is really a ratio scale upon differences. The Celsius scale measures temperature differences, not temperature as such. The unit of measurement of the Celsius scale is itself a difference (one-hundredth part of the difference between the freezing and the boiling point of water) If object O1 is

built 70 years ago and O2 50 years ago, they differ in age the same as O3 and O4 which were built 40 and 20 years ago, but the zero point Year 1 AD is arbitrary.

Ordinal scales
Ordinal scales are said to be unique up to an increasing monotonic transformation, that is, we can change the values of an ordinal scale to anything at all providing their order of magnitude is left intact. Consider the partition of a collection of Oi into the following classes 'close to Highway (10-15 meters)', 'average distance from highway (15-50 meters)', 'Far away from Highway (50 meters and further)'. We can label these classes with any number, but the ordinal scales we create have to respect the rank order of the magnitude of the distances.

Nominal scale
A nominal scale is just a classification. Numerical assignment follows the rule that each identical object is given the same number. We can change given numbers to anything at all providing that identical objects receive the same number. Suppose that houses are classified according to the kind of roof (pointed roof and flat roof). In this case the empirical relation observed is that of O1's roof being the same as O2 's roof. If this empirical relation is transitive, reflexive and symmetric, it may be represented by the numerical relation (=). Let's assume that pointed roof = 1 and flat roof = 2, then the numbers 1 and 2 of the nominal Roof scale could be replaced by any one-to-one transformation of the nominal roof scale.

Representationalists like Stevens do not recognize that there is a structural difference between ratio and interval scales on the one hand, and ordinal scales on the other, because ordinal scales lack a unit of measurement. Using an ordinal scale, we can sort objects or agents with respect to a certain empirical property, but it would be silly to say we are measuring objects or agents. Numerical coding is not identical to measurement as a procedure whereby values of a relevant variable are compared and their ratio assessed. Thus, all measurements are always of the same ratio scale type. Before measuring anything we have to show that a particular variable is a quantitative variable. In other words, confirmation of the conditions (1) to (9) is necessary. Being quantitative is an empirical condition and not a numerical one.

1.2.2 Social dilemmas and behavioural game theory

The ordinal character of utility
I defined neighbourhood N as an empirical relational system of objects O and agents A, with agents having expectations of future states of an uncertain world and preferences over these states. Now, agent's expectations and preferences over possible action-outcome pairs and subjective probabilities over

outcomes are clearly psychological variables of a certain kind. As such, they cannot be measured directly, but have to be related to an observable quantitative variable of one kind of another (score on questionnaire, amount of money or token allocated in an experiment) which can be measured directly. An important class of action-outcome pairs are the choices of other agents.

The games studied in game theory are well defined mathematical objects within which agents anticipate upon each other's choices and make a choice for themselves. Agents have strategies (A, B, ...). Every agent chooses one and only one strategy. A vector of chosen strategies, one for each agent, is denoted s= (s1, s2, s3 ... sn). The part of this vector which removes agents i's strategy from every other agents's strategy is denoted S-i. Game theory is about consequences. When agent i plays Si, and all other agents choose s-I, this will result in a consequence for agent I and all other agents. This is the possible outcome structure of a game. It is important to distinguish outcome from utility. Utility means that none is better than this choice, as judged by the agent, agent I. In any game, utility represents the motivations and evaluations of the agents. A utility function for a given agent assigns a number to every possible outcome of the game, whereby a higher number implies that the outcome is more preferred. A Nash equilibrium is the situation arising when all agents in a game anticipate correctly upon each other's choice and no player has any incentive to change his or her strategy unilaterally.

Thus, a key assumption of game theory is that agents can express their satisfaction with an outcome-action pair on a numerical utility scale, U. Outcome-action pairs are consequences and the satisfaction with an outcome-action pair is called a pay-off in game theory. Agents have a set of possible pay-offs and subjective beliefs in the probabilities of a pay-off. Intuitively an agent would weigh the utility value of each outcome-action pair on utility scale U by its probability of occurrence P (0-1), U*P. However, agents often do not know the probability of occurrence of an action-outcome pair and are subject to competing motives, whose relative strengths are often indeterminate.

Von Neumann and Morgenstern were rather optimistic in 1944 and took a different approach: they attempted to axiomatize agents' preferences over different ventures with random prospects, as preferences over what they called 'lotteries'. According to Von Neumann and Morgenstern people's preferences are formed over lotteries and from these preferences over lotteries, combined with objective probabilities, we can deduce what the underlying preferences on outcomes might be. Thus, in Von Neumann-Morgenstern's theory preferences over lotteries logically precede preferences over outcomes. The essence of von Neumann and Morgenstern's expected utility hypothesis was to confine themselves to preferences over probability distributions and then from that, deduce the implied preferences over the underlying outcomes.

I am convinced that the Von Neumann-Morgenstern conceptualization is descriptively inaccurate. Moreover, experimental research has made the four

Matrix 1.1 Possible outcome matrix (structure of a Prisoner's Dilemma)

		Others (x)	
		Cooperate	Defect
Me (y)	Cooperate	50,50	0,70
	Defect	70,0	20,20

Von Neumann-Morgenstern axioms (transitivity, completeness, monotonicity and substitution) even suspect. Bostic, Herrnstein & Luce, 1990; Grether & Plott, 1979; Hamm, 1980; Kami & Safra, 1987; Lichtenstein & Slovic, 1971, 1973; Lindman, 1971; Mowen & Gentry, 1980; Pommerehne, Schneider & Zweifel, 1982; Reilly, 1982; Slovic & Lichtenstein, 1983; Tversky, Sattath & Slovic, 1988; Tversky, Slovic & Kahneman, 1990; Keller, 1985; Kahneman & Tversky, 1979).

In the game-theoretic literature it is taken for granted that utility (pay-offs), one of the attributes that structures a game, is quantitative and, silently presuming this, the distinction quantitative – merely ordinal is never explicitly discussed.

In this thesis I assume that the statement "utility is a quantitative variable" is no more than a hypothesis which is not proven yet. With the best will in the world I cannot consider utility as a quantitative variable.

I shall digress briefly to demonstrate the importance of keeping in mind that utility numbers are ordinal. Not all authors distinguish clearly between utility, – the actual choice –, and anticipated possible outcomes, nor do they recognize the ordinal character of utilities. For example, Fehr and Schmidt (1999) assume that players focus on maximizing their own benefit but are at the same time averse to the advantageous (jealousy) and disadvantageous (guilt, inconvenience) inequalities between players. Because Fehr and Schmidt assume, without any proof, that the utility matrix has a metric structure, they think they are able to subtract advantageous and disadvantageous inequalities from a quantitative variable that they refer to as the utility.

Following Fehr and Schmidt we can design an experiment in which we model in a stylized manner a transaction without repeated direct contact between two persons (for example, on eBay). In this game we model an action-outcome structure with three possible outcomes. The first one is a successful interaction (exchange) which gives the test persons 50 euros each; this is the case if both persons are cooperative with regard to the agreement. The outcome of a non-successful transaction is 20 euros each. And the third possible outcome is the situation when one player cheats the other (to defect): the cheater gets 70 euros, the other player nothing (which is equal to 20 euros damage for the cheated person). The possible outcome matrix for this game (describing the mathematical structure of a Prisoner's Dilemma) is thus (see Matrix 1.1).

Fehr and Schmidt assume they can quantify utilities as follows:

(1) Actor x will be jealous (jealousy, J) when there is a disadvantageous inequality between x and another actor.
(2) Actor x will feel guilt (inconvenience, guilt, S) when there is advantageous inequality between x and the other.

In their deliberations Fehr and Schmidt assume that S and J are constants.

When S and J have a value of 0, they say we are dealing with a purely egoistic actor. Such an actor is unable to experience feelings of guilt or jealousy in social dilemma situations. Fehr and Schmidt speak of conditionally cooperative players when $S > 0$ and $J > 0$.

But the crucial question is how do Fehr and Schmidt quantify S and J? They assert that in the two-person game of Matrix 1.1, for both players when there is disadvantageous inequality, the utility for x is:

$U(x) = x - J (y - x)$.

According to Matrix 1.1, this is

$U(x) = x - J (70 - 0)$.

Now, Fehr and Schmidt suppose that $J = 0.5$. This changes the equation into:

$U(x) = x – 0.5 (70 - 0)$ which is:

$U(x) = 0 – 35 = -35$.

Doing the same for U(y) assuming that $S = 0.4$, we find

$U(y) = y - J (x - y)$.

According to Matrix 1.1, this is

$U(y) = y - J (0 - 70)$.

Now, Fehr and Schmidt suppose that $J = 0.5$. This changes the equation into:

$U(y) = y – 0.5 (0 - 70)$ which is:

$U(y) = 70 - 35 = 35$.

Fehr and Schmidt define $J = 0.5$ and $S = 0.4$ assuming that where there are unequal distributions, people have more disadvantage from jealousy than from feelings of guilt. Matrix 1.1 will then change and we will find the following values in the possible outcome matrix which describes an Assurance Game (see Matrix 1.2).

However, 70 euros cannot change into 28 euros due to feelings of guilt! We can thus conclude that it is impossible to assume a metric structure in a utility matrix like Fehr and Schmidt did. Subjective feelings of guilt or jealousy cannot and will not change possible outcome matrices. We therefore have to

Matrix 1.2 Possible outcome matrix of an Assurance Game

		Others (x)	
		Cooperate	Defect
Me (y)	Cooperate	50,50	35,28
	Defect	28,35	20,20

distinguish sharply between a possible outcome matrix which could be quantitative and utilities which are ordinal.

A numeric or quantitative possible outcome structure like Matrix 1.1 and 1.2 is the input for the actors' deliberation. Subsequently, an Assurance Game will be played if both players have the preference order (me, other): (C,C)>(D,C)>(D,D)>(C,D) and choose C. However, a Prisoner's Dilemma arises when both players have the preference order (D,C)>(C,C)>(D,D)>(C,D) and choose D.

Collective goods, egoism and strong reciprocity

If Agent A1 in neighbourhood N anticipates on choices of other agents, expecting that they will act according to the preference order (D,C)>(C,C)>(D,D)>(C,D) A1 does not necessarily have the same preference order, when A1 chooses also D. If A1 wants to choose C, but A1 believes that others will choose D, and A1 expects that others will also choose D, when A1's choice is D, A1 expects that others will always choose D and then its rational for A1 to choose also D. A1's preference order will change, when A1's mental representation of other agents' preference orders changes.

Agents strive for predictability so they can prepare themselves for interactions with other agents living around them. The next step is that agents want to control the things that they can manipulate. Often, control is only possible with joint action by a group of agents. This refers to the notion of collective goods. Shared space makes agents recognize their shared interests; for example, they have an interest in living in a safe and clean street where their children can play. That safe and clean street would then be a collective good. In that light, collective goods may be defined as the Objects O1,2,..n Agents A1,2,..n know in common and really want to manipulate, but only can bring under control together. For instance, if A1 doesn't want to invest time and effort in helping to clean up the street, but other agents do, A1 can profit from the collective good 'the clean street' without contributing anything. In so doing, A1 is a 'free rider' acting in short-term self-interest.

Reciprocity is about balancing one's own efforts with those of others in order to maintain a sense of fairness. Agent A1 is reciprocal if A1 thinks it is reasonable and wants to help others, but also applies this standard to actions of other agents towards himself. Over time, reciprocal agents develop a friendly attitude towards each other as a result of mutual assistance, not as its cause. Besides being a predisposition to cooperate with others, reciprocity is also a predisposition to verbally criticize or punish in another way (at personal cost, if necessary) those who violate the norms of cooperation (see Matrix 1.3).

Now we have agent Agent A1 who prefers, above all other options, a situation in which A1 and others sweep the street, but not A1 alone. This resident

Matrix 1.3 Formal form of Prisoner's Dilemma utility matrix

		Others	
		Cooperative	Egoistic
Me	Cooperative (C)	3,3	1,4
	Egoistic (E)	4,1	2,2

Assumption: (E,C)>(C,C)>(E,E)>(C,E)
The inequality 4>3>2>1 depicts the ordinal preference order of the players in a Prisoner's Dilemma.
(E,C) = choosing to act egoistically while others don't.
(C,C) = choosing to act from an altruistic or a reciprocal mentality when others do so too.
(E,E) = choosing to act egoistically when others do so too.
(C,E) = choosing to act from an altruistic or a reciprocal mentality while others act egoistically.

behaves as a strong reciprocator. When residents all decide to help clean the street, and thus behave as strong reciprocators, they play not a Prisoner's Dilemma but an Assurance Game or Trust Game. The formal structure of every Assurance Game is shown in Matrix 1.4.

Definition of the social climate of a residential neighbourhood

To refine the working definition of a residential social climate I have to assume that common knowledge exists. It was given a mathematical formulation in a set-theoretical framework by Robert Aumann (1976). A collective good is common knowledge if all of the agents know it (it is mutual knowledge) and all of the agents know that all other agents know it and all other agents know that all other agents know that all other agents know it, and so on. This is much more than simply saying that a collective good is known by all, since it implies that the fact that it is known is also known by all, etc.

Now that the theoretical framework has been presented, I can refine my working definition of a residential social climate. The revised definition reads as follows:

For any residential neighbourhood N the proportion G of well defined collective goods of all neighbourhood Objects O1,2,...nϵ ERS, is equal to the degree of viability of the social climate of the neighbourhood. Well defined means: (1) when common knowledge about the definitions of the collective goods exists among a significant subset of the residents of neighbourhood N; (2) when a significant subset of the residents of neighbourhood N intend to behave as strong reciprocators with regard to the collective goods; (3) when a significant subset of the residents of neighbourhood N agree on when and how to reciprocate in a negative or a positive way.

When the foregoing is the case in a sequential context like a residential neighbourhood, habituation occurs and an intermediary rule system develops.

Predictability, coordination game and some examples

Reciprocal agents want to participate in a joint action only if other agents participate too. One way to coordinate is simply to communicate a message such as 'Let's all participate in X'. But since each person will take part only if

Matrix 1.4 Formal form of an Assurance Game utility matrix with two Nash equilibriums (4,4 and 2,2)

		Others	
		Cooperative	Egoistic
Me	Cooperative (C)	4,4	1,3
	Egoistic (E)	3,1	2,2

Assumption: (C,C)>(E,C)>(E,E)>(C,E)
(C,C) = choosing to act from an altruistic or a reciprocal mentality when others do so too.
(E,C) = choosing to act egoistically while others don't.
(E,E) = choosing to act egoistically when others do so too.
(C,E) = choosing to act from an altruistic or a reciprocal mentality while others act from egoistically.

others do, for the message to be successful each person must not only know about the 'X' (the message); each person must know that each other person knows that each other person knows about it, and so on. That is, the 'let's participate in X' must be 'common knowledge'. (Chwe, 2000). In their efforts to coordinate repeated actions in the semi-public and public areas, residents are aware of the circumstance that most of the state of affairs in a neighbourhood is unknown and that the known facts are often not easy to manipulate. In order to prepare oneself, a resident wants to be able to predict as much as possible what will happen. In game-theoretical terms, equilibrium in coordination game creates 'predictability'. To create predictability they need certain conventions that guarantee a minimum of predictable behaviour. The following is an example of a coordination game:

Residents, when passing me in the street or passing each other, want either the situation in which they are greeted and will greet back or the situation in which both do not greet each other. They avoid the situation in which one resident greets while the other doesn't. By looking at each other's face the two passers-by estimate what the other will do: the other will greet or will not greet.

A situation in which one of the two greets and the other does not is experienced as unpleasant or even embarrassing. It is not so much the 'content' of the action that is important; rather, the coordination within the action is important. In short, it is the coordination of the action that counts. In their efforts to coordinate repeated actions in the semi-public and public areas, residents are aware of the circumstance that most of the state of affairs in a neighbourhood is unknown and that the known facts are often not easy to manipulate. In order to prepare oneself, a resident wants to be able to predict as much as possible what will happen. He does this for example, by demonstrating benevolence and pro-sociality when being asked the direction to a certain place by someone that comes across in the street. Empirical regularities will become 'unwritten rules' when there is equilibrium in a coordination game.

Controllability

During their repeated interactions in the shared semi-public and public areas in the living environment, and by the physical tracks of earlier actions that

cover the streets and walls of their dwellings, residents demonstrate the way they keep up the appearance of their house and garden and the gallery and how they handle their garbage. This state of affairs is more than 'predictability' in a coordination game. What is strived for here is controllability. A viable social climate in a residential environment or a micro-neighbourhood is not simply about the distribution of more-or-less unwritten rules of conduct; it also lets each resident know that other co-residents know, and so on. Common knowledge depends not only on me knowing that you receive a message, but also on the existence of a shared symbolic system which allows me to know how you understand it. Here we can determine a second aspect or variation of common knowledge that is generated not only by communication but also by historical precedent. The type of common knowledge mentioned here not only helps a group coordinate, but also to some extent can create groups, collective identities, 'imagined communities' in which, for example, each newspaper reader is aware of millions of fellow-readers (Chwe, 2001).

Anonymity, subtle communication strategies and distrust

Common knowledge about in-group rules is generated by patterns and repetition that is recognized by individuals. 'Solving' free-rider problems that occur in a Prisoner's Dilemma situation thus requires expanding the range of people's motivations. For example, legal or social sanctions can be imposed on free riders or repeated contexts in which engaging in free-riding now might make people unwilling to cooperate with you later (Suk-Young Chwe, 2001).

The social environment moves between anonymity and community. Anonymity can have either a positive connotation or a negative one. Positive anonymity is a quality of urban life, expressed in terms of 'freedom'. For example, cities are associated with the freedom to adopt another social identity, for instance that of a dog-owner. Anonymity is not a problem as long as it is based on a person's free will in choosing to be anonymous (Altman, 1975). But people who occupy mid-rise and high-rise buildings live close together in large numbers in a relatively small area with several shared spaces. As a consequence, they regularly experience coincidental encounters with more-or-less anonymous co-residents. They are forced to interact, simply because they cannot avoid one another. A sense of insecurity about the actions of those (unknown) others in this type of residential area can easily occur. This is even more likely when collective goods are involved. In the first place, it is hard to address a certain 'message' to a norm offender, because you simply do not know who did it. Secondly, when you know to whom the 'message' (i.e. a complaint or request) can be addressed, you can still be insecure about the response that can be expected: "Will he apologize and obey the rule, or will he get angry or even aggressive?" In short, negative anonymity can hinder predictability and thus hinder controllability. That the physical environment can support the control over social interaction or hinder it is illustrated by the

following example of a woman (aged 82, living in the neighbourhood for 20 years):

> "It is... yes... the contacts of the flats mutually... yes they are situated, and that makes really a difference, they are all situated with the backs towards each other. That is of course great because, there is the south and there is the balcony, but there is the 'sleeping side'. There you never see anyone; there is no balcony or something. And that is of course different in older neighbourhoods like Amsterdam-Zuid. There the dwellings are facing each other, and therefore you get a completely different 'street-feeling', and that is missing here. You step out of your door and every other person that steps out of the door... I don't have a notion of where they live. (...) So you hardly have here... I definitely don't know who lives next to me, definitely not. And at the other side either; I don't know anyone in the street."

Anonymity can be the starting point of a downward spiral that leads to neighbourhood decline. It is relevant to refer here to the Broken Window Theory (Wilson-Kelling hypothesis; in: McLaughlin *et al.,* 2003). This thesis suggests that neighbourhood disorder is indicated by visible cues that residents perceive to be signs of the breakdown of social order and control (Wilson & Kelling, 1982; Ross and Mirowsky, 1999; Skogan, 1990). Skogan calls this the contagiousness of the problem of disorder: "To the extent to which disorder becomes self-generative and feeds on itself, current levels of disorder produce future levels of disorder" (Skogan, 1990, p. 49). This may cause neighbourhoods to decay and the quality of life of its inhabitants to deteriorate (Skogan, 1990).

As recent empirical research in the Netherlands has demonstrated, when people observe that others have violated a certain norm or legitimate rule, they themselves are more likely to violate it and even other norms or rules, which causes disorder to spread (Keizer *et al.,* 2008). Thus, visible physical and social disruption is a signal that the mechanisms by which healthy neighbourhoods maintain themselves have broken down. If an area loses its capacity to solve even seemingly minor problems, its character becomes suspect. Residents are thought to read nuisance as a sign of disorder and as evidence of a deeper neighbourhood malaise, undermining personal health and trust (see Sampson & Raudenbush, 2004).

Thus, a completely anonymous living environment is, apart from the individual preferences, socially undesirable because there are no boundaries for antisocial behaviour (Zimbardo, 1969). In the following quotation, a lady, aged 67 who has lived with her husband in Buitenveldert for 11 years in a social rental apartment, expresses how the Broken Window Theory works in practice:

> Lady: "The garbage containers are emptied regularly; I don't have any complaints about

that. And yes the people can of course not come every hour to remove the stuff. The people do it often on Friday afternoon and then they throw mess next to the dirt container. But then you cannot throw stuff in the container, 'Then wait till Monday'."
Interviewer: "Does it influence the behaviour of other residents?"
Lady: "Yes I think so. You see, as soon as something is dirty – consider yourself, then you think 'What does it matter, throw it also there'. Yes that is how it works. When garbage is put outside the container... when someone comes and sees that there is no garbage, then he will take it back to the house thinking 'I can't do this now'. But when there ís already dirt outside the container, then he will throw it also there; that is how it works..."

Newman had already found out that readable territories make it possible to control the social and physical environment because they facilitate surveillance (Newman, 1972). Another way of exercising control over the physical environment is by making it more personal. A personalized environment is no longer anonymous and signals the message 'being owned by' and/or 'being cared for'. Thus, in a situation where people hardly know their neighbours, various cues – graffiti on the wall, dirt in the doorway, a supermarket trolley on the gallery, a radio that is switched on too loud, and other 'negative externalities' – are 'read' to value the disposition of the neighbours (Adriaanse, 2011). And the more fundamental coordination game becomes a problem: people's actions become unpredictable.

Game theory in qualitative empirical science

The mathematical structure of games can be applied in observations of daily face-to-face interactions, as Goffman does in his book *Strategic Interaction* (1969). Fundamental notions in his application of game theory are reflexive choice, anticipation and situation. Game theory, in Goffman's view, sheds light on an area of social life that sociology has more or less missed. It identifies situations in which actors are mutually aware of each other, where every move that someone makes affects all the actors, and where the decision that Actor A makes depends on what Actor B thinks that she will do (Swedberg, 2001). Goffman distinguishes three moves which are the basic elements of interaction situations. The first is the *unwitting move*, whereby the person acts without giving a thought to impression management (Goffman, 1969, p. 17). Impression management occurs when a person makes use of the observer's use of his behaviour before the observer has a chance to do so (Goffman, 1969, p. 13). The second is the *naïve move*, whereby the observer draws information from what he takes to be an *unwitting move.* Thirdly, he defines the *covering move*, through which the subject attempts to influence the conclusions that the observer draws. In the fourth move, Goffman states, the observer is suspecting that what he might have treated as an unwitting move is actually or possibly an obfuscation or misinterpretation, suspecting that what appears to be ingenuous fact could be shot through and through with

a gamesman's manipulation and design, suspecting this we can attempt to crack, pierce, penetrate, and otherwise get behind the apparent facts in order to uncover the real ones. The observer performs an *uncovering move* (Goffman, 1969, p. 17, 18).

Here Goffman points to a system of rules that has to be internalized to some degree to make way for politeness and altruistic punishment. One of the attributes about yourself that you want to communicate to others – to people with whom you have longer-lasting relationships – is that you know of the existence of the intermediary rule system, that you know how to practise it and that at least you respect it. Goffman refers to this reality as an expression game.[6]

1.3 Research questions and structure of the thesis

The thesis starts from the perspective of the residents, eliciting their definition and perception of the success of their neighbourhood. Early post-Second World War neighbourhoods are called neighbourhoods of a vulnerable physical, spatial type by scholars and other professionals. But do the subjective perceptions of residents living in these neighbourhoods correlate with these professional opinions?[7] The conceptual model (see Figure 1.3) depicts the main concepts of the thesis in their mutual relationship.

This research has a cross-sectional and non-experimental design. Because of limitations on time and money the research project includes no longitudinal research. Therefore the best I could do was to develop reliable and valid questionnaires and to conduct a detailed case study in one (relatively) unproblematic neighbourhood, in order to make it plausible that the model is describing important and relevant variables.

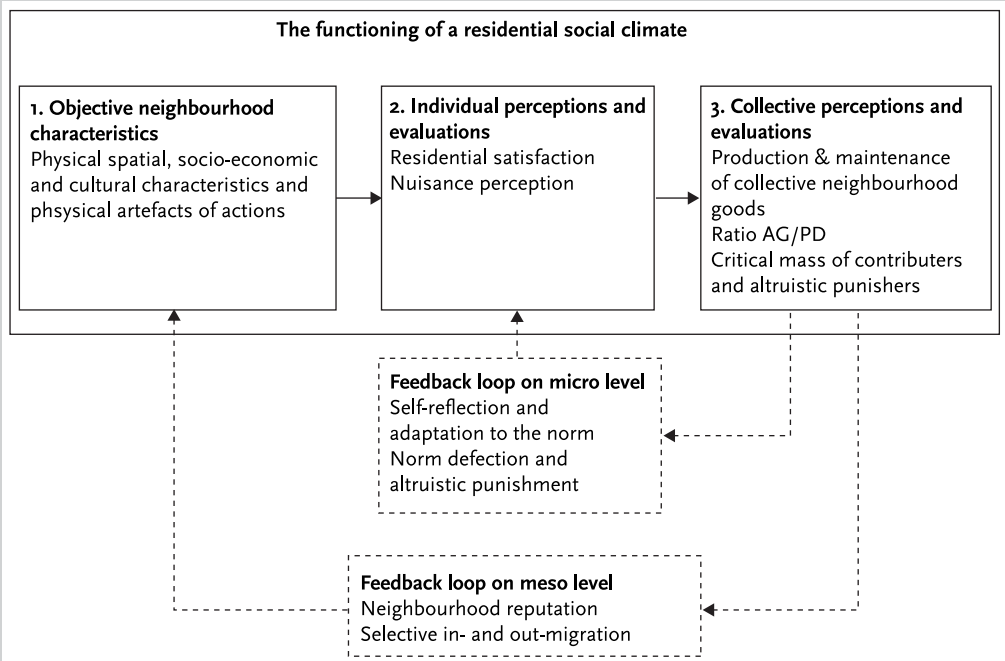
1.3.1 First research question

The research project started with the construction of a quantitative database that contained objective register data for all Dutch neighbourhoods and survey data from the Dutch Housing Demand Survey (WoningBehoefteOnderzoek, 2002), a random sample of 75,034 respondents that is representative for the population of Dutch residents in 2002. The Housing Demand Survey is one

6 What Goffman in 1969 could not know yet is that his description of an expression game perfectly fits the definition of what later was called a signalling game by Spiezer who in 1972 received the Nobel Prize for his work.

7 Also stakeholders like shop owners, (managers of) housing corporations, the police and welfare institutions have an important role in the development and maintenance of neighbourhoods, nevertheless I focus on the perception and role of the residents for this thesis.

Figure 1.3 Conceptual model with main concepts of the thesis



of the most extensive sample surveys in the Netherlands and was held every four years and its successor WOON is held every three years.

The first research question is split into a methodological and an empirical subquestion:

1a How can neighbourhood success be measured with scale instruments?
1b Which factors contribute to a problem-free or problematic functioning of neighbourhoods in general and especially of early post-Second World War neighbourhoods in the Netherlands?

The first research question is answered in the second, the third and the fourth chapter of this book. In the second chapter an integrative and more comprehensive approach to the measurement of residential environmental satisfaction (see Boxes 3 and 1 of the conceptual model) will be introduced. Domains of residential environmental satisfaction will be empirically examined using techniques for multivariate analysis. Exploratory factor analysis is used to find out if empirical support can be found for the usefulness of the theoretically proposed three-component model of residential environmental satisfaction. Three separate domains of success are distinguished. First, the resident's dwelling is perceived as appropriate. Second, the social climate in the neighbourhood is perceived as positive. Third, the internal reputation of the neighbourhood is evaluated in a positive way. By pattern detection in satisfaction severity groups, it will be indicated which subdomain is the most significant component of overall residential satisfaction.

The main objective of the third chapter is to introduce a comprehensive approach for measuring the frequency of perceived nuisance in the residential environment (see Box 3 of the conceptual model). To that end, it presents some preliminary subgroup analyses investigating whether subsets of residents rate nuisance differently. A residential nuisance scale is empirically tested using multivariate analysis. Exploratory factor analysis will be used to determine whether empirical support can be found for the claim that the proposed model of reported frequency of residential nuisance is useful. Confirmation of the adequacy of the Residential Nuisance Scale – Dutch Language Version (RNS-DLV) is sought in reliability and validity tests to find out if it correlates as expected with various criterion measures.

The fourth chapter builds upon results described in Chapters 2 and 3 to investigate the relationship between physical-spatial, demographic and economic risk factors, and nuisance and environmental (dis)satisfaction. Two conceptual models are tested in multivariate analyses (zero- and partial-order correlations). The goal is to investigate whether human-derived nuisance in the residential environment is an important source of residential environmental dissatisfaction. The parameters used for the Risk Scale identify variables on the meso level of the neighbourhood. Resident's opinions and risk factors will be described on the average neighbourhood level. As such, this chapter deals with Boxes 1, 2 and 3 of the conceptual model and the relationships that are assumed between them.

1.3.2 Second research question

The foregoing theoretical and empirical notions and considerations led to the second main research question of the thesis, which mainly concerns the case-study area of Buitenveldert. Research question 2 is split into a theoretical and an empirical part. The theoretical subquestion is:

2.1 Can central concepts of behavioural game theory describe and explain the proximate causes of a viable residential social climate?

The empirical subquestion is:

2.2 What mediates the residents' willingness to contribute or not to the production and maintenance of collective residential goods?

The fifth and sixth chapters concern the strong dependency of a neighbourhood's viability on the willingness of its residents to intervene (Box 2 and its feedback loop on the micro level). As will be described in Chapter 2, residential environmental satisfaction is expressed not only as satisfaction with the dwelling or in the internal neighbourhood reputation. Rather, it is mainly re-

vealed by people's evaluation of the social climate prevailing in their neighbourhood. The game-theoretical framework developed in Chapter 1 is used for analysing the role of trust and altruistic punishment in the production and maintenance of collective neighbourhood goods in the case-study area Buitenveldert-Amsterdam. The central theoretical concepts are 'social dilemmas', 'trust', 'communication' and 'verbal sanctioning' as a specification of the concept of 'altruistic punishment'. The results indicate that mutual trust built up by communication including verbal sanctioning is an essential aspect of solving collective action problems in a neighbourhood context. Chapter 7 concludes the thesis by bringing together the key findings of the previous chapters and answering the research questions of the study. The final section offers some recommendations for policy and practice.

1.3.3 Some notes on the approach of the research

As we have seen in the theoretical section, I shall expand on behavioural game theory in this thesis. To that end, I adopt a framework in which reflexive choice and anticipation are crucial ingredients. In this section I try to justify this approach. From a social-ontological perspective we can distinguish between reflexive choice and pre-reflexive behaviour. In this thesis I do not focus on pre-reflexive behaviour. If a researcher wants to study pre-reflexive human behaviour, he has to make a field visit to a study 'site'. He may consider taking photographs at the site or may assume a specific role and actually participate in the events being studied there.

I wanted to study intentional human behaviour, or more precisely, the intentional and goal-oriented behaviour of residents. Intentional human action is caused by desires and beliefs. Residents can give an indication of their desires and beliefs in a survey questionnaire. Now, from an ontological perspective, one particular class of reflexive behaviour is called 'practising science'. Reflexive behaviour is always analytical; therefore, practising science as 'being involved in a reflexive mode of being' is by definition analytical. Indeed, science is always an analytical, rational, cognitive enterprise.

Subsequently we can distinguish between the instrumental and the scientific task of analysis. The instrumental task amounts to the specification of an empirical procedure enabling any person to distinguish between cases within a specified domain where the concept can be applied, on the one hand, from cases to which the scientific concept cannot be applied, on the other hand. The instrumental task is preceded by a logical investigation to ascertain that an attribute has a logically independent existence and by an empirical investigation to determine that an attribute is quantitative. Thus, speaking coherently about a state of affairs does not qualify as a scientific activity. A gathering of well educated, wide-awake adults discussing a relevant social state of affairs can develop a rich and imaginative vocabulary with

which they can label and loosely describe elements of an empirical domain. But this cannot be qualified as science; it lacks a logical and empirical investigation into the 'inner structure' of the concepts used. By calling a rich and imaginative vocabulary 'science', one would be committing the social-science fallacy, namely: 'We agree that this sounds so beautiful that it must be true.' Jon Elster also mentions social-scientific concepts for which no empirical procedure in our sense is given. He states that at best these are useless and harmless metaphors; at worst, they open fruitless avenues of research and suggest false causal hypotheses (Elster, 2007, p. 455). As an example, Elster mentions the ideas of 'cultural capital' (Bourdieu, 1984) and 'social capital' (Putnam, 2000). The scientific empirical concepts describe properties of objects but also the relation between properties. A scientist is especially interested in those functional relationships between properties known as causal explanations. A special class of causal explanations that I would like to mention is called 'abduction'.

Abduction

In logic, three kinds of logical reasoning can be distinguished: deduction, induction and abduction. Given a precondition, a conclusion, and a rule that the precondition implies the conclusion, they can be explained in the following way. Deduction means determining the conclusion. It is using the rule and its precondition to draw a conclusion. Example: "When it rains, the grass gets wet. It rained. Therefore, the grass is wet." Induction means determining the rule. It is learning the rule after numerous examples of the conclusion following the precondition. Example: "The grass has been wet every time it has rained. Therefore, when it rains, the grass gets wet." Abduction means determining the precondition. It is using the conclusion and the rule to support that the precondition could explain the conclusion. Example: "When it rains, the grass gets wet. The grass is wet, therefore, it may have rained."

In the part of the thesis that seeks to answer the second research question, the term abduction is used to capture the kind of logical reasoning in play. Charles Sanders Peirce defined abduction as qualitative induction or hypothesis. Later he called this way of reasoning abduction or retro-duction (Niiniluoto, 1999). In both induction and abduction, reasoning jumps from the specific to the general, but there is a difference. With induction, we generalize from several cases of a type for which we know something is true. Thus, we assume that this conclusion applies to all members of the group. With abduction, in contrast, we find a surprising fact that could be explained by assuming that it is a special case of a general rule. Therefore, we take that assumption to be the truth (Schuyt, 1995, p. 85, 86). Stated formally, the term abduction refers to the process of arriving at an explanation a from an observed surprising circumstance b. To abduct explanation a from a surprising circumstance b is to surmise that a may be true because then b would be a matter of course. Thus,

to abduct a from b involves determining that a is a sufficient but not necessary condition for b. Abduction is in fact causal reasoning. For example, the absence of liveability problems in a neighbourhood of a vulnerable neighbourhood type such as Buitenveldert (b) can be explained by the prevalence of a viable social climate (a). The viable social climate is a sufficient but not necessary condition of the absence of liveability problems. The surprising circumstance is that there are no liveability problems in terms of graffiti, reported vandalism and unsafety. But if there is a viable social climate in terms of well defined collective neighbourhood goods, then it would be unsurprising that there are no liveability problems. This is good abductive reasoning from social climate to liveability problems. It involves not simply a determination that the presence of well defined collective goods is sufficient for the absence of liveability problems. It also implies that well defined collective goods are among the most economical explanations for the lack of liveability problems. Simplification and economy are what call for the 'leap' of abduction.

Now that the theoretical framework has been presented, I can refine my working definition of a residential social climate. The revised definition reads as follows:

For any residential neighbourhood N the finite set G of well defined collective goods has a cardinality which is identical to the degree of viability of the social climate of the neighbourhood. Well defined means: (1) when common knowledge about the definitions of the collective goods exists among a significant subset of the residents of neighbourhood N; (2) when a significant subset of the residents of neighbourhood N intend to behave as strong reciprocators with regard to the collective goods; (3) when a significant subset of the residents of neighbourhood N agree on when and how to reciprocate in a negative or a positive way.

When the foregoing is the case in a sequential context like a residential neighbourhood, habituation occurs and an intermediary rule system develops. Having the tendency to do the same things that one has always done is often pre-reflexive. But pre-reflexive habitual behaviour can be made reflexive by asking respondents about it in a survey or interview, as I have done for this thesis.

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2 Measuring residential satisfaction: a residential environmental satisfaction scale (RESS)

C.C.M. Adriaanse, Journal of Housing and the Built Environment (2007) 22, pp.287-304, Springer Science+Business Media.

Abstract
The aim of this article is to introduce an integrative and more comprehensive approach to measurement of residential environmental satisfaction. Domains of residential environmental satisfaction were empirically examined using techniques for multivariate analysis. Data were mainly drawn from the Housing Demand Survey (WoningBehoefteOnderzoek 2002), an a-select sample of 75,034 respondents that is representative for the population of Dutch residents in 2002. The Housing Demand Survey is one of the most extensive sample surveys in the Netherlands and is held every 4 years. The results of exploratory factor analysis give empirical support for the usefulness of the theoretically proposed three-component model of residential environmental satisfaction. Furthermore, multi-group analysis supports the assumption of similarity of perceived quality of the living situation among people varying in degree of residential environmental satisfaction. Reliability and validity tests confirm that the Residential Environmental Satisfaction Scale-Dutch Language Version (RESS-DLV) is an adequate instrument and that it contributes to the understanding of the perceived quality of the living situation. The measure correlates as expected with various criterion measures. The compact and valid instrument RESS-DLV – and especially its abbreviated version – can be very useful as the dependent or the independent variable in research carried out in the Netherlands and other European countries. First pattern detection in satisfaction severity groups indicates that satisfaction with the subdomain 'residential social climate' is the most significant component of overall residential satisfaction.

Keywords
Residential environmental satisfaction, multidimensional outcome measure, residential social climate, reliability

2.1 Introduction

A recent trend in policy-oriented urban research is to make an inventory of problems at the local level and then classify neighborhoods along those lines. Local and national government can then use the results to hammer out urban regeneration policies. These neighborhood profiles are generally derived from objective measures and socio-demographic predictors of dysfunction and dis-

satisfaction (RIGO, 1995; http://www.communities.gov.uk). While moving in a promising direction, the research has run into some conceptual challenges. One of these involves the construction of indicators. They consist of social and physical variables as well as objective and subjective data. Due to their composite nature, the indicators combine the underlying causes of neighborhood decline with its diverse manifestations.

Progress has been made, especially in analyzing the issues, formulating policy, refining the definitions, and classifying the problems. Nonetheless, stakeholders frequently take too narrow a focus in their approach to declining neighborhoods (see Buys, 2002). Countless policy programs define neighborhoods as 'problematic' on the basis of their external appearance. They are characterized by a specific urban planning structure and the predominance of certain housing types (Kruythoff & Haars, 2002). Yet not every older mid-rise area should be cast as a problem neighborhood. Look at the statistics. The outliers show that neighborhoods with the same initial urban planning structure can develop in a completely different direction. Thus, one may end up in the 'problem' category while another will not. These neighborhoods got off to an equal start as potential environments. Over time, differences in use and management imbued them with very different capacities to become effective environments (Gans, 1968; Van der Horst *et al.*, 2002). Some of the key explanatory factors lie in the spheres of interpretation, social structure of the environment, management, and use of the neighborhood by its residents (Blokland-Potters, 1998; Ministerie van VROM, 2004). These factors are critical to an understanding of why one area turns into a problem neighborhood while another does not, even though they are both of the same urban planning type.

Residents' opinions about their neighborhood offer important insights. They shed light on which aspects of the setting have a greater impact on overall residential environmental satisfaction. This line of reasoning was set forth long ago by Herbert Gans, who stated that "The effective environment may thus be defined as that version of the potential environment that is manifestly or latently adopted by users" (Gans, 1968, p. 8). This definition has since been operationalized by Diener and Suh (1997). They say that to understand the well-being of an individual, one must measure the person's emotional and cognitive reactions to his/her environment. Taking their cue, the present study focuses on the perspective of the residents. Data was collected on their perception of how successful their neighborhood was. The research described in this article explored the relationship between the individual and the environment at the neighborhood level.

First of all, this article describes the development and validation of a multidimensional outcome measure for residential environmental satisfaction. This measure could serve as the dependent or as the independent variable in future research models. Ultimately, these models should elucidate whether subsets of residents tend to use different standards for evaluating their resi-

dential environment.

Furthermore, they might reveal which neighborhood characteristics have a positive influence on residential satisfaction and which do not. Thus far, few studies have explored how attributes of the residential environment influence residential satisfaction. In the absence of selection criteria, the research has been based on mere lists of physical and social neighborhood characteristics that influence residential satisfaction. For instance, the literature reports on traffic noise, the presence of green space and services, the proximity of social relations, and nuisance such as rubbish (Van Poll, 1997; Bonaiuto *et al.*, 1999). But little is known about the interactions between these features.

Second, this article considers the extent to which overall residential satisfaction is explained by the three components of the residential environment distinguished by Canter and Rees (1982), namely neighborhood, house, and neighbors. Thus far, little is known about the mutual interaction of these components. The insights emanating from the analysis may help housing associations – as well as other stakeholders that are developing urban, housing, and neighborhood renewal policy – find the right policy mix to improve overall quality of life.

The following section (2.2) presents the theoretical framework, and Section 2.3 describes the data and methods used. Section 2.4 expands on the Residential Environmental Satisfaction Scale – Dutch Language Version (RESS-DLV) and its shorter version (the abbreviated RESS-DLV). Both are based on the data of the Dutch national housing sample Housing Demand Survey 2002. Section 2.5 summarizes the initial outcomes of the multivariate analyses that were performed to determine which of the three subdomains dominates overall satisfaction. The concluding section (2.6) contains a discussion, policy recommendations, and suggestions for further research.

2.2 Residential environmental satisfaction: state of the art

Certain types of neighborhoods are considered more problematic than others due to their physical characteristics. Residential environments can be typified by objective criteria such as building period, architectural style, spatial structure, amount of green space, and geographic location. The allocation of neighborhood characteristics is not generally disputed. But there are differences in the way residents perceive and use their environments.

The 'iron variables' of household composition, income, and age are generally set off against housing characteristics and the physical characteristics of the neighbourhood type. The relations this reveals are used to explain differences in residential satisfaction. But this standard approach has recently been questioned. Apparently, residents evaluate their living environment on

the grounds of soft criteria too. Consequently, residents with a similar household composition may evaluate their living environment differently (Karsten *et al.,* 2006). A focus on objective person – environment relations or objective neighborhood characteristics gives only a limited perspective on the determinants of residential environmental satisfaction. Though fundamental to any understanding of location preferences, this narrow perspective excludes the experiential dimension of housing (Altman & Low, 1992). Over time, people develop a sense of 'dwelling' or 'being in place'. Their habitual routines build up a cognitive awareness of the residential environment to the point that a person becomes psychologically fused with it.

Galster and Hesser assert that, "Given a set of felt needs and aspirations, an individual evaluates his or her current housing situation with regard to both the dwelling unit and neighborhood." Those needs and aspirations are comprised of individual characteristics (e.g., social class, life cycle stage) and cultural norms (Galster & Hesser, 1981, p. 737). Taking this as a point of departure, the outcome of an instrument like the RESS-DLV (described in this article) may be expected to differ by the type of resident. At a higher level of aggregation, the outcome may be expected to differ among countries as a consequence of specific housing-market characteristics and socio-cultural traditions.

The empirical studies dealing with residential satisfaction take one of two approaches (Weidemann & Anderson, 1985). Some (e.g., Speare, 1974; Newman & Duncan, 1979) consider residential satisfaction as a predictor of behavior. It can predict behavior such as moving house or home improvement (Priemus, 1986). This approach assumes that any incongruence between the set of needs and aspirations and the current residential status can be alleviated either by moving or making adjustments to the current unit or location (Galster, 1987a; Wolpert, 1984). Accordingly, studies dealing with residential mobility and its consequences use residential satisfaction as a predictor of moving/coping behavior.

The other approach uses residential satisfaction as a criterion of residential quality (Marans & Rodgers, 1975; Galster & Hesser, 1981; Bonaiuto *et al.,* 1999; Amérigo & Aragonés, 1990, 1997; Parkes *et al.,* 2002; Pinquart & Burmedi, 2004). The researchers seek to establish the factors – both those of the residential environment and those of the individual – that determine the degree to which a person is satisfied with his or her residential environment. Factors such as length of residence, tenure status, the physical characteristics of the house and neighborhood, social bonds, and the socio-demographic characteristics of residents are said to affect satisfaction levels (Galster & Hesser, 1981). A new direction within this approach started with the study of housing satisfaction by Canter and Rees (1982). They used multi-dimensional scaling and developed a general model of housing satisfaction that places user goals at the center of the evaluation of the residential environment. They argue that

user assessment should form the cornerstone for evaluation research and that 'feedback' or 'appraisal' is integral to the design process (Canter & Rees, 1982, p. 185, 186).

Some investigators use a single-item measure of satisfaction with housing conditions. Hadden and Leger (1990, p. 31), for example, asked "Is this neighborhood better, worse, or about the same as your last neighborhood?" Others consider this measure too coarse to represent the full range of residential satisfaction (e.g. Pinquart & Burmedi, 2004). Many surveys ask which qualities people associate with a good housing environment and most surveys are presented to a random sample of residents. The typical procedure is to prepare a list of potentially desirable qualities such as 'convenient public transport' or 'a friendly place'. The residents are supposed to indicate whether or not they appreciate these features and to express their opinion by using a rating scale. The scale they are given may elicit priorities (How important is it for a neighborhood to have each of the following qualities?) or degree of satisfaction (How satisfied are you with your present neighborhood?).

Numerous empirical studies have examined characteristics of the users (either cognitive or behavioral) or of the environment, both physical and social. But few have organized these variables in a model in an effort to facilitate analysis of the relationships among these characteristics (Parkes *et al.*, 2002). Amérigo and Aragonés (1990, 1997) and Amérigo (2002) state that once the objective attributes of the residential environment have been evaluated, they become subjective. At that point, these attributes give rise to a certain degree of satisfaction. Naturally, subjective attributes are influenced by 'personal characteristics', which include one's socio-demographic profile. But subjective attributes are also influenced by one's 'residential quality pattern'. This brings a normative element into the picture, since the individual is asked to compare his/her real and ideal residential environments. The result of this evaluation constitutes a measure of residential satisfaction. It is defined as a positive affective state that the individual experiences towards his/her residential environment and that will cause him/her to behave in certain ways in order to maintain or increase congruence with that environment.

A case in point is a study aimed at deriving the predictors of residential satisfaction in public housing of the city of Madrid (a study conducted by Amérigo *et al.*). The results show that psycho-social aspects such as relationships with neighbors and the degree of attachment to the residential environment are stronger predictors than physical features such as infrastructure and equipment of the house and neighborhood (Amérigo & Aragonés, 1990, p. 323). Other researchers (Canter & Rees, 1982) established a working model to measure perceived residential quality. Their model distinguishes three essential elements of the residential environment: the neighborhood, the house, and the neighbors (Canter & Rees, 1982, p. 190-192).

The notion of 'residential environmental satisfaction' in the present article

is taken as a global attitude of a resident (or a household) towards the living environment. The following sections represent an attempt to use the theoretical insights mentioned above to develop an outcome measure for the purpose of evaluating residential environmental satisfaction. First the data and method are described.

2.3 Data and methods

The analysis is based on Dutch survey and registry data. The results of the 2002 national housing survey (Housing Demand Survey 2002) were used along with data on the characteristics of the Dutch housing stock at the zip-code level. The latter were derived from the *Woningmarktmonitor* (ABF, 2003) and the Wegener data file (2002). The *Housing Demand Survey 2002* comprises an a-select sample of 75,034 respondents. The sample is representative for the population of the Netherlands in 2002. The Housing Demand Survey, which is the successor of the general census of housing and population, has been held every 4 years since 1964. The results are used to develop government policy. The Housing Demand Survey provides information about household composition, housing situations, affordability, demand, and residential mobility. The survey includes questions on how residents feel about their living situation: about their evaluation of the current dwelling, their contacts with neighbors, and the appearance of the neighborhood. The theoretical insights mentioned above provided a framework for the initial selection of variables from the questionnaire of the Housing Demand Survey. The selection criteria were refined in light of the present author's own research in two mid-rise neighborhoods in Amsterdam and The Hague (Adriaanse, 2004a, b). That research yielded insight into the factors contributing to the success of the neighborhoods from the residents' point of view. The factors they identified referred to physical and spatial characteristics of their neighborhood as well as to its socio-cultural attributes.

Table 2.1 gives an overview of the Housing Demand Survey variables (translated from Dutch) that were selected for the analyses. Those questions that posed an undesirable situation – the ones with an * – were later recoded in order to use them in subsequent multivariate analyses.

Residents had to give an answer in one of the following two forms: either 'Do you agree with the following statements?' or 'How satisfied are you with…?' The respondents were asked to choose their answer from a five-point Likert scale (1-5) that was constructed as follows for the first form: (1) strongly agree; (2) agree; (3) neither agree nor disagree; (4) disagree; (5) strongly disagree. For the second form, the scale was as follows: (1) very satisfied; (2) satisfied; (3) neither satisfied nor dissatisfied; (4) dissatisfied; (5) very dissatisfied.

Table 2.1 The 18 Housing Demand Survey items used in the analysis

1. I am satisfied with my dwelling
2. The layout of this dwelling is convenient
3. The dwelling is poorly maintained*
4. The dwelling has a pleasing ambience
5. The dwelling has enough outdoor space (balcony, garden)
6. I am satisfied with my living environment
7. The buildings in this neighborhood are attractive
8. Living in this neighborhood is annoying*
9. I feel an urge to move out of this neighborhood*
10. I feel attached to this neighborhood
11. I feel at home in this neighborhood
12. I have a lot of contact with my neighbors
13. I have a lot of contact with other residents in my neighborhood
14. I feel co-responsible for the livability in this neighborhood
15. In this neighborhood residents treat each other pleasantly
16. I live in a cozy neighborhood with a lot of cohesion
17. People in this neighborhood hardly know each other*
18. I am satisfied with the social mix of the neighborhood population

* These questions posed an undesirable situation and were recoded in order to use them in subsequent multivariate analyses.

2.4 Development of the residential environmental satisfaction scale

Explorative factor analysis was used to develop the Residential Environmental Satisfaction Scale – Dutch Language Version (RESS-DLV). Before conducting that factor analysis, though, the inter-item correlation matrix of the 18 Housing Demand Survey items listed in Table 2.1 were carefully examined. The correlation of 'The dwelling has enough outdoor space' with all other RESS items was between 0.09 and 0.28. The correlation of 'I feel co-responsible for the liveability in this neighborhood' with all other RESS items was between 0.09 and 0.24. Because the correlation of these items with all the other items is low, it was decided to exclude these two items from further analysis.

The remaining 16 Housing Demand Survey questions were used in an unforced exploratory factor analysis with Varimax rotation. The factor analysis resulted in three factors; see Table 2.2 for the rotated factor loadings.

Together the three factors accounted for 52% of the variance. The three factors (domains) were inspected and defined as described below.

Factor 1 can be interpreted as the residents' general opinions and feelings about living in the neighborhood. It represents their experience of the physical environment and the population characteristics. This factor is therefore labelled 'internal neighborhood reputation' (see for example Suttles, 1972; Reitzes, 1983; Wacquant, 1993; Hortulanus, 1995). The value attached to a neighborhood is expressed in both internal and external image-forming processes. The perception of the general public and the opinions of stakeholders make up the neighborhood's external reputation; the image that the residents have is its internal reputation.

Factor 2 is labeled 'social climate'. The social climate of a residential envi-

Table 2.2 Rotated Component Matrix

	Component 1	Component 2	Component 3
1. I feel at home in this neighborhood	.732		
2. I am satisfied with my living environment	.727		
3. Living in this neighborhood is not annoying*	.718		
4. I am satisfied with the social mix of the neighborhood population	.647		
5. I don't feel an urge to move out of this neighborhood*	.588		
6. The buildings of this neighborhood are attractive	.539		
7. In this neighborhood residents treat each other pleasantly	.528		
8. I feel attached to this neighborhood	.511		
9. I have a lot of contact with other residents in my neighborhood		.816	
10. I have a lot of contact with my neighbors		.764	
11. I live in a cozy neighborhood with a lot of cohesion		.666	
12. People in this neighborhood tend not to know each other*		.634	
13. I am satisfied with my dwelling			.732
14. The layout of this dwelling is convenient			.689
15. The dwelling has a pleasing ambience			.676
16. The dwelling is properly maintained*			.652

* These questions posed an undesirable situation and were recoded in order to use them in subsequent multivariate analyses.
Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in six iterations.

ronment is an individual's perception of how others treat him or her, one another, and the spatial artefacts within the area that the individual experiences as his or her living environment (Adriaanse, 2005). Factor 3 is labeled 'dwelling satisfaction'.

2.4.1 Reliability

Reliability is the most fundamental aspect of sociological measurement. There would be no reason to assess the validity of the RESS-DLV if its reliability could not be established first. Multivariate analyses were performed on the data obtained with the RESS-DLV in order to assess the instrument's reliability. Cronbach's alpha provides a reliability estimate that simultaneously considers all possible ways of splitting the test items in an inter-item correlational matrix. The degree of reliability was considered to be acceptable when Crohnbach's alpha > 0.70 (Field, 2000). The coefficient alpha of the RESS-DLV was high, 0.86, suggesting that, on the whole, the 16 scale items measure the same construct. The next step was to build subscales based on the three resulting factors and to consider the reliability of each subscale separately. Subscale 1, 'internal neighborhood reputation' (INR), contains the first eight items shown in Table 2.2. The result of the reliability analysis shows Crohnbach's alpha = 0.82. Thus, the internal consistency of the 'internal neighborhood reputation' subscale is quite high.

Subscale 2, 'social climate' (SC), contains items 9 through 12. The result of the reliability analysis shows Crohnbach's alpha = 0.75. Thus, the internal consistency of the 'social climate' subscale is satisfactory. Subscale 3, 'dwelling satisfaction' (DS), contains items 13 through 16. The internal consistency of the 'dwelling satisfaction' subscale is satisfactory, as the result of the relia-

bility analysis shows Crohnbach's alpha = 0.68. This figure is rather low, partly because so few items are included in this subscale. Overall, the reliability findings for the RESS-DLV and the separate subscales are encouraging.[1]

2.4.2 Abbreviated RESS-scale

To make an outcome measure like the RESS-DLV more suitable for policy research, it should be as compact as possible. For governments and other stakeholders it is less time consuming and less expensive to add a restricted set of items to an existing monitor or survey questionnaire. To that end, ways were sought to construct an abbreviated version of the RESS-DLV. Specifically, the population sample was divided in two groups by dichotomizing the whole database on the fourth quartile. One group consists of residents who are very dissatisfied (fourth quartile); the other comprises all other residents. The aim is to construct an abbreviated scale that can adequately classify most of the dissatisfied respondents.

The assumption underlying discriminant analysis is that each of the variables is normally distributed. In that light, it was necessary to test the hypothesis that all group variances are equal and that the samples come from normal populations. The normal probability plots suggest a departure from normality for each group. The assumptions that must be met to use a discriminant analysis are thus violated. Consequently, the decision was made to devise a binary logistic regression model.

The model tests the extent to which the 16 items in the RESS-DLV matrix are associated with overall neighborhood satisfaction, as measured by the RESS-DLV scale. The two groups of residents – the 'very dissatisfied' and 'all others' – serve as dependent variables in the regression model. The variables (the 16 scale items) are entered (forward) stepwise in the analysis. The results may be summarized as follows. The abbreviated scale correctly classifies extremely dissatisfied respondents in 85% of the cases correctly, with a reduced set of eight items. With the same set of items, 95% of all cases are predicted correctly. (See Table 2.3 for details on the eighth step).

The purpose of abbreviation was to highlight the ability of a restricted number of scale items to predict membership in the 25% of respondents who are very dissatisfied. With eight scale items, 85% of the very dissatisfied respondents can be predicted correctly. The abbreviated scale consists of items of all three subscales. The abbreviated scale is highly correlated with

1 The following values were found for the RESS-DLV total scale: mean 35; median 33; modus 28; min/max 16 and 76. For subscale 1, 'internal neighborhood reputation', the values are as follows: mean 17; median 16; modus 14; min/max 8 and 38. For subscale 2, 'social climate': mean 10; median 10; modus 7; min/max 4 and 19. For subscale 3, 'dwelling satisfaction': mean 7; median 7; modus 7; min/max 4 and 19.

Table 2.3 Logistic regression coefficients of RESS-DLV items most associated with extreme (dis)satisfaction; method forward stepwise. Step summary for eighth step

Variables in the equation eighth step	B	S.E.	Wald	Sig.
I am satisfied with my dwelling	1.748	0.041	1846.092	0.000
I am satisfied with my living environment	1.071	0.035	912.897	0.000
I feel at home in this neighborhood	1.436	0.043	1119.315	0.000
I don't feel an urge to move out of this neighborhood	1.150	0.029	1543.369	0.000
The buildings of this neighborhood are attractive	1.119	0.032	1242.664	0.000
In this neighborhood residents treat each other pleasantly	1.351	0.039	1187.910	0.000
I have a lot of contact with other residents in my neighborhood	1.445	0.038	1423.583	0.000
I live in a cozy neighborhood with a lot of cohesion	1.356	0.038	1268.945	0.000
Constant	-28.587	0.414	4767.580	0.000

Nagelkerke R-square 0.852 (Nagelkerke, 1991).

the total RESS scale, namely 0.96, which is highly satisfying. The restricted scale containing eight items instead of 16 is much more convenient for research. The eight items included in the abbreviated scale are as follows:
1. I have a lot of contact with other residents in my neighbourhood.
2. I am satisfied with my dwelling.
3. I feel at home in this neighbourhood.
4. Living in this neighborhood is not annoying.
5. I don't feel an urge to move out of this neighbourhood.
6. The buildings of this neighborhood are attractive.
7. In this neighborhood residents treat each other pleasantly.
8. I am satisfied with my living environment.

The following subsection presents the reliability assessment of the abbreviated RESS-DLV. To assess the reliability of the abbreviated version, the first step was principal component analysis. It revealed one factor explaining 43% of the variance. For the scale constructed with these eight items, the coefficient alpha was 0.80, which is satisfactory.[2]

2.4.3 Validity

Several analyses were performed to test the extent to which the RESS-DLV measures what it purports to measure: a resident's satisfaction with the living situation and the neighborhood. Most attention was given to criterion validity. First, as a measure of validity, the mean RESS-DLV score was determined in relation to the criterion 'living in a Dutch post-war mid-rise neighborhood'. When data that link housing variables with deprivation and dissatisfaction are examined, several types of neighbourhood – types based on physical characteristics – emerge as more 'problematic' than others. The scientific, social, and policy literature identifies several types as dysfunctional: post-war high-rise neighborhoods and prewar urban renewal areas, but also post-war low-rise areas. Despite historical variations in economic development, housing policy, and socio-cultural traditions, the problems in

2 The findings for the abbreviated RESS-DLV are: mean 16.7; median 16.0; modus 14.0; min/max 8 and 38.

Table 2.4 T-test

	Group	N	Mean	Standard deviation	t	P
Subscale for internal reputation	0	41687	16.9	4.4	21.0	0.000
	1	3456	18.6	5.0		0.000
Subscale for social climate	0	54923	10.1	2.9	17.8	0.000
	1	4378	10.9	3.0		0.000
Subscale for dwelling satisfaction	0	46755	7.3	2.1	19.9	0.000
	1	3837	8.0	2.5		0.000
RESS-DLV	0	35678	35	7.5	23.1	0.000
	1	3152	38	8.3		0.000
Abbreviated RESS-DLV	0	41687	17	4.2	23.0	0.000
	1	3456	18	4.7		0.000

Group 0 = people who do not live in a postwar mid-rise neighborhood.
Group 1 = people who do live in a postwar mid-rise neighborhood.

these types of neighborhood are similar throughout Western Europe. These areas are associated with below-standard living conditions, deprivation, isolated locations, poverty, a negative image, social isolation, pollution, and crime (Prak & Priemus, 1984; Heeger, 1993; Adriaanse *et al.*, 1997; Schwedler, 1998; Turkington *et al.*, 2004).

The post-Second World War mid-rise neighborhood was taken as the gold standard. This type of neighborhood is characterized by the following three conditions:

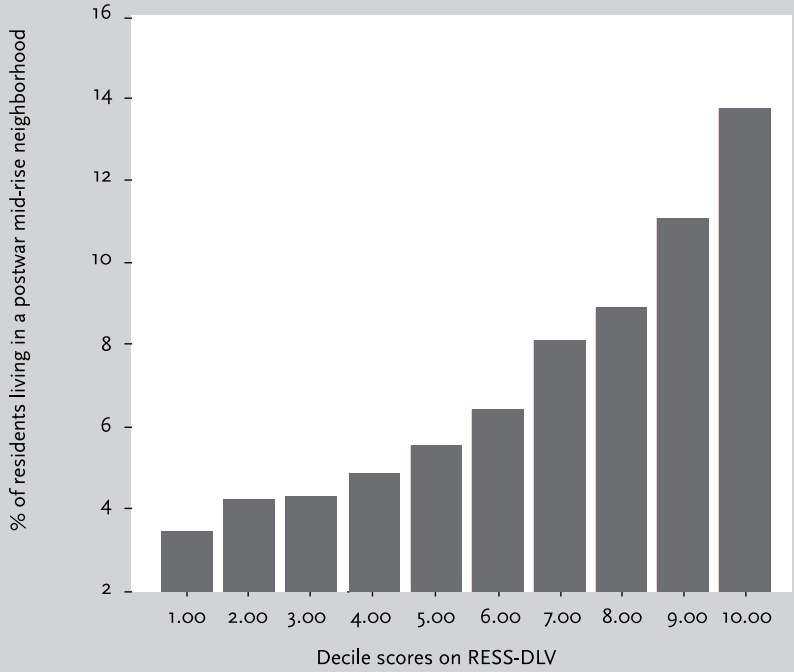
1. At least half of the housing stock in 2003 was built between 1945 and 1980.
2. The share of the dwellings in the total housing stock of the zip-code area is at least two standard deviations above the mean percentage of mid-rise flats in all Dutch neighborhoods.
3. The housing stock in the zip-code area is not predominantly (not 50% or more) of another type.[3]

For the analysis, the zip codes[4] of register data from the Woningmarktmonitor (ABF 2003) and the Wegener data file were matched with the zip codes of the respondents of the Housing Demand Survey 2002 sample. 7% (4,934) of the respondents of the Housing Demand Survey live in a zip-code area that can be typified as a post-war mid-rise neighborhood. In total, 116 neighborhoods in the country belong to the category 'post-war mid-rise'. The question is, are the residents of post-war mid-rise neighborhoods significantly more dissatisfied than people who do not live in a neighborhood of this type? A t-test shows that the RESS-DLV and its subscales can discriminate well between residents of post-war mid-rise neighborhoods and people living elsewhere. Table 2.4 shows the mean levels of satisfaction on the RESS-DLV and each of the RESS-DLV subscales for respondents who live in a post-war mid-rise neighborhood and those who do not. The higher the mean score, the more negatively the residents evaluate the fit between their household and

3 The zip-code area comprises at least 100 households. The variables for the construction of these criteria were derived from register data of Wegener and the ABF Woningmarktmonitor 2003.

4 Strictly speaking, Dutch 'postcode' areas (called zip-code areas here) do not exactly align with neighborhood boundaries. Nonetheless, this article refers to these zip-code areas as neighborhoods for the sake of convenience.

Figure 2.1 Association between % of residents living in a postwar mid-rise neighborhood and the score on the RESS-DLV



their living and housing situation.

Another way of demonstrating that the RESS-DLV measures what it purports to measure is to use all the available information. The first step was the division of the sample in 10 equal groups on the basis of the respondents' scores on the RESS-DLV.[5]

The bar chart below shows the 10 deciles. The first decile contains 3% of the respondents living in post-war mid-rise neighborhoods, while the 10th decile has almost 15%. Assuming that the RESS-DLV is valid, it is expected that the higher the score on the RESS-DLV, the more likely it is that that score comes from someone in a post-war mid-rise neighborhood. The bar chart shows the association between the percentage of persons living in a post-war mid-rise neighborhood and the score on the RESS-DVL (Figure 2.1).

The chart clearly shows that the association between living in a post-war mid-rise neighborhood and evaluating the living situation as unsatisfactory has a monotone upwardly climbing tendency. We can conclude that the RESS-DLV measures what it purports to measure. The higher the RESS-DLV score, the more dissatisfied the respondent is.

Tables 2.5 and 2.6 present the initial normative data, consisting of the 10 deciles for the population. A norm is a factual outcome score that is used as a criterion to determine severity. The tables of the range of variation in RESS-DLV scores and its abbreviated version may serve as baseline data for other

5 The deciles are described in more detail later in the section on norms and distributions.

Table 2.5 Scores of RESS-DLV deciles

Decile	Total RESS-DLV score	Degree of satisfaction
1	16 through 27	Extremely satisfied
2	28, 29	Very satisfied
3	30	Far above average satisfied
4	31, 32	Above average satisfied
5	33	Average satisfied
6	34, 35	Average satisfied
7	36, 37	Below average satisfied
8	38, 39, 40	Far below average satisfied
9	41 through 46	Very dissatisfied
10	47 through 76	Extremely dissatisfied
Mean	34.9	

Table 2.6 Scores of the abbreviated RESS-DLV deciles

Decile	Total abbreviated RESS-DLV score	Degree of satisfaction
1	8 through 12	Extremely satisfied
2	13	Very satisfied
3	14	Far above average satisfied
4	14	Above average satisfied
5	15	Average satisfied
6	16	Average satisfied
7	17	Below average satisfied
8	18, 19	Far below average satisfied
9	20 through 22	Very dissatisfied
10	23 through 38	Extremely dissatisfied
Mean	16.7	

researchers who may use the RESS-DLV or the abbreviated RESS.

2.5 First pattern detection in satisfaction severity groups on the RESS

This section describes the first results of a multivariate analysis carried out with the RESS-DLV. They show that the impact of the subscales in overall residential satisfaction varies significantly. In a study by Amérigo and Aragonés, multiple regression analysis revealed that attachment to the neighborhood and relationships with neighbors explained the greatest variance in residential satisfaction (Amérigo & Aragonés, 1990, p. 323). In the same vein, the outcomes of the multivariate analyses described in the following sections demonstrate that satisfaction with the social climate in the neighborhood is the most significant factor in overall residential satisfaction in the Netherlands.

The task was to find out which of the subscales dominates within the overall residential environmental satisfaction of Dutch residents (RESS-DLV). The first step was to make the RESS subscales independent of their length. This was done by dividing each subscale by the number of its items. The second step was to divide the sample of residents into four quartiles, ranging from residents who are very satisfied (1) to residents who are very dissatisfied (4).

Figure 2.2 Weighted mean score of severity groups on each subscale

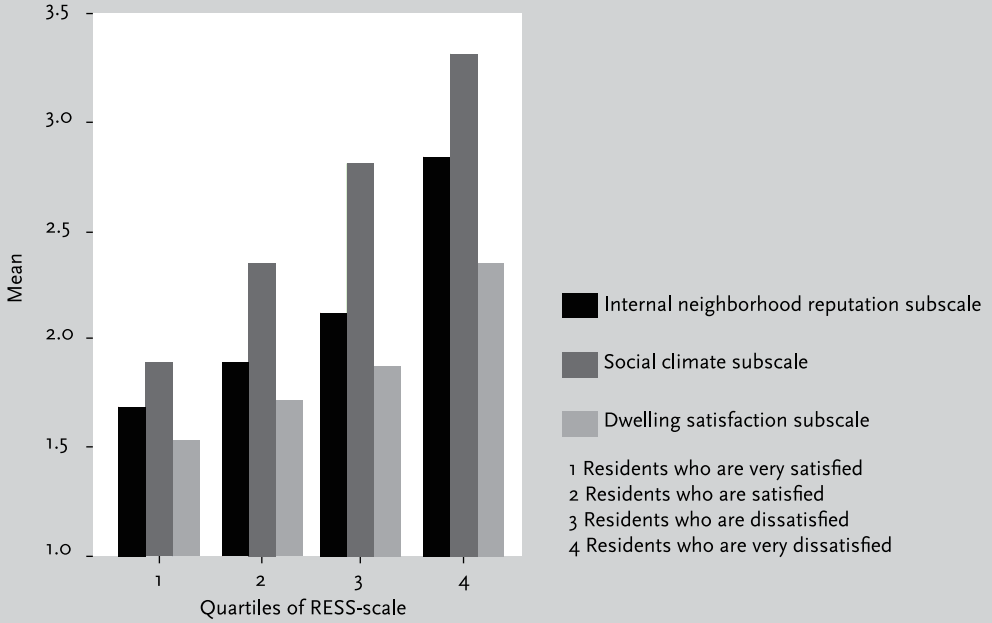


Figure 2.2 depicts the weighted mean score of each quartile (i.e. group defined by severity of dissatisfaction) on a bar chart.

In view of the extent to which the RESS subscales depart from normality, Friedman's tests were performed to find out which of the three weighted subscales of the RESS predominates in the residential environmental satisfaction of each quartile. The findings lead to the following conclusions. For all quartiles – from people who are (very) satisfied to people who are (very) dissatisfied – overall residential environmental satisfaction is dominated by the perceived social climate of the neighborhood. That aspect is always followed by the internal reputation and, in third place, by dwelling satisfaction. Differences between the (weighted) subscales within each group are always statistically significant, with P = 0.000. The mean ranks of the subscales were as follows. First quartile: subscale 'social climate' 1.9; subscale 'internal reputation' 1.7; subscale 'dwelling satisfaction' 1.5. Second quartile: subscale 'social climate' 2.4; subscale 'internal reputation' 1.9; subscale 'dwelling satisfaction' 1.7. Third quartile: subscale 'social climate' 2.8; subscale 'internal reputation' 2.1; subscale 'dwelling satisfaction' 1.9. Fourth quartile: subscale 'social climate' 3.3; subscale 'internal reputation' 2.8; and subscale 'dwelling satisfaction' 2.4.

How can these outcomes be interpreted in more general terms? First of all, except for the variance among neighborhood types, the differences reflect general developments in society at large. These changes have influenced the relationship between aspects of the living environment. At the beginning of the 20th century, the quality of the housing stock was far below its current level, both in the Netherlands and in other Western European countries. Consequently, slum clearance was a major policy issue at the time (Van der Horst *et al.*, 2002).

Nowadays, most people in the Netherlands have access to a dwelling of rea-

sonable quality. In the course of time, other aspects of the residential environment have become more important to the perception and evaluation of neighborhoods. For instance, people are now more concerned about the concentration of certain population groups and the accumulation of problems in specific neighborhoods (RIGO, 2004). These concerns do not seem to relate exclusively to the quality of the housing stock in these areas; it is plausible that socio-cultural factors play an important part. It is often suggested that a lack of social cohesion is an important factor in these problematic neighborhoods (e.g., Kearns & Parkinson, 2001).

A recent case study in the Buitenveldert district of Amsterdam – a problem-free area of a vulnerable neighborhood type – expands on this topic. There, it is not the degree of social interaction or social cohesion among the residents that explain their residential satisfaction. Rather, it is the shared social identity and the unwritten rules that explain the favorable social climate in the neighborhood (Adriaanse, 2006a, b). Generally speaking, the residents of Buitenveldert do not express satisfaction with their neighborhood in terms of the quality of the dwelling or the aesthetics of the architecture in the surroundings. Instead, they refer first and foremost to the favorable social climate. These research findings support the pattern detected in satisfaction severity groups on the RESS-DLV. Among those groups, satisfaction with the social climate in the neighborhood is significantly the most important element of overall residential satisfaction – unless a resident is either (very) satisfied or (very) dissatisfied.

2.6 Conclusion and discussion

This article first described residential environmental satisfaction as a global attitude of a resident (or household) towards his dwelling, the social climate of the neighborhood and the internal neighborhood reputation. The article then described the development and validation of the RESS-DLV, an instrument to measure residential environmental satisfaction. Though adequate, the instrument can be improved and refined and the subscale for dwelling satisfaction needs to be extended. The first analyses indicated that the RESS-DLV is a valid instrument. It can generate important additional information for policy-making on urban renewal and neighborhoods in general. With the help of the RESS-DLV and its abbreviated version, researchers can offer insight in the degree to which specific neighbourhood problems are of most concern – and to whom.

The pattern detection in satisfaction severity groups on the RESS-DLV demonstrated that residential environmental satisfaction is expressed not only by satisfaction with the dwelling or by the internal neighborhood reputation. Rather, it is mainly revealed by people's evaluation of the social climate

in their neighborhood. The importance of social climate for residential environmental satisfaction raises interesting questions for follow-up research. For example, further study could identify the ingredients of a satisfying social climate. Does it mean that there are intensive local networks and a close-knit neighborhood community? Or are there other determining factors? Young residents, married couples, female heads of households and large families consistently record less satisfaction with any given housing setting. Moreover, their satisfaction ratings are more strongly tied to perceptions of crime, rundown properties, and the similarity of neighbors (Galster & Hesser, 1981). Follow-up research is needed to determine whether these groups differ significantly in their perception of the three subdomains of residential satisfaction.

The RESS-DLV can help investigators conduct more selective and comparative research on neighborhood life and the conditions for residential environmental satisfaction. So far, little has been published on ways to compensate negatively experienced attributes of the living environment by other residential attributes. The RESS-DLV and its subscales could serve as the dependent or the independent variable in future research models. They could clarify whether subsets of residents tend to apply different standards when evaluating their residential environment.

Follow-up research should also consider the role differences in residential lifestyle play. And the picture would not be complete without the constraints on residential choice that households experience. Both are important mediating factors in the way residents evaluate neighborhood attributes. There is need for more insight into the fact that residents of vulnerable types of neighborhood are satisfied with their housing and living situation. A case study by the author is a first attempt to explore in some depth the differences between successful and problematic neighborhoods of the same vulnerable type (Adriaanse, 2004a, b). An interesting benefit of using the Housing Demand Survey data for this purpose is that it is feasible to measure residential environmental satisfaction and the way in which cognition is affected by changes in the environment such as reconstruction. Nowadays, it is possible to conduct longitudinal studies, as the data from the Housing Demand Survey go back over a long period of time.

Finding out which residents are most satisfied or dissatisfied with their neighborhood should provide policy-makers with additional information on where to target their improvement efforts. Comparison of the residents' views with the ways in which other stakeholders (housing associations, municipalities, policymakers) define and interpret a neighborhood's problems and success factors can bring to light any difference of opinion between the stakeholders. A fuller picture could then lead to more precise and probably more effective interventions in neighborhoods.

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3 The Dutch Residential Nuisance Scale: an outcome measure for reported nuisance in subgroup analysis

C.C.M. Adriaanse, International Journal of Housing Policy, 2008, 8 (4), pp. 341-360, Routledge.

Abstract
Many neighbourhoods dating from the early sixties in western European cities have reached the end of their useful life and have been slated for restructuring or are already in the process. Much is known about the prevalence and background of problems in these neighbourhoods and about the effects of measures taken so far. Less is known about the factors that keep neighbourhoods physically, economically and socially vital, however. What makes them 'good' or 'viable'? Some say that certain neighbourhood types are vulnerable by design, particularly the areas built after the Second World War throughout Western Europe. The main objective of this paper is to introduce a comprehensive approach for measuring the frequency of perceived nuisance in the residential environment. To that end, it presents some preliminary subgroup analyses investigating whether subsets of residents rate nuisance differently. A residential nuisance scale is empirically tested using multivariate analysis. The results of an exploratory factor analysis offer empirical support for the claim that the proposed model of reported frequency of residential nuisance is useful. Reliability and validity tests confirm the adequacy of the Residential Nuisance Scale – Dutch Language Version (RNSDLV), since it correlates as expected with various criterion measures. In the future, this compact and valid instrument can serve as the dependent or independent variable in research carried out in the Netherlands and other European countries. Such research could elucidate which physical-spatial and socio-cultural factors determine the perception of nuisance in different neighbourhood types by relating the RNS to a measure of residential environmental satisfaction.

Keywords
Livability, reported frequency of nuisance in the residential environment, multidimensional outcome measure, reliability, subgroup analysis

3.1 Introduction

In the Netherlands, as elsewhere in Western Europe, urban renewal policies are in place to restructure many post-Second World War mid- and high-rise neighbourhoods; some are already in the process of transformation (Turkington *et al.*, 2004). Ultimately, at the national level, the policies envision a nor-

malised situation: no physical disadvantages, a pleasant living environment without nuisance, no concentrations of deprivation, no tensions between residents, an average rentability or purchase price trend, and an acceptable image. By extension, the quality of the living environment is an important policy issue for local governments and housing associations (Schalkwijk, 2007; Ministerie van VROM, 2007a, 2007b; Aedes, 2007; Shaw, 2004; Maclennan, 2006).

Most residents of Dutch neighbourhoods are satisfied with their living environment (80%), and 6% are even very satisfied. Nonetheless, physical and social nuisance in the daily living environment pose a threat to its livability and can significantly reduce the quality of life there. Nuisance may be physical, such as neglect or it may be social, such as annoyance due to interaction between people (Adriaanse, 2005). Often, both forms appear in the same place and reinforce each other: people tend to feel unsafe in neighbourhoods subject to pollution and vandalism. The effect of nuisance on the assessment of the residential environment is pronounced when social nuisance is caused by threatening situations such as being assaulted or confronted with drug abuse (RIGO, 2004, p. 9). Compared to nuisance, the effect of criminality – i.e. robbery, burglary and violent crime – is less pronounced, although it does have a negative influence on the appreciation of the neighbourhood. This is probably because people are more often confronted with nuisance than with criminality. Crucially, criminality is less bound to a place (RIGO, 2004, p. 9).

In common parlance, a 'nuisance' is a thing, person or situation that is annoying or that causes trouble or problems. The word is rarely used in scientific work on neighbourhoods, unlike the word 'livability', which is closely connected to the perception of nuisance. Although livability is also a common word, it has evolved to embrace everything that is wrong with the residential environment, especially in urban areas. It has thus become a concept reflecting an overall assessment of the residential environment, and usually a negative one at that (RIGO, 2004). Thus, as an entailment of livability, nuisance is part of a paired subjective concept. Nuisance in the residential environment is reported and experienced by individual residents, while livability refers to the quality of the residential environment and thus pertains to a higher aggregation level. People experience and appreciate places in various ways in light of their own norms and values. But their assessment is also dependent on the specific functions of a certain place: noise and disorder are judged differently in the inner city than in a residential area.

Policy interventions attempt to restrict issues that limit or hinder livability and enhance situations that have a positive influence on it and thereby increase the chance that livability will improve (Van der Burg, 2006). By its subjective nature, livability remains difficult to define and thus to measure. Therefore, the effort made in the present study to advance an objective and rigorous quantification and qualification through a set of accepted key performance indicators meets a clear and present need. It is of critical relevance

to those involved in the planning, programming, and management of urban areas (Balsas, 2004).

A monitoring system is particularly suited to a dynamic and comparative study of neighbourhood livability, as it can show the effects of an accumulation of problems at the neighbourhood level (Van der Meer, 1996).To be able to formulate local policies for improving livability, urban governments – with the aid of universities – select indicators to develop their own local monitoring instrument (see, e.g. Gemeente Roermond, 2005; Kuijpers & Goudsmit, 2007; Kellet *et al.,* 2008). Municipal monitors provide useful input for local policies. But comparison at a higher level of aggregation, e.g. across cities, is not possible because of the incomparability of the data generated. The desired benchmarking between neighbourhoods and across cities would be possible if the monitoring system were used by not one but all local governments in a specific region or country. And that condition is met by the Dutch livability monitor called LEMON. This general livability monitor was developed by the umbrella organisation of Dutch housing associations Aedes (Thedinga & Wilkens, 2006).

Like most local livability monitors, LEMON is a 'stripped monitoring system'. But when a stripped monitoring system uses only a few indicators, which is common practice, it cannot provide sufficient insight in the actual neighbourhood dynamics (Van der Meer, 1996). That is an obstacle because, to identify what causes the perceived problems, it is necessary to relate the information output of the monitoring system to the broader context (Van der Meer, 1996). Various factors at different levels influence the quality of life and degree of nuisance that is perceived. For instance, perception is influenced by the individual characteristics of the residents and the social structure of the neighbourhood, but also by socio-cultural and macro-economic developments and government policies. Concretely, the presence of multiple ethnicities in many large-scale, formerly public, housing estates across Europe has often engendered conflicting lifestyles that pose a challenge to nuisance prevention (Reijndorp, 2004; Adriaanse, 2006a, 2008, forthcoming). Therefore, as van der Meer concludes, the complexity of the problem itself, as well as the increased complexity of society, which is reflected in less clear and less stable interrelationships between physical and social neighbourhood characteristics, must be reflected in the design of the neighbourhood monitoring system. To this we add that the system should specifically reflect the complexity of the problem of nuisance.

The aim of this article is to describe the development of a Residential Nuisance Scale based on data derived from The Netherlands Housing Demand Survey. This large national survey contains data on how people evaluate aspects of their residential environment. It includes the respondents' background variables, which might be considered risk factors that contribute to (the perception of) residential nuisance. As Sampson and Raudenbush (2004) point out, perceptions of disorder vary, depending not only on the observed

conditions but also on the characteristics of individual residents and the neighbourhood's social structure. This is of particular interest here because, as the present study suggests, disorder is often connected with 'nuisance'. The importance of devising a compact measure for the reported frequency of residential nuisance as part of a larger database that is renewed every four years is that the instrument creates opportunities for follow-up research. Such studies might explain the differences in the frequency of reported nuisance and the nuisance perception between places and groups of people. But the instrument described here has another advantage. The large sample size makes it possible to distinguish norm scores for different groups of residents, which in turn creates opportunities for benchmarking and evaluating time series.

The next section (3.2) presents the theoretical framework, and Section 3.3 describes the data and methods used in this study. The Section 3.4 expands on the Residential Nuisance Scale – Dutch Language Version (RNS-DLV). There, we consider the reliability and validity of the new scale and present the norms and distribution. The predictive value of individual items on the nuisance scale is then explored in Section 3.5. Section 3.6 is devoted to multivariate analyses that elucidate the relation between the RNS and residential environmental satisfaction. The paper concludes with a discussion, policy recommendations, and suggestions for further research.

3.2 Perception and the reported frequency of nuisance in the residential environment

Nuisance has an impact in several domains of life. There is evidence that the perception and the reported frequency of nuisance are related to an individual's health. People who often experience noise nuisance are twice as likely to have middling to poor health compared with people who are never exposed to noise pollution. The same applies to the relation between noise nuisance and psychological problems or trouble sleeping. Although city-dwellers report noise nuisance more often, they are not the only ones with this problem. In both the city and the countryside, people who experience noise pollution tend to have more psychological complaints, middling to poor health, and trouble sleeping (Jabaaij, 2005).[1]

The experience of nuisance is also related to income. According to a recent study, lower income groups in the Netherlands generally live in areas with less favourable environmental qualities, particularly due to traffic and air pol-

1 The analyses reported here are based on LINH data of the second national study on illnesses and minor procedures in the family doctor's office (2001; www.nivel.nl/nationalestudie). The survey was answered by 12,699 residents. LINH is a project carried out jointly by NIVEL, WOK, LHV, and NHG.

lution (Kruize, 2007). These same areas often accommodate diverse cultural and ethnic groups and have a high rate of unemployment. Moreover, these neighbourhoods are confronted with social nuisance, crime, poverty, and other livability problems (Turkington *et al.,* 2004). In sum, people who are already in unfortunate socio-economic circumstances have a significantly higher chance of being exposed to environmental quality problems, but also to social nuisance and livability problems in their residential area.

Countless policy programmes classify neighbourhoods as 'problematic' on the basis of their external appearance. They are characterised by their masterplanning structure and the predominance of certain housing types (Kruythoff & Haars, 2002; RIGO, 1995). But the physical structure of neighbourhoods does not adequately explain the differences between neighbourhoods with regard to residential environmental satisfaction (Adriaanse, 2007a, 2007b) or the concentration of nuisance, criminality, and other livability problems.

Neighbourhoods with the same initial planning structure can develop in a completely different direction. Thus, one may end up in the 'problematic' category while another will not. Neighbourhoods that got off to an equal start as potential environments over time became different effective environments due to differences in use and management (Gans, 1968; Van der Horst *et al.,* 2002). Therefore, the improvement of problematic neighbourhoods focuses not only on the physical but also on the social dimensions. The housing stock is being improved; steps are taken to combat criminality; and adequate facilities are provided. But one question remains (RIGO, 2004): which aspects predominate in the residents' perception of livability?

Why are certain neighbourhoods experienced as attractive? Why are the residents satisfied with their living environment? And why are other neighbourhoods not considered appealing? In earlier work it was concluded that the perception of the social climate in the neighbourhood dominates in residential environmental satisfaction, regardless of the level of overall residential (dis)satisfaction. The primacy accorded to perceived social climate is always followed by internal reputation and, in third place, by dwelling satisfaction (Adriaanse, 2007a, 2007b). In view of the implications of nuisance for the quality of life, it is urgent to find out more about the distribution and background of nuisance experience and about the extent to which nuisance in the residential environment makes the difference between a satisfying and a dissatisfying living situation.

3.3 Data and methods

First, this section presents a comprehensive approach for measuring the frequency of perceived nuisance in the residential environment. Then some initial subgroup analyses are presented to discern whether subsets of residents

Table 3.1 The 10 Housing Demand Survey items regarding unpleasant events or offenses in the neighborhood used in the analysis

1. Does it hardly ever/never, sometimes or often occur that walls and/or buildings are defaced?
2. Does it hardly ever/never, sometimes or often occur that telephone boxes or tram or bus shelters are damaged?
3. Does it hardly ever/never, sometimes or often occur that there is litter on the street?
4. Does it hardly ever/never, sometimes or often occur that there is dog dirt on the street?
5. Do you hardly ever/never, sometimes or often experience nuisance caused by your immediate neighbors?
6. Do you hardly ever/never, sometimes or often experience nuisance caused by local residents?
7. Do you hardly ever/never, sometimes or often experience nuisance caused by young people?
8. Do you hardly ever/never, sometimes or often experience noise nuisance?
9. Do you hardly ever/never, sometimes or often encounter stench, dust, or refuse?
10. Do you hardly ever/never, sometimes or often experience traffic nuisance?

perceive different ratings of nuisance. The analyses are based on Dutch survey and registry data. The results of the 2002 national housing survey (Housing Demand Survey, 2002) were used along with data on the characteristics of the Dutch housing stock at the zip-code level. The latter were derived from the ABF *Woningmarktmonitor* (2003) and the Wegener data file (2002). The *Housing Demand Survey 2002* comprises a random sample of 75,034 Dutch residents. This survey, the successor to the general census of housing and population, has been held every four years since 1964, and its results are used to develop government policy. It provides information about household composition, housing situations, affordability, demand, and residential mobility. The survey includes questions on how residents feel about their living situation: about the frequency of their perception of different types of nuisance and their evaluation of the residential environment. The theoretical insights mentioned above provided a framework for the initial selection of variables from the questionnaire of the Housing Demand Survey. The selection criteria were refined in light of the present author's own research in two mid-rise neighbourhoods in Amsterdam and The Hague (Adriaanse, 2004b). That research yielded insight into the factors contributing to the success of the neighbourhoods from the residents' point of view. The factors they identified referred to physical, spatial, and socio-cultural characteristics of their neighbourhood as well as to (the absence of) sources of nuisance. Table 3.1 gives an overview of the Housing Demand Survey variables (based on the English-language version) that were selected for the analyses.

3.4 Development of the Residential Nuisance Scale

Before reporting on the development of the Residential Nuisance Scale, it is important to discuss the advantage of a scale as an outcome measure for the reported frequency of nuisance, as described above using single-scale items. A reliable and validated outcome measure – a scale – is a better technique in a

Table 3.2 Rotated Component Matrix

	Components	
	1	2
'...litter on the street...'	.731	
'...walls and/or buildings defaced ...'	.658	
'...dog dirt on the street...'	.656	
'...nuisance caused by young people...'	.526	
'...stench, dust, refuse...'	.521	
'...traffic nuisance...'	.358	
'...nuisance caused by immediate neighbors...'		.818
'...nuisance caused by local residents...'		.786
'...noise nuisance...'		.686

Extraction method: Principal Component Analysis.
Rotation method: Varimax with Kaiser Normalization.
Rotation converged in three iterations.

sociometric sense because it distinguishes clearly between the measurement error and the true scores. Moreover, a scale provides more information as it combines different variables that are interrelated and describe the same underlying construct – here, the reported frequency of nuisance (Drenth & Sijtsma, 1990). According to Kotval (2001, p. 44, cited in Balsas, 2004), an indicator is a measure or a set of measures that describes a complex social, economic, or physical reality. Specifically, a measure is one data point that acts as a gauge to tell us how well or poorly we are doing with respect to an indicator. Indicators offer knowledge and insights about the health and well-being of a community. Indicators provide a tool for analysis, mediation, and decision-making among urban actors. Measures use quantifiable data, preferably collected over time, to identify trends and assess whether conditions are improving, continuing at a steady pace, or deteriorating. Measures can change over time to reflect relevance, availability of new data, and development in society.

Explorative factor analysis was used to develop the Residential Nuisance Scale – Dutch-Language Version (RNS-DLV). Before conducting that factor analysis, though, the inter-item correlation matrix of the ten Housing Demand Survey items listed in Table 3.1 was carefully examined. On item 2 – Does it hardly/never, sometimes or often occur that phone booths or bus or tram shelters are damaged in this neighbourhood? – more than 12% of the cases were missing after list-wise deletion. Therefore, this item was not subjected to further analysis. The remaining nine Housing Demand Survey questions were used in an unforced exploratory factor analysis with Varimax rotation. The factor analysis resulted in two components; see Table 3.2 for the rotated factor loadings.

We can interpret the outcomes as follows. The items that load on the first component all are sources of nuisance; in other words, they are 'things that are experienced as a nuisance'. In particular, the presence of adolescents that gather together in public spaces is often experienced as a threat, especially by elderly people. The items that load on the second component represent sources of (mainly) noise pollution to which nuisance is ascribed by residents.

An alternative interpretation of the two factors would be that the first one refers more directly to environmental or street-based problems and the second more directly to people-related problems. Possibly the nuisances of the

second factor have to do with anti-social behaviour (Upson, 2006). But also an environmental factor such as 'houses with thin walls' can be a structural factor causing noise nuisance, without anti-social behaviour being an issue.

Now the nuisance scale can be constructed. The Residential Nuisance Scale (RNS) is a self-reporting instrument consisting of nine rating scales for measuring the frequency of experienced nuisances. The respondents' answers are scored on a Likert scale with three possible answer categories: hardly/never = value 1; sometimes = value 2; often = value 3. The total score is calculated by counting up the individual answers on each of the nine Likert scales.

3.4.1 Reliability

There would be no reason to assess the validity of the RNS-DLV if its reliability could not be established first, reliability being the most fundamental aspect of sociological measurement. Multivariate analyses were performed on the data obtained with the two components (see Table 3.2) in order to assess the instrument's reliability.[2] The degree of reliability was considered to be acceptable when Crohnbach's alpha > 0.70 (Field, 2000).

With respectively 0.70 and 0.67 as the alpha scores of each component, it was decided to consider them as reliable separate subscales, except when the alpha score of the second subscale is rather low and must be improved. Together the two components accounted for 48% of the variance. The coefficient alpha of the total RNS-DLV was sufficient, 0.76. This suggests that, on the whole, the nine scale items measure the same construct. The following values were found for the RNS-DLV total scale: mean 12.5; median 12.0; modus 9.0; min/max 9 and 27 (N = 65,862). These measures of central tendency show that the distribution of the RNS scores is strongly skewed to the right.

3.4.2 Validity

Several analyses were performed to test the extent to which the RNS-DLV measures what it purports to measure: the reported frequency of a resident's experience of nuisance in the neighbourhood where he or she resides. Attention was given to criterion validity. First, as a measure of validity, the mean RNS-DLV score was determined in relation to the criterion 'living in a Dutch post-Second World War mid-rise neighbourhood'. The scientific, social, and policy literature identifies several neighbourhood types as dysfunctional: post-war high-rise neighbourhoods and pre-war urban renewal areas, but al-

2 Cronbach's alpha provides a reliability estimate that simultaneously considers all possible ways of splitting the test items in an inter-item correlation matrix (Field, 2000).

so post-war low-rise areas. For the following analysis the post-war mid-rise neighbourhood is taken as a criterion.

Despite historical variations in economic development, housing policy, and sociocultural traditions, the problems in this type of neighbourhood are similar throughout western Europe. These areas are associated with below-standard living conditions, deprivation, isolated locations, poverty, a negative image, social isolation, pollution, and crime (Prak & Priemus, 1984; Heeger, 1993; Adriaanse, 2004a, 2004b; Schwedler, 1998; Turkington *et al.,* 2004).

This neighbourhood type is characterised by the following three conditions:

1. At least half of the housing stock in 2003 was built between 1945 and 1980.
2. The share of the dwellings in the total housing stock of the zip-code area is at least two standard deviations above the mean percentage of mid-rise flats in all Dutch neighbourhoods.
3. The housing stock in the zip-code area is not predominantly (i.e. not 50% or more) of another type.[3]

For the analysis, the zip codes[4] of register data from the ABF Woningmarkt-monitor (2003) and the Wegener data file were matched with the zip codes of the respondents of the Housing Demand Survey 2002 sample. 7% (4,934) of the respondents of the Housing Demand Survey live in a zip-code area that has the characteristics of a post-war mid-rise neighbourhood. In total, 116 neighbourhoods in the country belong to the category 'post-war mid-rise' (Adriaanse, 2007a). The non-parametric testing procedure Mann-Whitney was used to determine whether residents of a post-war mid-rise neighbourhood experience nuisance significantly more often than people who do not live in such a neighbourhood. The test results are convincing and support the hypothesis that people living in a post-war mid-rise neighbourhood experience nuisance significantly more often than people who don't live in a neighbourhood of that type (See Table 3.3).

Second, as a measure of validity, the mean RNS-DLV score was determined in relation to the criterion 'qualitative dwelling type'. The typology of dwellings is as follows: 1. detached house, 2. semi-detached house, 3. corner house, 4. terraced house, 5. flat, apartment. If the respondent's dwelling did not fit into one of these descriptors, the answer was 'none of these'; this answer category was considered as 'missing' in the analyses.

It appears from earlier research that, with respect to nuisance caused by

3 The zip-code area comprises at least 100 households. The variables for the construction of these criteria were derived from register data of Wegener and the Woningmarktmonitor.

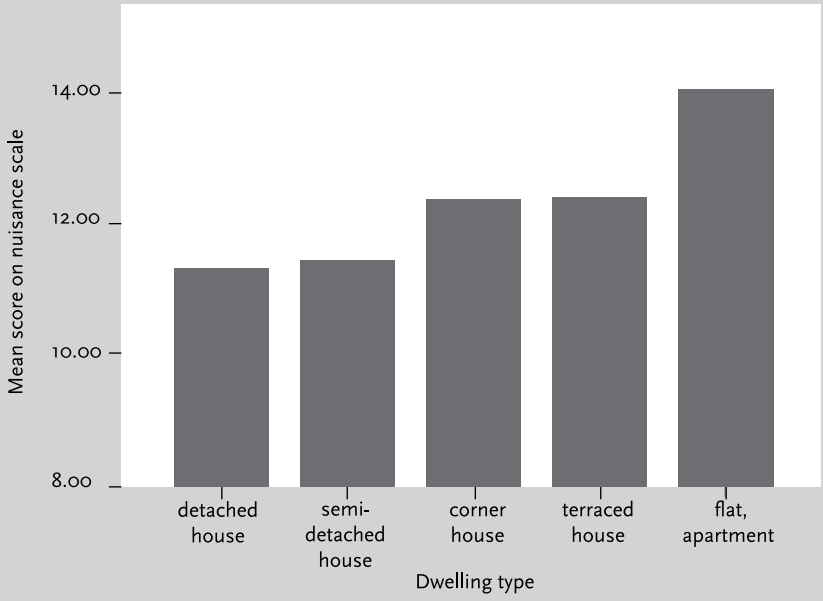
4 Strictly speaking, Dutch 'postcode' areas (called zip-code areas here) do not exactly align with neighbourhood boundaries. Nonetheless, this article refers to these zip-code areas as neighbourhoods for the sake of convenience.

Table 3.3 Mann-Whitney test

Unweighted mean score on RNS scale	N	Mean rank
Group 0	61291	32578.10
Group 1	4571	37670.08
Total	**65862**	

Group 0 = not living in a post-WWII mid-rise neighborhood.
Group 1 = living in a post-WWII mid-rise neighborhood.
Mann-Whitney = 117106899.000
Wilcoxon W = 1996744511.5
Z = -17.613
P = 0.000

Figure 3.1 Mean RNS score by dwelling type



neighbours and co-residents, where you live does make a difference. In 2006 a representative sample of 2,000 Dutch residents were asked questions about their neighbourhood. It appeared that people in cities report nuisance significantly more often (38%) than people in the country (27%). Furthermore, homeowners experience significantly less nuisance than renters: almost half of the renters sometimes experience nuisance. Four out of ten residents of apartment dwellings report nuisance, compared to one-third of the people living in a single-family dwelling. Only two out of ten residents of detached houses had any complaints (Putter, 2007). The question is, do the respondents to the *Housing Demand Survey* who live in the qualitatively differing dwelling types distinguished here report levels of nuisance that are significantly different on the RNS scale? The bar chart in Figure 3.1 visualises the mean RNS scores of respondents for each qualitative dwelling type.

A non-parametric Kruskal-Wallis test was performed because of the marked

Table 3.4 Kruskal-Wallis test 'residents by qualitative dwelling type'

Qualitative dwelling type	N	Mean	Mean rank
1. Detached house	9764	11.3344	19309.48
2. Semi-detached house	8278	11.4593	20624.37
3. Corner house	8393	12.3897	24839.70
4. Terraced house	19178	12.4224	24876.59
5. Flat, apartment	309	14.0744	31096.80
Total	**45922**	**12.5256**	

Kruskal-Wallis test chi-square = 1918.982; Df = 4
P = 0.000

Figure 3.2 Mean scores on RNS of respondents by dwelling type (tenure and price)

asymmetry permeating the distribution of the dependent variable. (See also the histogram in Figure 3.3.) The test shows that the RNS-DLV can discriminate well between residents living in different dwelling types. Table 3.4 shows the mean levels of experienced nuisance as reported on the RNS-DLV for each qualitative dwelling type as well as their mean rank scores. The higher the mean scores, the more often the residents report nuisance on the RNS scale.

As Table 3.4 shows, the Kruskal-Wallis test reveals significant differences between the five qualitative dwelling types, except for the corner house and the terraced house, for which the mean ranks are almost the same. We can conclude that the RNS scale discriminates well between more and less luxurious dwelling types.

Third, as a measure of validity, the mean RNS-DLV score was determined in relation to the criterion 'tenure and price range of the dwelling' (see Figure 3.2). More than one-third of the Dutch population is said to experience nui-

Table 3.5 Kruskal-Wallis test, residents by 'tenure and price range of their dwelling'

Dwelling type 'price and tenure'	N	Mean	Mean Rank
1. Lives in a cheap social rental dwelling	13926	13.3684	36096.47
2. Lives in a semi-cheap social rental dwelling	10282	13.4049	34687.19
3. Lives in an expensive rental dwelling	3775	13.0749	33867.05
4. Lives in a cheap owner-occupied dwelling	7285	12.8546	32333.15
5. Lives in a semi-cheap owner-occupied dwelling	11295	12.4759	30111.11
6. Lives in an expensive owner-occupied dwelling	17510	12.0488	27976.78
Total	**64073**	**12.5021**	

Kruskal-Wallis test chi-square = 2473.709; Df = 5
P = 0.000

sance caused by immediate neighbours or local residents (34%) (Putter, 2007). Their assessment of their residential environment appears to depend partly on the location of the place of residence and partly on the respondent's personal background. City-dwellers apparently consider their neighbourhood unsatisfactory more often than people living in the countryside. People who reside in one of the four biggest cities are significantly more dissatisfied with their residential environment. Taking their personal background into account, it appears that more of the dissatisfied residents are renters (RIGO, 2004, p. 8). Differences in income are less important.

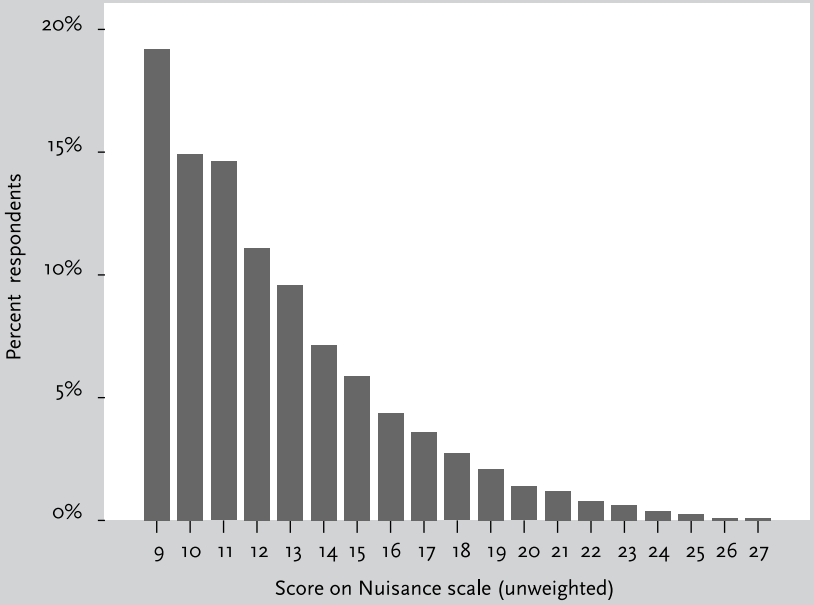
The physical characteristics of the neighbourhood also influence the residents' perception: the higher the density and the number of flats, the lower the environmental satisfaction of the residents (RIGO, 2004, p. 8; Adriaanse, 2007a). Renters and apartment-dwellers complain most (Putter, 2007). It should be noted that the building type affects the overall assessment of the neighbourhood. Environmental satisfaction is influenced by the fact that neighbourhoods with high densities and a high proportion of flats have a different population composition from low-density neighbourhoods. In combination with the higher prevalence of criminality and nuisance in these – mostly big-city – neighbourhoods, the effect of the building type is distorted by the associated social phenomena (RIGO, 2004, p. 8).

The dwelling typology constructed according to the price range and the tenure type of the dwellings was taken as a third criterion. The typology is as follows: 1. cheap social rental dwelling; 2. semi-cheap social rental dwelling; 3. expensive rental dwelling; 4. cheap owner-occupied dwelling; 5. semi-cheap owner-occupied dwelling; 6. expensive owner-occupied dwelling.

Table 3.5 shows the mean levels of reported nuisance on the RNS-DLV for each dwelling type defined by price range and tenure. It also shows their mean rank scores. The higher the mean scores, the more often the residents experience nuisance.

The differences are also significant when a Kruskal-Wallis test is performed on the six dwelling types defined by price range and tenure. We can conclude that the RNS scale differentiates well between these dwelling types. We can also conclude that the RNS-DLV measures what it purports to measure. The RNS-DLV score climbs with a higher frequency of reported nuisance experience.

Figure 3.3 Distribution of the RNS scale*



* Mean = 12.5256; SD = 3.38014; N = 65,862.

Table 3.6 Scores of RNS-DLV quartiles

Quartile	Total RNS-DLV score	Degree of reported nuisance experience
1	9 through 10	25% (Almost) no nuisance experience
2	11, 12	25% Little to median nuisance experience
3	13, 14	25% Above median nuisance experience
4	15 through 27	25% Far above median nuisance experience
Mean	12.5	
Median	12.0	

3.4.3 Norms and distribution

The histogram in Figure 3.3 clearly shows that the distribution of the RNS scale is strongly skewed to the right.

Table 3.6 presents the initial normative data, consisting of the four quartiles for the population. A norm is a factual outcome score that is used as a criterion to determine severity. The tables of the range of variation in RNS-DLV scores may serve as baseline data for other researchers who may use the RNS-DLV.

3.5 Predictive value of individual RNS items

Colleague researchers may want to develop the subscales of the RNS in order to make them more suitable to an investigation of the frequency of reported nuisance within specific subgroups of residents. With that in mind, the pre-

Table 3.7 RNS items needed to classify 68% to 74% of the cases that experience nuisance extremely often, for each dwelling type

Qualitative dwelling type	RNS items
Detached house (14 c.o.)	1. 'litter on the street'
Semi-detached house (14 c.o.)	2. 'dog dirt on the street'
	3. 'nuisance caused by young people'
	4. 'noise'
Corner house or terraced house (16 c.o.)	1. 'litter on the street'
	2. 'nuisance caused by local residents'
	3. 'noise'
	4. 'stench, dust, refuse'
Flat, apartment (18 c.o.)	1. 'litter on the street'
	2. 'nuisance caused by young people'
	3. 'noise'
	4. 'traffic'

C.o.= specific RNS cut-off by dwelling type.

dictive value of the individual scale items was investigated. The results of a multivariate analysis carried out with the RNS-DLV show that the impact of the individual scale items on the overall perception of nuisance varies significantly. The task was to find out which of the scale items predominate within the overall nuisance experienced by Dutch residents (RNS-DLV). Subsequently the sample was dichotomised on the extreme 90th percentile (score 17); 11.6% of the respondents report 17 or more points on the RNS scale.

In total, 8,682 respondents perceive severe nuisance. But which of the RNS items classify these cases correctly? To investigate this, a binary logistic regression was performed (forward conditional). Logistic regression programmes provide classification tables that indicate the predicted and observed values of the dependent variable for the cases in the analysis. In classification models, the goal is to classify cases according to whether they satisfy a specific criterion (Menard, 2002).

The findings of the binary logistic regression analysis allow us to draw the following conclusions. Most (92%) of the variance was explained by the four forms of nuisance that are the most significant for residents who perceive extreme nuisance. The following four RNS scale items dominate the most frequently reported nuisance: 'litter on the street'; 'dog dirt on the street'; 'noise nuisance'; and 'traffic nuisance'. Similarly, findings from the United Kingdom also show that litter and noise have the most significant impact on reported nuisance perception (Upson, 2006).

Separate investigations for each dwelling type give more detailed insight in the way sources of nuisance are related to dwelling types. In order to investigate the patterns of reported nuisance for each type, the 90% extreme scores were calculated. The cut-off scores are shown in Table 3.7.

The results demonstrate that the frequency of nuisance reported by residents of different dwelling types refers to nuisance items of both components of the RNS (see Table 3.2 for the nuisance items by component). This can be understood by regarding the differences in the environmental setting and housing conditions and – strongly related to this – the differences in location of the neighbourhoods where the respective dwelling types are found.

3.6 Do subgroups have different frequencies of reported nuisance?

This section presents some subgroup analyses to clarify whether subsets of the population apply different standards when evaluating their residential environment. It is interesting to investigate whether, respectively, men and women, respondents with distinct educational levels, and residents of different age groups report different levels of nuisance. The method used here is to determine the value of Kendall's tau. This rank correlation coefficient is used to measure the degree of correspondence between two rankings and assess the significance of this correspondence. In other words, it measures the strength of association of the cross-tabulations. The Kendall's tau coefficient (τ) has three properties: (a) if the agreement between the two rankings is perfect (i.e. the two rankings are the same), the coefficient has a value of 1; (b) if the disagreement between the two rankings is perfect (i.e. one ranking is the reverse of the other), the coefficient has a value of -1; (c) for all other arrangements, the value lies between -1 and 1, and increasing values imply increasing agreement between the rankings. If the rankings are completely independent, the coefficient has a value of 0 on average.

We started by performing univariate analyses. The RNS norm scores were first related with gender. The Kendall's tau value for women is -0.13; for men Kendall's tau is -0.11. The values are close to 0, which means that the rankings are almost completely independent. We then related the RNS norm scores to age.[5] The Kendall's tau coefficient is -0.12, which means that the correspondence between RNS and age is insignificant.

The same procedure was followed for the variable 'educational level'. The following ten levels of education were distinguished, which form an ordinal range: (1) none; (2) primary school; (3) lower secondary vocational (LBO), lower vocational technical (LTS), junior commercial (LEAO), junior domestic science (LHNO), etc.; (4) junior general secondary education/higher elementary; (5) pre-vocational secondary; (6) upper general secondary; (7) upper secondary vocational; (8) pre-university; (9) higher professional; (10) university. The Kendall's tau rank correlation coefficient for correspondence between RNS and educational level appears to be 0.069 (N = 65,862). Also this value is close to 0, which means that the rankings are almost completely independent.

We can conclude from these subgroup analyses that a respondent's score on the RNS is not related to one's age or gender, nor to one's educational level. These analyses were all performed in a univariate way. A multivariate analysis is more sophisticated and would allow us to confirm what we found by univariate analysis.

5 The following age groups were constructed: 18-24, 25-44, 45-64, 65-84, and 85 years and older.

The selected multivariate method is cluster analysis, which seeks to identify a set of groups that would minimise within-group variation and maximise between-group variation. SPSS offers three general approaches to cluster analysis. Here, K-means clustering was chosen, whereby the researcher specifies the number of clusters in advance and then calculates how to assign cases to the K clusters.

Three readily interpretable clusters come out of the analysis taking gender, age, and educational level as the variables. The first cluster consists of the younger respondents, with a mean age of 28 years (min. 18 and max. 38; N = 31,730). The second cluster consists of the middle-aged category, with a mean age of 49 years (min. 39 and max. 60; N = 26,879). The third cluster comprises elderly respondents, with a mean age of 71 years (min. 60 and max. 104; N = 16,021). The youngest group has the highest mean educational level, namely senior vocational education. The oldest group has the lowest level, with junior general secondary education as the median. The group with a mean age of 49 has a median educational level, whereby junior general secondary education is the median.

The second step is to investigate the degree of correspondence between the RNS score and the distance to each cluster center for the cases. With a value of 0.041, Kendall's tau – this time applied to a multivariate cluster analysis – again appears to be almost zero. Now we can state that multivariate subgroup analysis also shows that the correspondence between the ranking of the RNS scores and the background variables of age, gender, and education is insignificant.

3.7 Conclusions and discussion

This article has described the development and validation of the RNS-DLV, which is the Dutch-language version of an instrument to measure experienced residential nuisance. The initial analyses indicated that the RNS-DLV is a valid instrument. Although adequate, the instrument can be improved and refined by adding new items, especially to the second component, to get more reliable and valid subscales. Although the RNS is based on Dutch data sources, the potential utility of the scale and the findings arising from it have a wider application that can be of considerable interest to scientific researchers and policy-makers in other European countries.

The compact and valid instrument RNS-DLV is useful. It can serve as the dependent or the independent variable in more detailed research on the physical-spatial and sociocultural factors that relate to the reported frequency of nuisance in different countries, cities, and neighbourhood types. The RNS-DLV can help investigators conduct more selective and comparative urban, national, and European research on neighbourhood quality of life and the reported frequency of nuisance.

The article sheds light on the extent to which nuisance is perceived by Dutch residents and specifically on where the reported nuisance comes from. The first pattern detection in logistic regression analysis, with the RNS-DLV as the dependent variable and the individual scale items as the independent variable (as described in Table 3.7), demonstrated that litter on the street and noise pollution are the most significant contributing factors in the overall nuisance, which supports similar findings from UK. Apart from that, it was concluded that Dutch residents who occupy different dwelling types experience distinct kinds of nuisance. Other test results supported the hypothesis that people living in a post-war mid-rise neighbourhood experience nuisance significantly more often than people who do not live in a neighbourhood of that type. The different nuisance perception of subgroups is another indication of the need for extensive monitoring systems instead of stripped monitoring systems.

A brief subgroup analysis was performed. Univariate as well as multivariate subgroup analyses demonstrated that the degree of correspondence between the ranking of the RNS scores and the background variables of age, gender, and education is insignificant. Follow-up research with the RNS could reveal whether other subsets of residents tend to apply different standards when evaluating their residential environment. To what extent do young residents, married couples, female heads of household, and large families consistently report different levels of nuisance experience? Are their nuisance ratings tied to perceptions of criminality, run-down properties, and the similarity of neighbours in a different way? For example, follow-up investigations should consider whether ethnic minority residents tend to experience less nuisance than people of the majority population who live on the same block. This would build upon the findings of Sampson and Raudenbush (2004) in their study of perceptions of disorder – which in the present study is considered to be related to nuisance. Further analyses are needed to find out whether it is problematic that specific groups differ significantly in their perception and their frequency of nuisance experience. Moreover, further study is needed to determine the extent to which anti-social behavior underlies certain nuisances in the residential environment. In earlier work, the present author developed an outcome measure to define the degree of residential environmental satisfaction reported by residents. In a follow-up study, the RNS-DLV will be related to this residential satisfaction measure and its three subscales.

Planners and housing officials still want to know what, if anything, they can do to increase livability in neighbourhoods. The present article has demonstrated why this nuisance scale should be of interest to city and regional planners, city managers, researchers, and all those involved in urban policies in general but especially in urban regeneration activities in the Netherlands and other European countries. The RNS generates important additional information for policy-making on urban renewal and neighbourhoods in general

as part of a broader neighbourhood-monitoring instrument and as an independent indicator of the livability in residential neighbourhoods.

Comparison of the residents' perceptions with the opinions of other stakeholders (housing associations, municipalities, policy-makers) about the perception and the reported frequency of nuisance and other livability problems in (parts) of neighbourhoods can bring to light any difference of opinion between the stakeholders. So far, little has been published on ways to compensate negatively experienced attributes of the living environment by other residential attributes. Follow-up research should also consider the role that differences in residential lifestyle play. And the picture would not be complete without noting the constraints on residential choice that households experience. Both are important mediating factors in the way residents evaluate neighbourhood attributes. A fuller picture could then lead to more precise and probably more effective interventions in residential areas.

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4 The relationship between risk factors, nuisance and residential environmental (dis)satisfaction

C.C.M. Adriaanse. Submitted.

Abstract
When linking data on housing structures to deprivation and residents' dissatisfaction, certain physical-spatial neighbourhood types emerge as more problematic than others. But statistical outliers demonstrate that neighbourhoods based upon the same ideology and constructed on the same town-planning principles can develop differently, whereby one turns out problematic and another not. This paper builds upon results from earlier work on perception of the residential environment to investigate the relationship between physical-spatial, demographic and economic risk factors, nuisance and environmental (dis)satisfaction. Two conceptual models are tested in multivariate analyses (zero- and partial-order correlations) using quantitative data from a random sample of 75,034 Dutch residents. The outcomes show that human-derived nuisance in the residential environment is an important source of residential environmental dissatisfaction. The results will be of interest to researchers and all involved in urban policies in general but especially in urban regeneration activities in the Netherlands and other European countries.

Keywords
Environmental (dis)satisfaction, risk coefficients, nuisance, multivariate analysis, objective and subjective perspectives, neighbourhood types

4.1 Introduction

When we link data on housing structures to deprivation and residents' dissatisfaction, some physical-spatial neighbourhood types – notably, post-Second World War neighbourhoods – emerge as more problematic than others. In the Netherlands, as elsewhere in Western Europe, urban renewal policies are in place to restructure many post-Second World War mid- and high-rise neighbourhoods; some are already in the process of transformation. Ultimately, at the national level, the policies envision a normalized situation, which means: no physical disadvantages, a pleasant living environment without nuisance, no concentrations of deprivation, no tensions between residents, an average rentability or purchase price trend, and an acceptable image. By extension, the quality of the living environment is an important policy issue for local governments and housing associations (Schalkwijk, 2007; Ministerie van VROM, 2007a,b; Aedes, 2007; Shaw, 2004; Maclennan, 2006).

Entire libraries have been filled with literature about the prevalence of problems in mid- and high-rise estates, devoting considerable attention to the

background, causes and explanations of problems and to the effects of the measures taken. Relevant publications include Power (1997), Heeger (1993), Vestergard (1996), Schwedler (1998), Prak and Priemus (1986) and Turkington *et al.* (2004). But not every high-rise estate or post-Second World War mid-rise neighbourhood can be called problematic. The statistical outliers demonstrate that neighbourhoods that are based upon the same ideology and that are built according to the same town-planning principles can develop in a completely different way, whereby one neighbourhood turns out to be problematic and another does not.

In earlier work I introduced an integrative and more comprehensive approach to the measurement of residential environmental satisfaction and nuisance. A Residential Environmental Satisfaction Scale (RESS) and a Residential Nuisance Scale were developed. Residential environmental satisfaction appeared to be a global attitude of a resident (or household) towards his dwelling, the social climate of the neighborhood and the internal neighborhood reputation (Adriaanse, 2007). With the help of the RESS, it was discovered that especially in unproblematic neighbourhoods of vulnerable neighbourhood types, the social climate of the neighbourhood appeared to be an important success factor (Adriaanse, 2007).

The social climate of a residential environment I defined as an individual's expectation of how others will treat him or her, one another, and how they will treat the spatial artifacts within the area that the individual experiences as his or her living environment (Adriaanse, 2007, 2008a, 2010). The most critical element of a favourable residential social climate is determined not by the level of social cohesion – the intensity of social interaction – or by the homogeneity of the neighbourhood population, but rather by the degree to which diverse residents share norms such as civility and mutual respect (Adriaanse, 2004b, 2005, 2010). The present paper applies quantitative analysis to investigate the relationship between objective risk factors and subjective factors such as residential evaluation and the perception of nuisance in public and semi-public spaces. Nine objective risk factors are combined into a one-dimensional Risk Scale.

Urban reconstruction is high on the agenda in several Western European countries. Since this ambition involves huge amounts of money and has a great impact on the lives of thousands of residents, it is important to know how and where policies should be directed.

The theoretical section presents the two conceptual models and defines the main concepts (Section 4.2). The methods section describes the quantitative data from a random sample of 75,034 Dutch residents as well as the measures used for the analysis, two of which were formulated in my previous work (Adriaanse, 2007, 2008) (Section 4.3). In the results section, the two conceptual models are tested in multivariate analyses (zero- and partial-order correlations) (Section 4.4). The outcomes of the analyses are discussed in the

final section (Section 4.5). The insights offered in this article may be useful for urban policy, housing policy and neighbourhood renewal policy, particularly for finding a good balance of policies directed towards improving the overall liveability of neighbourhoods.

4.2 Theoretical framework

4.2.1 Characteristics and problems of early post-Second World War neighbourhoods

The parameters of the Risk Scale described in this article, include the typical characteristics of high-rise and mid-rise estates of the type common in the Netherlands and many other European countries. High-rise and mid-rise construction in the Netherlands began shortly after the Second World War. In countries such as France, Germany, the United Kingdom and the Netherlands, the majority of new housing at this time was in the social sector. Because of the acute housing shortage caused by war damage and the construction hiatus during the war years, it became essential to maximize housing production by reducing the variety of dwelling types, repeating construction patterns and using new architectural forms, such as the high-rise apartment building.

Besides being a means of resolving the housing shortage, high-rise construction can also be seen as an expression of planners' and politicians' desire to build in the tradition of the CIAM (*Congres Internationaux d'Architecture Moderne*) movement. According to Le Corbusier and the modern architects, high-rise served as a potent symbol of a 'new architecture for new people' in a modern age of multi-family living, communal facilities and social equality. In the eyes of architects, town planners and civil servants, high-rise was the symbol for this modern society. A number of design principles played a central role (Mentzel, 1990: p. 369): repetition, regularity and symmetry, the separation of functions, the use of open blocks, uniformity, straight lines, the large-scale nature of housing blocks and open spaces, the use of modern materials and building methods, and the provision of communal facilities.

The Dutch 1950s neighbourhood is typically a mix of low-rise apartment blocks and single-family homes, mostly in the rental sector. It is characterized by half-open blocks of buildings, arranged in a fixed pattern with a communal courtyard. The urban design rationale was strongly influenced by the CIAM philosophy, with much attention to light, air and space. Most of these dwellings had three or four rooms, with a total living space of about 50-60 m^2. They were designed to house young families and apparently this floor space was considered adequate at the time. Rents were generally low, though higher than in many pre-war rental dwellings. The high-rise units of the 1960s differed in their physical layout and were generally more luxurious. Facilities

such as central heating gave the new high-rise dwellings an initial qualitative advantage compared to earlier social rental dwellings, in which this luxury was not yet available (Mumford & Frampton, 2002).

From the early 1970s, many single-family houses were built in new suburbs, which addressed the needs of many household types, especially families with children. The suburban setting combined good-quality housing with an environment that was well suited to the 'family lifestyle' in that period of time. The booming Dutch economy resulted in higher wages and thus a greater number of people could now afford to purchase their own home. Many high-rise flats of the 1960s subsequently lost their tenants to the new suburbs and were unable to attract the middle-income families for whom they had originally been intended. In their place came renters with less choice in housing, many of whom relied on housing allowances to pay the rather high rents. The high-rise estates were not the most attractive residential settings. In periods of scarcity they enjoyed full occupancy, but when the market eased, as in the mid-1980s and late 1990s, vacancies occurred (Krantz *et al.,* 1999; Wassenberg, 2004).

The problems affecting the Dutch post-war housing stock have been described and categorized by many observers (cf. Heeger, 1992, 1993). The inexpensive social rental apartment blocks built between 1960 and the mid-1970s often dominate the housing stock in these neighbourhoods. As a result, low-income households with limited options are often obliged to rent these houses, while there is a selective out-migration of middle-class and higher-income households from these neighbourhoods. Apart from this, the liveability of many post-war neighbourhoods is also threatened by unpopular site design, pollution, social insecurity, the disappearance of neighbourhood shops, crime, vandalism, addiction to drugs or alcohol, and social tensions between different (ethnic) groups (www.keicentrum.nl). Significant local unemployment is also frequently cited as an indicator of a problem neighbourhood, as is the influx of children with an educational deficit, the departure of good pupils from the local schools, and ethnic tensions between various groups of residents. Finally, the problem neighbourhoods often suffer from a poor image among outsiders.

4.2.2 Risk factors, nuisance and residential (dis)satisfaction

One of the purposes of this article is to present a risk measure which is a scale. The advantage of a scale as a measure for the level of risk, above using separate parameters, is that a reliable and validated scale is a better technique in a socio-metric sense because it distinguishes clearly between the measurement error and the true scores. Moreover, a scale provides more information as it combines different variables that are interrelated and describe the same underlying construct – here, the degree of risk (Drenth & Sijtsma, 1990).

Risk factors put pressure on the social climate of the neighbourhood

Repeated interactions between neighborhood residents in the spatial environment produce a social climate (for definition see Introduction of this article). This subsection highlights some subtle processes of the interplay between respectively the physical-spatial artifacts of the residential environment and the reasons residents contribute to the cooperative social climate or not.

The residential area and its semi-public and public spaces are the spots where co-residents see each other and act and interact. At these spots the residents reveal, by the way they act, whether they are playing the mutual cooperation equilibrium or the mutual defection equilibrium. According to the behavioural economic approach – specifically the strong reciprocity thesis - in these actions positive and negative reciprocity are exchanged and altruistic punishment takes place (Camerer, 2003). In other words, in their residential environment residents can observe from each other whether they subscribe the same residential norms or a free-ride strategy is chosen. When community residents share norms that underlie any collective effort on their part to establish social order, a viable social climate is developed and maintained (Adriaanse, 2011).

Behavioural game theory is based on the concept of choice which implies that the individual chooses between free riding and normative behavior. Free riding can be considered as a choice to act in a rational egoistic way. However, individuals in their daily routines are not continuously taking conscious decisions. Choice is by definition intentional and reflexive. Allen (2005) states that pre-reflexive being is an important component of human existence. The concept of pre-reflexive being is additional to behavioural game theory because it is not about what one does, but in which way he does it (unintentional). It is perfectly possible that my 'pre-reflexive being myself', conflicts with the norms of other residents.

For example, due to certain physical characteristics of dwellings in anonymous and densely populated areas certain pre-reflexive behaviour can become a hindrance for co-residents. In a situation with a viable social climate co-residents will give me feedback in an attempt to make me aware of the consequences of my pre-reflexive behaviour, and by doing so making it reflexive. But suppose, due to cultural and linguistic barriers between native and non-native groups, co-residents cannot give me this kind of feedback. Then residents will not develop shared residential norms and thus nuisance will easily arise due a lack of altruistic punishment.

Newman (1972, 1979) already reported that the larger the apartment building or multiple-unit housing project, (...), the less social interaction takes place among neighbors, and the less sense of control is felt over both the interior and exterior public areas. Open areas that cannot be watched or observed by residents from their apartments, long dark hallways, poorly lighted stairways, and areas where no one is specifically responsible for monitor-

ing activities all reduce the levels of surveillance and the capacity for effective social control (Elliott *et al.,* 2006). Therefore public spaces with a low degree of inter-visibility of neighbors and high- and mid-rise apartment buildings with few doors connected to streets can have a negative effect on the degree of positive reciprocity and altruistic punishment and must be called risk factors.

In the seventies and eighties of the 20th century, in the Netherlands, new groups of starting households and non-native households – among whom a large share of Turkish, Moroccan and Surinamese origin – moved into the post-war neighbourhoods. The new socio-demographic 'mix' – consisting of elderly people who had lived there since the 1960s and the new households – didn't actually mix in most cases, which – in a lot of neighbourhoods - put more pressure on the social climate in these post-Second World War neighborhoods (e.g. Reijndorp, 2004; Dekker & Rowlands, 2005).

Nuisance and residential (dis)satisfaction

The curb appeal of dwellings, gardens, streets, and other the semi-public and public spaces is a manifestation of the norms applied by residents within the area and also of the degree of neighborhood efficacy. Also in a situation where people hardly know their neighbors, various cues – graffiti on the wall, dirt in the doorway, a supermarket trolley on the gallery, a radio that is switched on too loud, and other 'negative externalities' – are used to value the disposition of the neighbors (Adriaanse, 2011).

It is relevant to refer here to the Broken Window Theory (Wilson-Kelling hypothesis, in: McLaughlin *et al.,* 2003). This thesis suggests that neighborhood disorder is indicated by visible cues that residents perceive to be signs of the breakdown of social order and control (Ross & Mirowsky, 1999; Skogan, 1990). Skogan (1990) calls this the contagiousness of the problem of disorder: 'To the extent to which disorder becomes self-generative and feeds on itself, current levels of disorder produce future levels of disorder' (Skogan, 1990, p. 49). This may cause neighborhoods to decay and the quality of life of its inhabitants to deteriorate (Skogan, 1990).

In recent empirical research in the Netherlands, it was empirically demonstrated that when people observe that others have violated a certain norm or legitimate rule, they themselves are more likely to violate these and even other norms or rules, which causes disorder to spread (Keizer *et al.,* 2008). Thus, visible physical and social disruption is a signal that the mechanisms by which healthy neighbourhoods maintain themselves have broken down. If an area loses its capacity to solve even seemingly minor problems, its character becomes suspect. Residents are thought to read nuisance as a sign of disorder and as evidence of a deeper neighbourhood malaise, undermining personal health and trust (see Sampson & Raudenbush, 2004). Thus, through daily exposure to a threatening environment, where signs of disorder are common,

Figure 4.1 Model 1: Relation between risk factors and residential environmental (dis)satisfaction

residents may learn that other people cannot be trusted. They may view those around them with suspicion, as enemies who will harm them rather than as allies who will help them (Ross *et al.,* 2001, p. 568).

As stated in my earlier work, the social climate of the residential environment is the most influential component of global residential environmental satisfaction. Perceived frequency of nuisance will influence social climate, because it will change the expectations of residents and people tend to feel unsafe in neighbourhoods subject to pollution and vandalism (Adriaanse, 2008). Subsequently it can be expected that the perception of nuisance will influence the appreciation of the residential environment.

According to the literature vulnerability of neighbourhoods, nuisance and residential environmental dissatisfaction are related elements of one structure. We can distinguish objective factors such as the spatial, economic and demographic characteristics on the one hand and subjective factors such as residential evaluation and free-rider behaviour on the other hand. The relation between objective and subjective factors can be conceptualized in two different models (see Figure 4.1 and 4.2).

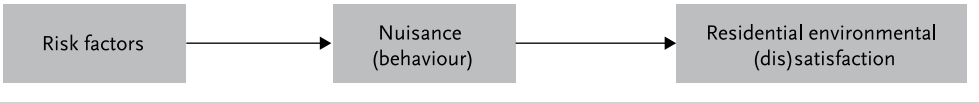
Model 1

The literature suggests that certain elements of the objective environment – such as percentage of single-family dwellings, proportion of immigrants, share of the housing stock that is not owner-occupied but private or social rental – are strongly related to the residents' levels of environmental (dis)satisfaction. Model 1 implies that these objective risk factors have a direct bearing on residential dissatisfaction. It suggests that politicians and housing companies should be aware that the greater the geographical concentration of risk factors, the more environmental dissatisfaction the residents are likely to experience.

Model 2

The assumption that the empirical relation between risk factors and residential environmental (dis)satisfaction also depends on a third variable, namely nuisance and disorder caused by residential behaviour, is depicted in the second model. Model 2 points to an empirical connection between risk factors and dissatisfaction; however, only an indirect association can be detected. It implies firstly, that residents living in a high-risk area are likely to report more stress associated by other residents than those residents not living in a high-risk area; and secondly, that stress associated by other residents is directly empirical connected with dissatisfaction. If the second model appears to be correct, this outcome will have considerable other and/or complementary political and practical implications.

Figure 4.2 Model 2: Relation between risk factors, nuisance and residential environmental (dis)satisfaction



4.3 Methods

4.3.1 Data

The analyses are based on national Dutch survey and registry data. The results of the 2002 national housing survey (Housing Demand Survey, 2002) were used along with data on the characteristics of the Dutch housing stock at the zip-code level. The latter were derived from the *ABF Woningmarktmonitor* (2003) and the Wegener data file (2002). The *Housing Demand Survey 2002* comprises a random sample of 75,034 Dutch residents. This survey, the successor to the general census of housing and population, has been held every four years since 1964, and its results are used to develop government policy. It provides information about household composition, housing situations, affordability, demand, and residential mobility. The survey includes questions on how residents feel about their living situation, the frequency of their perception of different types of nuisance and their evaluation of the residential environment. The theoretical insights mentioned above provided a framework for the initial selection of variables from the questionnaire of respectively the Housing Demand Survey, the ABF Woningmarktmonitor (2003), and the Wegener data file (2002). The analyses on the neighbourhood or zip-code level concern 3479 zip-codes with a mean of 21 respondents (minimum = 1; maximum = 418; standard deviation = 26).

4.3.2 Measures

The Housing Demand Survey 2002 is representative for the population of the Netherlands in 2002. Respondents completing the Housing Demand Survey had to give their answers in one of the following three forms: either "Do you agree with the following statement?", or "How satisfied are you with…?", or "Does it occur that …"

Twenty eight items of the national Housing Demand Survey were used to construct respectively the Residential Environmental Satisfaction Scale and the Residential Nuisance Scale (see Table 2.1 in Chapter 2 and Table 3.1 in Chapter 3).The Risk factors Scale is based on the ABF Woningmarktmonitor and the Wegener data file.

Residential Environmental Satisfaction Scale (RESS)

With respect to the Housing Demand Survey-questions that were used for the RESS, the respondents were asked to choose their answer from a five-point Likert scale (1-5) that was constructed as follows for the first form: (1) strongly agree; (2) agree; (3) neither agree nor disagree; (4) disagree; (5) strongly dis-

Table 4.1 Ratios used for the construction of the Risk Scale

Multi-family dwellings versus *single-family dwellings*
Native residents versus *immigrants*
Housing stock that is owner-occupied versus *housing stock that is social rental*
Housing stock that is owner-occupied versus *housing stock that is private rental*
Household income versus median household income
Property value versus median property value

agree. For the second form, the scale was as follows: (1) very satisfied; (2) satisfied; (3) neither satisfied nor dissatisfied; (4) dissatisfied; (5) very dissatisfied (Adriaanse, 2007). (See Table 4.1 for the 16 Housing Demand Survey items used for the construction of RESS). On the whole the sixteen scale items measure the same construct as suggested by coefficient Cronbach's alpha which was 0.86.

T-test shows that the RESS discriminates well between residents living in post-Second World War mid-rise neighborhoods and people living elsewhere. Because investigating a qualitative concept such as 'satisfaction' is a complex task, explorative factor analysis was used to identify different components of residential satisfaction. The factor analysis resulted in three factors which together accounted for 52% of the variance. The first factor was interpreted as the residents' general opinion about the neighborhood; the second as the residents' opinion about the residential social climate and the third about the dwelling of the resident (Adriaanse, 2007).

Residential Nuisance Scale (RNS)

With respect to the items of the Housing Demand Survey that were used for the RNS, the respondents were asked to choose their answer from a four-point Likert scale (1-3) that was constructed as follows: (1) never/hardly ever; (2) sometimes; (3) often (Adriaanse, 2008) (see Table 4.1 for the 9 Housing Demand Survey items used for the construction of RNS). On the whole the nine scale items measure the same construct as suggested by coefficient Cronbach's alpha which was 0.76.

A Kruskal-Wallis test shows that the RNS discriminates well between residents living in five different qualitative dwelling types. The typology of dwellings is as follows: (1) detached house, (2) semi-detached house, (3) corner house, (4) terraced house, (5) flat, apartment. The RNS-scale differentiates well between dwelling types constructed according to the price range and tenure type. Residents living in cheap social rental dwellings report a statistically significantly higher level of nuisance compared to residents living in owner occupied dwellings. The initial analyses indicated that the RNS is a reliable and valid instrument (Adriaanse, 2008).

Explorative factor analysis was used to investigate the different aspects of nuisance. The factor analysis resulted in two RNS-components. The first components are anonymous nuisances. The items that load on the second component represent non-anonymous nuisances. With respectively 0.70 and 0.67 as the alpha-scores of each component and a coefficient alpha of the total RNS of 0.76 (Adriaanse, 2008), it was decided to use the total RNS and not its subscales.

Table 4.2 Inter-item correlation matrix

	Income	Property value	Ethnicity	Ratio Home buyer/social rent	Ratio Home buyer/private rent
Property value	.86				
Native residents versus immigrants	.58	.55			
Ratio Homebuyer/social rent	.64	.60	.68		
Ratio Homebuyer/private rent	.54	.47	.70	.74	
Single-family/multi-family dwelling	.52	.49	.75	.74	.81

Risk Factor Scale (RS)

For this study I developed a uni-dimensional Risk Factor Scale (RS) and ran a reliability and validity study on it. The Risk Factor Scale is not an attitude scale like the RESS and the RNS. The RESS and RNS are Likert scales and as such have an ordinal level of measurement. The RS has a absolute level of measurement, consisting of, for example, percentages of residents living in specific dwelling types; percentage of native residents and immigrants and the percentage of the housing stock that is owner occupied. Six ratios were used to construct the Risk Scale; these ratios – all of their constituent items being percentages – are depicted in Table 4.1.

The procedure followed to construct the RS is to divide the difference of two percentages by their sum. The resulting ratios can be considered as the mean percentages relative magnitude of differences. Subsequently, the variables that were identified as risk factors of environmental distress, as derived from the literature, can be expressed with a value between -1 to +1. The next step is to calculate the reliability of the Risk Scale. Cronbach's alpha of the six Risk Scale items was 0.87; the standardized value of alpha was 0.91. The inter-item correlations varied between 0.47 and 0.83 (Table 4.2).

The validity of the Risk Scale was tested by Anova analysis with post hoc tests. As expected the scale clearly differentiates between high-risk and low-risk neighbourhood types ($F = 6463.57$; $df = 3$; $P = 0.000$). The mean scale values of the different neighbourhood types were as follows: post-Second World War -0.04; urban renewal +0.06; recent low-rise +0.4; all other types +0.35. Validity was also investigated by correlating the total Risk Scale with variables that, according to theoretical insights, are supposed to be related to risk. The variables used in the correlation analysis and their correlations with the Risk Scale are follows:

- % of pupils with low-educated parents at primary schools in the neighbourhood correlates -0.65.
- % of non-native pupils with low-educated parents at primary schools in the neighbourhood correlates -0.79.
- % of non-active heads of household correlates -0.52.

Thus, we may conclude that the reliability and validity of the Risk Scale are encouraging.

Principal component analysis was used to identify the underlying structure that accounts for most of the variance observed in the six manifest risk variables. A principal component analysis detected one single factor explaining 71% of the variance. We may also conclude that the Risk Scale is a uni-dimensional instrument.

Table 4.3 Zero-order correlations between risk factors, nuisance and (dis)-satisfaction

	Risk factor	Mean RNS
Mean RNS	-.76	
Mean RESS	-.69	.73

Table 4.4 First-order partial correlation coefficients

	Risk factor	Mean RNS
Mean RNS	-.51	
Mean RESS	-.31	0.44

4.4 Results

4.4.1 Levels of perceived environmental (dis)satisfaction

In an earlier article I developed a measure of 'residential environmental satisfaction'. The measure for the perception of environmental (dis)satisfaction is defined as the average degree of residential environmental (dis)satisfaction of residents at the zip-code level. The zip-code area comprises at least 100 households. Strictly speaking, Dutch 'postcode' areas (called zip-code areas here) do not exactly align with neighbourhood boundaries. Nonetheless, this article refers to these zip-code areas as neighbourhoods for the sake of convenience. The histogram in Figure 4.3 shows that the distribution of the RESS is symmetrical. A P-P plot confirmed normality. The characteristics of the normal distribution were a mean of 34.5 and a SD of 3.49. Further findings for the RESS total scale were median 33; modus 33; min/max 16 and 76.

4.4.2 Levels of perceived nuisance (RNS)

The measure for the perception of nuisance is defined as the average degree of nuisance of residents at the zip-code level. The histogram depicted in Figure 4.4 clearly shows that the distribution of the RNS is skewed to the right. The following values were found for the RNS total scale: mean 11.8; median 10.0; modus 8.0; min/max 8 and 24 (N= 65862) (Adriaanse, 2008).

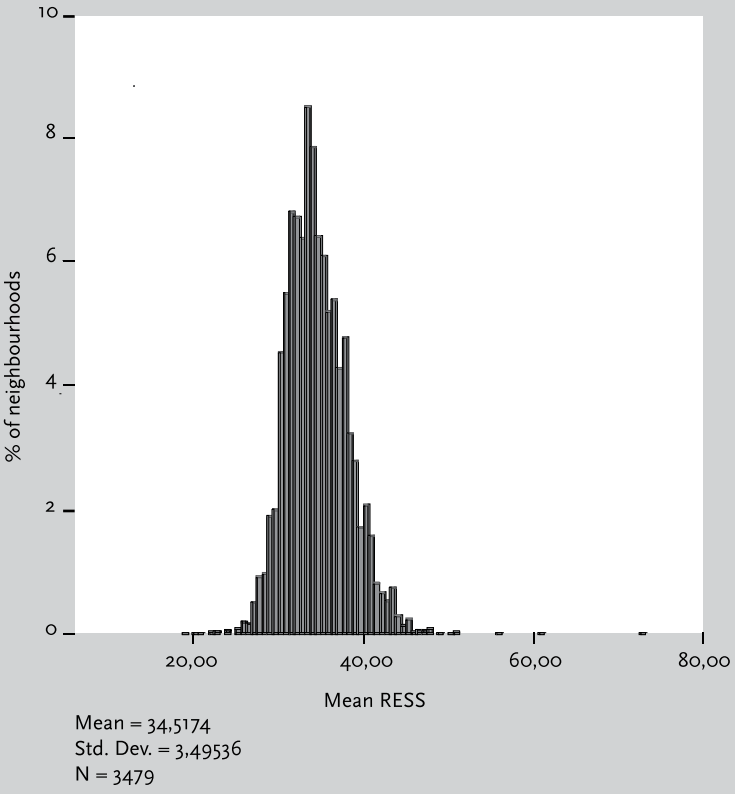
4.4.3 Distribution of the Risk Factor scale

The histogram in Figure 4.5 clearly shows that the distribution of the Risk Scale is strongly skewed to the left. The mean value of the Risk Scale is 0.32; min/max is -0.53/0.72; percentile 25 is 0.18; percentile 50 is 0.39; percentile 75 is 0.50.

4.4.4 Relationship between risk, nuisance and environmental (dis)satisfaction

In order to quantify the strength of the association between risk coefficients, nuisance and environmental (dis)satisfaction, I calculated all correlation coefficients and first-order partial correlation coefficients between the three vari-

Figure 4.3 Distribution of the mean 'residential environmental (dis)satisfaction' (mean RESS)



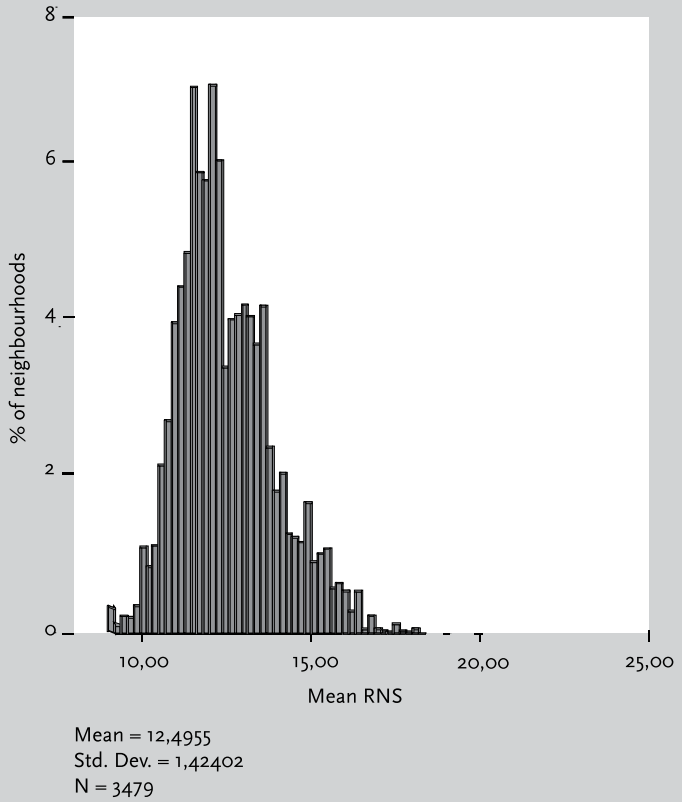
ables. The zero-order correlations between risk factors, levels of nuisance and residential dissatisfaction were as described in Table 4.3.

All correlations are statistically significant at the 0.001 level. Now, regarding the two models described in the first section, we can state the following. A zero-order correlation of -.69 between the risk factor and the RESS suggests that model 1 is correct (see Figure 4.6).

However, an analysis of the partial correlations suggests that model 1 is wrong. Table 4.3 depicts all first-order partial correlation coefficients. As we can see when comparing Tables 4.3 and 4.4, the correlation between the RESS and the risk factor changes significantly from -.69 to -.31. In the analysis of the partial correlations, it is assumed a priori that risk factors – which are objective variables – influence the subjective variables such as behaviour, as measured by nuisance and the perception of residential satisfaction. Nuisance and residential satisfaction are measured by questionnaires. Figure 4.7 describes Model 2 and suggests first a significant connection between nuisance and satisfaction (0.44, P = 0.00) when controlling for the effects of risk factors and second a significant correlation between risk factors and nuisance (-0.51, P = 0.00).

Thus model two means, the lower the score on the Risk Scale, the more nuisance is experienced and subsequently the more residential dissatisfaction is

Figure 4.4 Distribution of the mean 'reported nuisance' (mean RNS)



reported. In the next section I will answer the question which risk factors are associated with the experience of extreme nuisance.

4.4.5 Additional subgroup analysis

The Pearson correlation coefficient and the partial correlation coefficient describe a linear relationship. It appears to be important to examine correlation coefficients together with a detailed subgroup analysis since the same correlation coefficients can result from different underlying relationships. Next to that it is important to explore which risk factors are related to nuisance. First step in the additional analysis is to standardize the Risk Scale with the following algorithm:

Standardized risk value (rv) = rv + |minimum rv| / 0.1 (maximum rv + |minimum rv|).

Thus, for the Risk Scale the algorithm was rv + |-0.53|/0.1 (0.72 + |-0.53|) resulting in a linear transformation. To obtain an easy interpretable Risk Scale from 0 till 10, the transformed values were rounded on integer numbers.

Second step was to construct four equal groups on respectively the RESS and the RNS. The total resident sample of 75,034 was decomposed in to four

Figure 4.5 Distribution of the mean risk factor scale

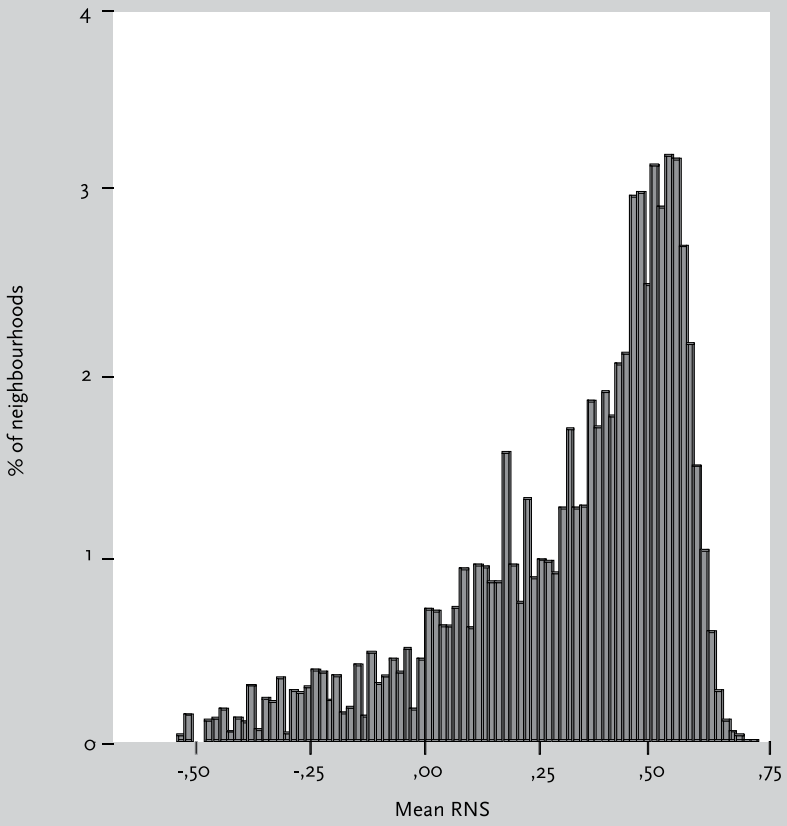
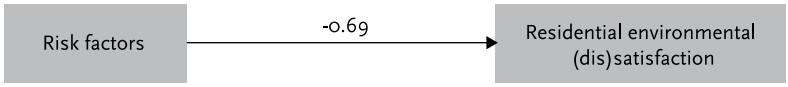


Figure 4.6 Model 1: Relation between risk factors and residential environmental (dis)satisfaction



equal groups using the 25th, 50th, 75th percentiles. The Tables 4.5 and 4.6 depict the quartiles of the RESS and the RNS in relation to the deciles of the transformed Risk Scale.

Tables 4.5 and 4.6 depict two ordered variables. A measure that can attain, or nearly attain +1 or -1 for any ordered r × c table is Kendall's tau-c. Kendall's tau-c for Table 4.5 describing the relation between RESS and Risk Scale was -0.60 (P = 0.000). Kendall's tau-c for Table 4.6 describing the relation between

Tabel 4.5 Relation between the RESS and the Risk Scale

Standardized Risk scale	% RESS 'very satisfied'	% RESS 'moderately satisfied'	% RESS 'moderately dissatisfied'	% RESS 'very dissatisfied'
0	0	0	0	100
1	0	0	2.1	97.9
2	0	0.8	21.4	77.7
3	0	3.2	21.9	74.9
4	0	3.8	33.8	62.4
5	3.9	16.3	23.3	56.5
6	4.7	19.0	36.7	39.6
7	13.8	27.5	40.2	18.5
8	37.8	36.0	21.0	5.3
9	60.9	28.8	8.6	2.2
10	47.7	46.6	0	5.7

Figure 4.4 Model 2: Relation between risk factors, nuisance and residential environmental (dis)satisfaction

RNS and Risk Scale was -0.63 (P = 0.000).

Inspecting the tables we can conclude that if we adopt a criterion for subgroup size of at least 30%, there is a significant group of very satisfied residents that don't experience any nuisance, when the Risk Scale has a value of at least 8.

Vice versa Tables 4.5 and 4.6 show that using the criterion of at least 30%, there is a significant group of very dissatisfied residents, when the Risk Scale has a value of 6 or lower. For the RNS the same tendency is found: Table 4.6 shows that using the criterion of at least 30%, there is a significant group of residents experiencing severe nuisance, when the Risk Scale has a value of 6 or lower. The interval between 6 and 7 on the standardized Risk Scale is of crucial importance and can be used to predict whether a significant group of residents is dissatisfied or experiences severe nuisance or not.

Taking the neighbourhood as the unit of analysis, I compared the deciles 0 and 1 (1) with deciles 8 through 10 (2) in order to investigate neighbourhood characteristics associated with dissatisfaction and nuisance. If we want to predict which neighbourhood characteristics are associated with extreme dissatisfaction and nuisance, we should focus on the deciles zero and one of the Risk Scale. If we want to predict which neighbourhood characteristics are associated with moderate to strong satisfaction and the absence nuisance, we should focus on the deciles eight, nine and ten of the Risk Scale.

Neighbourhoods with only dissatisfied residents are characterized by high population density, are dominated by relatively small dwellings mainly built in the period 1906-1960. The population in these neighbourhoods is dominated by immigrant groups. Compared to the neighbourhoods with moderately to strongly satisfied residents, the high risk areas have more singles, people in the age group of 20-34 and inactive household heads.

Table 4.6 Relation between the RNS and the Risk Scale

Standardized Risk scale	RNS 'no nuisance experience'	RNS 'hardly any nuisance experience'	RNS 'moderate nuisance experience'	RNS 'severe nuisance experience'
0	0	0	0	100
1	0	0	0	100
2	0	0	19	81.0
3	0.5	2.1	18.3	79.1
4	0	4.3	35.7	60.0
5	1.3	12.0	30.2	56.5
6	4.2	15.3	39.4	41.0
7	9.4	28.8	48.0	13.7
8	36.6	36.4	22.0	5.0
9	61.5	30.1	7.3	1.1
10	59.5	35.1	1.8	3.6

4.5 Conclusion and discussion

The present article demonstrates that the perception of nuisance in the living environment is an important additional guide to understanding residential (dis)satisfaction. The Risk Scale, the RESS and the RNS can be used on every level of aggregation – housing blocks, streets, neighbourhoods, cities- when connected to register data on the specific scale level. The results also demonstrate that certain physical characteristics of the environment inevitably lead to nuisance (Table 4.7). In Table 4.7 a description was given of the built environment where vulnerable households are concentrated. We can explain the extreme dissatisfaction and nuisance as follows: in anonymous and densely populated high- and mid-rise neighbourhoods with a lot of residents being underprivileged, we can expect that due to cultural and linguistic barriers especially between native and non-native groups, residents do not develop shared residential norms. Therefore, social control and altruistic punishment mechanisms are lacking.

In the analyses of this paper, first, thirty-four variables were reduced to three scales. Secondly, I investigated the relations between these three scales by calculating partial correlations. In addition, a detailed subgroup analysis was conducted. The aim of the analyses was to demonstrate the usefulness of a Risk Scale and to investigate to what extent neighbourhood characteristics cause nuisance and nuisance causes residential environmental dissatisfaction (Model 2). Subsequently, we can state that the processes and mechanisms that cause nuisance or prevent it can adequately be investigated by a monitoring system such as the Risk Scale that was described here. After determining the problematic areas on the specific aggregation level with the Risk Scale, residents can be asked to fill in the RESS and the RNS in order to analyze which problems can be detected. After quantitative research, more qualitative research methods are needed to gain insight in which types of behavioural mechanisms and social interactions on the block level and in semi-public spaces are responsible for specific types of nuisance and which feedback loops are active that create a negative social climate.

Nuisance triggers attributions and predictions not only in the minds of insiders, but it can also change the calculus of 'outsiders' like prospective homebuyers, real estate agents, insurance agents, investors, the police and

Table 4.7 Comparison of extreme risk groups 'All extremely dissatisfied' and 'Moderately to strongly satisfied'

Neighbourhood characteristics	Deciles Risk Scale 0 and 1 'All extremely dissatisfied'	Deciles Risk Scale 8, 9 10 'Moderately to strongly satisfied'
Building period	1906-1960 and 1981-1990	1960-2004 (minus period 1981-1990)
Flats with more than 4 floors	8%	1.8%
Flats with a maximum of 4 floors	28%	5%
Population density	6166 res./km²	1702 res./km²
Density of the housing stock	7286 houses/km²	1363 houses/km²
Terraced houses	16%	40%
Inactive head of household	46%	33%
Single	55%	26%
Age group 20-34	30%	18%
1,2,3 chamber dwellings	67%	17%
Immigrants	63%	12%

politicians, and it shapes the perceptions of residents who might be considering moving in. Further longitudinal research is needed to find out to what extent individual, household and neighbourhood variables influence the decision to leave the neighbourhood in case of decline.

Evidence of nuisance and disorder also gives a running account of the effectiveness of residents seeking neighbourhood improvement, and the record may encourage or discourage future activism. Further longitudinal investigations are needed to find out to what extent individual household and neighbourhood variables influence the decision of residents who haven't yet left their neighbourhood in case of decline, to behave in a pro-social manner towards co-residents and give face-to-face assurance and altruistically punish norm defectors? Another question to be answered in future research is to what extent the choice between leaving and contributing to the neighbourhoods viable social climate influence the rates of ethnic minorities, poverty and physical deterioration in the neighbourhood?

In this article the micro mediation between residents' perceptions, attributions and actions was not explicitly investigated because the RESS and the RNS describe attitudes which are the resulting effects of such micro mediations. The parameters used for the Risk Scale identify variables on the micro level of the neighbourhood. Allen (2005) discusses micro-mediation which he relates to pre-reflexive behavior. Allen for example emphasizes that soft drugs use and criminal activity can only be explained via recourse to pre-reflexive reasons. Following Heidegger, in our practical concerns with 'getting on with things' we behave in an 'average everyday' mode of being (Allen, 2005).

In this article resident's opinions and risk factors were described on the average neighbourhood level. In pre-reflexive terms the average is 'What comes naturally' or 'Just happens because we can expect it' (Allen, 2005, p. 201). Epistemologically, I argue that correlations and averages between items of an attitude scale describe what Heidegger calls 'Das Man' (Heidegger, 1926, p. 126). I argue that Allen's 'the neighbourhood-they-self' (Allen, 2005, p. 204) is the Heideggerian 'Das Man'. Following this line of thought I use the neighbourhood average of an opinion scale, as the best approximation of 'Das Man' and 'the neighbourhood-they-self'. This is where statistical thought and phenomenology meet (Merleau-Ponty, 1945, p. 504). I invite fellow researchers

and policy makers to use the objective parameters that are already available, for the construction of their own risk scale and to use the RESS and the RNS to identify high risk streets, blocks or micro-neighbourhoods and subsequently investigate the micro-mediation of problems in these specific environments.

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5 The importance of norms: behavioural game theory as a tool to understand neighbourhood events

Carlinde Adriaanse, Housing, Theory and Society, 28 (1) Routledge.

Abstract
A neighbourhood's viability depends strongly on the willingness of its residents to intervene. According to Mancur Olson's free-rider theorem, collective action will neither be initiated, nor sustained unless it is found profitable by every single participant. This 'n-person prisoners' dilemma' indicates that the successful cases of cooperation, not the failures, call for an explanation; this is the theoretical starting point for a study of resident interactions in the viable Dutch mid-rise post-Second World War neighbourhood Buitenveldert-Amsterdam. This article attempts to show that behavioural game theory is appropriate for the description and explanation of the reasoning and behaviour of residents who perceive collective good games. The deductive methodology known as analytic narrative is used to blend behavioural game theory and narration into the study of liveability problems. The results indicate that social norms are important as determinants of 'what types of games residents play', which in turn determines the degree of cooperative behaviour and the effectiveness of social control in a neighbourhood.

Keywords
Residential interactions, behavioral game theory, collective neighbourhood goods, trust, norm-oriented, interactive behaviour

5.1 Introduction

In an earlier work it was demonstrated that residential environmental satisfaction is expressed not only as satisfaction with the dwelling or in the internal neighbourhood reputation. Rather, it is mainly revealed by people's evaluation of the social climate prevailing in their neighbourhood (Adriaanse, 2007). The social climate of a residential environment is defined as an individual's expectation of how others will treat him or her, one another, and how they will treat the spatial artefacts within the area that the individual experiences as his or her living environment (Adriaanse, 2007, 2008a). The most critical element of a favourable residential social climate, that is, one that is appreciated by its residents, is determined not by the level of social cohesion – the intensity of social interaction – or by the homogeneity of the neighbourhood population, but rather by the degree to which diverse residents share norms such as civility and mutual respect (Adriaanse, 2004b, 2005).

Moving away from a focus on private ties, because of the changes in urban reality (Blokland, 1998; Fischer, 1982; Putnam, 2000; Wellman, 1979; Wellman & Leighton, 1979), this paper focuses on mechanisms that facilitate residential cooperation on behalf of the collective neighbourhood goods without requiring strong ties or associations (Olson, 1971). This article attempts to show that the insights and tools of behavioural game theory (Camerer, 2003) are sufficient for the description and explanation of the behaviour of residents in neighbourhoods. The central question is: what mediates the resident's willingness to contribute or not to the production and maintenance of collective and public residential goods such as clean shared entrances and stairways, well-maintained collective gardens, and public goods such as clean and safe streets and parks (Olson, 1971)?

The main thrust of this article is the development and application of a theoretical framework that explains the proximate causes of liveability problems in neighbourhoods. This entails the precise analysis on a micro level of the underlying causal mechanisms that determine the reasoning and behaviour of residents who perceive collective good games. The point of departure is methodological individualism, which states that individual choices of residents determine whether or not on an aggregate level liveability problems in neighbourhoods will occur. The theoretical framework relies on behavioural game theory and especially on the strong reciprocity thesis. It will be questioned whether the conventional theory of collective action, telling us that individuals are inherently self-seeking (Olson, 1971), gives a reliable description of actual behaviour of people in neighbourhoods.

The field of mathematical game theory came into being with the 1944 book *Theory of Games and Economic Behavior* by John von Neumann and Oskar Morgenstern. The power of game theory is its generality and precision.[1]

Rational choice theory, in particular the theory of games, offers a theory of structure: it suggests a way in which structures create incentives that shape individual choices and thereby collective outcomes (Bates *et al.*, 1998: 234).[2]

In *Strategic Interaction* Erving Goffman states that game theory identifies an area of social life that sociology has more or less missed, namely situations in which actors are mutually aware of each other, where every move that someone makes affects all the actors, and where the decision that Actor A makes depends on what Actor B thinks that she will do (Swedberg, 2001). Games describe different situations of interacting entities and provide a taxonomy of strategic situations. Three games are well known in the social sciences: the

1 The theory was developed extensively in the 1950s by many scholars and explicitly applied to biology in the 1970s. Mathematical game theory has been widely recognized as an important tool in many fields.

2 A core concept of game theory is the Nash equilibrium (Voss, 2001: 105).

Prisoner's Dilemma, the Trust Game or Assurance Game, and the Battle of the Sexes. All three of these games can be applied to the behaviour of residents.

Two major criticisms of game theory are, first, that it assumes more calculation, foresight, perceived rationality of others, and (empirical applications) self-interest than most people are naturally capable of; and, second, that in most applied domains there is too much theorizing about how rational people would interact strategically, relative to the modest amount of empirical evidence on how they do interact (Camerer, 2003: 465). Because of these criticisms I focus in this paper on behavioural game theory, which starts from bounded rationality; secondly I define the social dilemmas in terms of intentions not in terms of outcomes.

Also Bo Bengtsson uses a game-theoretical framework for the study of tenant involvement in Swedish housing estates (Bengtsson, 1998, 2001). The empirical analysis in Bengtsson's project was carried out on the estate level; in the paper at hand the empirical analysis is carried out on the individual level. In this article I use behavioural game theory as the conceptual framework for the narrative interpretation of descriptions of social interactions in a neighbourhood context. The case study focuses on a post-Second World War neighbourhood, namely Buitenveldert-Amsterdam in the Netherlands. It is a viable neighbourhood with a good reputation and a favourable social climate, even though its physical-spatial layout bears the characteristics of a 'vulnerable' neighbourhood type (Adriaanse, 2004b, 2006). Section 5.2 develops the theoretical framework, in which norms, trust and dominant response tendencies serve as the main elements, using Elster's distinction between respectively moral norms, quasi-moral norms, and social norms (Elster, 2007). Section 5.3 deals with the methods used. A profile of the case-study district, Buitenveldert-Amsterdam, is presented in Section 5.4, which includes a subsection on the characteristics of the post-Second World War neighbourhood type. The sample characteristics are presented in Section 5.5. Then, in Section 5.6, the empirical results are described in relation to the prevalence of Prisoner's Dilemmas and Assurance Games, the prevalence of altruistic punishment and reported negative externalities, and respondents' descriptions of the social climate of Buitenveldert. The article closes with a section comprising the conclusions and a brief discussion.

5.2 Theoretical framework

In past times, the smaller scale and the higher frequency of interactions among individuals in classic community settings such as the church, the neighbourhood or the schoolyard prevented residents from becoming 'intimate strangers'. Nowadays communities are less close-knit, and the importance of the neighbourhood as a framework for social and spatial integration

has declined due to macro developments of mobility, globalization and modernization processes in the economy and employment (Blau, 1986; Gans, 1961; Keller, 1968; Offe & Fuchs, 2002; Paxton, 1999; Suttles, 1972; Völker, 2004; Adriaanse, 2004b, 2006). Subsequently, traditional loci of bonds such as religion, neighbourhood and work have become less influential settings for the development and maintenance of social norms and moral attitudes (Adriaanse, 2006). A sense of insecurity about the actions of those (unknown) others in residential areas can easily occur because nowadays the inhabitants do not necessarily know each other (e.g. Dekker & Rowlands, 2005; Reijndorp, 2004).

People who occupy mid-rise and high-rise buildings in particular live close together in large numbers within a relatively small area. While they may not occupy the same worlds in a social sense, they do share the same physical space, which they call their living environment. They 'come across each other' or 'run into each other' in the elevator, on their way to the neighbourhood shops, and in other spaces outside of their homes. In contrast to the social interactions in small rural communities or immigrant ethnic enclaves (Forrest & Kearns, 2001), these coincidental encounters in shared (semi-)public space can be characterized as 'interacting without meeting' (Adriaanse, 2006).

Residents are assumed to want to live in a safe and clean neighbourhood, free of crime, vandalism and nuisances such as dirt on the street, noise and so forth (Adriaanse, 2008b). After all, there is no evidence of which we are aware showing public approval of crime or disorder by any population group (Sampson & Raudenbush, 1999). The term collective efficacy is important here. Collective efficacy – defined by Sampson and Raudenbush (2004) as cohesion among neighbourhood residents combined with shared expectations for informal social control of public space – is considered a major social force inhibiting both crime and disorder. The starting point of this article is that friendship networks are not considered a necessary condition for a stable and viable community, whereas avoiding nuisance and sharing the common standards that underlie collective efforts to establish social order and safety are (Sampson, Raudenbush & Earls, 1997; Sampson, Morenoff & Earls, 1999).

5.2.1 Norms and trust

Collective efficacy is about the expectations for actions that are essential for the realization of public goods, such as public safety, clean environments and education for children (Sampson, 2003). 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. Collective

efficacy is rooted in selfefficacy (Bandura, 1986: 449).[3]

Achievement of collective efficacy requires cogent means of relating factional interests to shared purposes. The unifying purposes must be explicit and attainable through concerted effort (Bandura 1986:453). Which are the mechanisms that facilitate residential cooperation on behalf of the common neighbourhood good, without requiring strong ties or associations?

Norms

Cooperation in human societies seems to be grounded in norms; thus, it is necessary to explain norms to be able to understand human cooperation (Fehr & Fischbacher 2004:185). According to Emile Durkheim, norms are social facts (*faits sociaux*), outcomes of actions, and, as such, they are collective phenomena. He says that norms exist independently of the consciousness of individuals; they are objective and causally relevant if they are enforced within a community or group of actors (Hechter & Opp, 2001). Durkheim does not analyse the logic of the interaction that leads to norms. A group in which norms exist can be a family, a peer group, (part of) a neighbourhood, an organization, or even a whole society. We can distinguish two aspects of norms that are crucial: (1) the norm as a standard to judge the behaviour of others; (2) the norm as a tool to control one's own behaviour.

Regarding the first aspect, certain scholars state that norms are standards of behaviour that are based on widely shared beliefs about how individual group members ought to behave in a given situation (Ellickson, 2001; Elster, 1989; Horne, 2001; Voss, 2001). With an emphasis on enforcement, norms can be defined as behavioural regularities in a population of actors. Some metaphors that have been used to describe this first aspect of norms are 'the rules of the game' (Hechter & Opp, 2001), 'the internal morality of a social system' (Coleman 1990), 'the cement of society' (Elster, 1989), and 'the basic values that shape beliefs' (Collins & Chippendale, 1991).

The second aspect of norms reflects the degree to which individuals agree to mediate or control their own behaviour. According to Weber (1978: 755) an individual may change his behaviour and especially his social actions, either to protect his interests under new external conditions or simply to promote them more effectively under existing conditions. Actors may actively calculate the course of action that is most likely to produce desired ends at the lowest costs, or they may more passively simply imitate those around them (Asch, 1956; Sherif, 1936). Other key social science thinkers would however describe the norm in quite different terms and adopt a much more critical

3 Among the various aspects of self-knowledge, self-efficacy involves a generative capability in which cognitive, social, and behavioural subskills must be organized into integrated courses of action to serve innumerable purposes. Competent functioning requires both skills and self-beliefs of efficacy to use them effectively (Bandura, 1986).

approach (i.e. Foucault). But in this article the starting point is that human deliberations are a phenomenon sui generis and not the product of for example power relations.

Trust

Closely related to norms is the concept of trust. As a first approximation, trust may be defined as the expectation that another player will not defect in a sequential Prisoner's Dilemma. Sztompka defines trust as "a bet about the future contingent actions of others". A functional culture of trust, as Sztompka calls it, includes strong norms with positive sanctions motivating trustworthiness, and strong taboos with negative sanctions prohibiting breaches of trust (Sztompka, 1999: 111-112). Trust encourages cooperative behaviour by creating a social obligation: "trust in someone engenders reciprocal trust" (Sztompka, 1999). Trusting people enter relationships with the presumption that others can be trusted. Because trusting individuals can form effective associations with others, the presumption of trust can be an advantageous strategy, despite the risk of investing while others neglect to do so (Molm, Takahashi & Peterson, 2000; Orbell & Dawes, 1991; Sullivan & Transue, 1999). This refers to the first aspect of the definition of norms. Once trust becomes embedded in a cultural, normative system, it acquires functions and dysfunctions of its own. A trust-generating atmosphere encourages cooperation and community (Sztompka, 1999).

Sztompka treats the concept of distrust as the negative mirror-image of trust. It is a negative bet. "It involves negative expectations about the actions of others (…) and it involves negative, defensive commitment (avoiding, escaping, distancing myself, refusing actions, taking protective measures against those I distrust)" (Sztompka, 1999: 26). Not able to predict the future conduct of those who are different from us, we react to such uncertainty with suspicion. Sztompka also introduces the term 'mistrust' to refer to a neutral situation in which both trust and distrust are suspended. "It means the lack of clear expectations, as well as hesitation about committing oneself" (Sztompka, 1999: 26). Distrust is often pervaded with stereotypes and prejudices (Sztompka, 1999: 42).

Elster's (2007) distinction between different types of norms, combined with the latest insights of behavioural game theory, could shed light on when norms emerge and when they lead to cooperation or to defection. This will be described in the following sub-sections.

5.2.2 Response tendency without norms

For neighbourhoods, it seems clear that neither a situation of experienced mistrust nor a situation of experienced distrust is favourable. Both seem to pose a serious threat to the quality of life of the residents. A response tenden-

cy or an interpersonal preference is the predominant way in which one generally chooses to act in interaction situations (Elster, 2007: 188). In an ideal situation, community residents share norms that underlie any collective effort on their part to establish viability, social order and safety. When residents assume that there are shared standards for neighbourhood behaviour, they are less likely to have proximity problems. Shared standards for neighbourhood life facilitate the management of neighbourhood problems by providing a clear measure against which behaviour can be judged (Altman & Wandersman, 1987: 59). In this section, the game-theoretical approaches to norms are discussed, as they are the engine of collective efficacy and mutual trust. The discussion uses Elster's distinction between moral norms, quasi-moral norms and social norms (Elster, 2007). The respective games that are presented will be clarified by examples.

Rational egoism without norms

When do norms emerge? According to a widely shared (Coleman, 1990) but not uncontested (Elster, 1989) view, the request for a norm starts when actions cause positive or negative externalities for other people (see also Fehr & Fischbacher, 2004: 185). Even if agents are informed about the norm's content and accept the norm as valid, they do not necessarily conform to the norm (Hechter & Opp, 2001: 108). Because people repeat strategies that produce positive outcomes, they can systematically break the norm because of the temptation to achieve a better personal result. Individuals will recall actions successfully applied in earlier situations and behave similarly under new conditions (Dobbin, 1994).

The clash between the normative standards of a social system and the individual choice to seek personal material gain or hedonistic success is well described in the form of a Prisoner's Dilemma (PD). In a PD, any individual contribution generates small benefits for many people and large costs for one person – the contributor. Although the sum of all contributions exceeds the costs, implying that there is a collective interest in contribution, the costs typically exceed the benefit to the contributor, so there is no individual interest in contributing. In other words, the effort that is expected from an actor in order to serve the norms does not contribute to the realization of the actor's personal material and hedonistic goals.

Because a PD is symmetric, the inequality holds for every participating agent. The preference order means that every participating agent will avoid option (N,S) and try to arrange situation (S,N) (see Table 5.1). As the inequality is applicable to every agent in a PD, the collective result is not optimal (S,S). When all participants in a PD change their strategies until no participant can benefit from changing, an equilibrium in the PD arises: situation (S,S). A PD has only one equilibrium and predicts universal noncooperation. According to the logic of a PD, self-interested people are just norm violators. The follow-

Table 5.1 Standard structure of a Prisoner's Dilemma With inequality: (S,N)>(N,N)>(S,S)>(N,S).

		Others (They)	
		N	S
I (We)	Normative behaviour (N)	3,3	1,4
	Self-interest (S)	4,1	2,2

ing situation gleaned from an interview illustrates a typical PD. Briefly, when people moved out of the neighbourhood, they left behind some empty boxes on the street. Other residents were annoyed about the fact that the boxes had not been folded up and put in the paper recycling bin.

Example 1: Prisoner's Dilemma – Neighbour moving out chooses rational egoistic option by leaving behind empty boxes on the street (see Table 5.1, option (S,N)).

> "(...) I think it is simply annoying, look I don't like it when people make a mess of the neighbourhood. When there are seven boxes lying on the pavement because they moved out, and they just refused to read the circular that you have to fold them up and put them in the container, then you are just lazy. And that is really what bothers me. And I have often written letters about that, and sometimes it helps and sometimes it does not."

5.2.3 Norm-oriented interactive behaviour

Experimental evidence shows that in an anonymous one-shot (simultaneous) Prisoner's Dilemma, 30-40% of the individuals have a rational egoistic response tendency, ignoring norms. This leaves 60-70% of the individuals who tend to follow more complex strategies involving some levels of trust and reciprocity (Frey & Benz, 2001).[4]

Prisoner's Dilemmas do not adequately describe the differences in motivation of non-cooperative persons. For instance, in a classic PD, I could decide not to travel by train because, as my rational egoism prescribes, I have to go by car, or because I see that others do not use the train either. Then it is not reasonable that I should have to travel in any less comfort! This motivation differs significantly from rational egoism. Game theoreticians and researchers in the field of behaviour economics have put forward the concept of 'strong reciprocity' (Gintis *et al.,* 2005) in this context. A reciprocal person does regard it as reasonable to help others but also applies this standard to actions of others towards him. Over time, individuals develop a friendly attitude towards each other as a result of mutual assistance, not as its cause. In the following sections, these other motivations or norm-oriented choices are described, and for each of them the preference order is depicted by a specific 'game'. In the first response tendency, moral norms are central. In the second one, people follow quasi-moral norms. The third response tendency is based on 'social norms'.

4 Behavioural game theorists rely on data gathered in controlled laboratory and field environments to make assertions concerning human motivation (Gintis, Bowles, Boyd & Fehr, 2005).

Moral norms

An action H is moral if and only if the consequences of action H in situation S are at least as good as any other action that an individual could have taken in situation S. The person who has a tendency to act in a moral manner adopts a decision-making procedure that ensures that he allows the best consequences to be determinant in his deliberations.

An action is based on a moral norm when it confers benefits upon other members of a group even at a cost to the actor. Altruistic action dictated by a moral norm is unconditional, whereas it is 'pushed' from behind by a quasi-internal force, insensitive to circumstances, sticking to the prescribed behaviour even if new options become available (free after Elster, 1989: 97). The moral norm of altruism is to help others in distress unconditionally, even if there is no prior history of assistance. A person who acts upon a moral norm will feel shame and guilt when he does not cooperate – i.e. does not conform to that norm – whether another person can see his act or not.

Quasi-moral norms

An action H is reasonable if and only if the consequences of action H in situation S are at least as reasonable as any other action that an individual could have taken in situation S. The person who has a tendency to act in a reasonable manner adopts a decision-making procedure that ensures that he allows the most reasonable consequences to be determinant in his deliberations. This orientation may be classified as quasi norm-oriented.

Like defecting from moral norms, also defecting from quasi-moral norms generates a sense of guilt regardless of whether other people are present or not. After all, even when I know others haven't seen my act, I feel guilty when reflecting on it. Elster states that quasi-moral norms are conditional, in the sense that they are triggered by the presence or behaviour of other people.[5]

What Elster calls quasi-moral norms would include the norm of reciprocity (help those who help you and hurt those who hurt you). We can distinguish between positive and negative reciprocity (Fehr & Gächter, 2002). Positive reciprocity consists of respect, trust and tolerance. You won't be tolerant of another person if he is not tolerant of you. A form of negative reciprocity is altruistic punishment or social sanctioning. An individual has the tendency to be reciprocal if he is prepared (1) to reward those who act reasonably (strong positive reciprocity) by acting reasonably himself; or (2) to pun-

5 Social norms, he argues, are triggered when other people can observe what other people are doing. But I want to refine this argument. Only when I know that other people have observed what I am doing do I feel ashamed. For example: If I see that others help to clean the street and I don't, I feel uncomfortable (guilt). This is a situation with a quasi-moral norm that occurs in a situation with the characteristics of an Assurance Game. Quasi-moral norms are subscribed to by the majority.

ish (Fowler, 2005) those who are unreasonable (strong negative reciprocity). Altruistic punishment is directed toward norm offenders. It is called altruistic because of the costs it takes to punish deviance. The costs associated with punishing others include the risk of retaliation or at least potential loss of relationship, the loss of time or money, emotional discomfort and so forth.

An example of altruistic punishment is described in the following quotation. Example 2: Altruistic punishment. Woman (age 56) lives in a social rented house in an apartment building:

> "When I see it I will say something about it of course! We have a girl living here and she is picked up every morning by a taxi that brings her to her school; she has a certain disease. While waiting she smokes on that bench downstairs and she drops her fags on the ground. I tell her not to throw her fags on the ground, but she doesn't realize herself that she misbehaves. Yes and now she has stopped doing it. At least, that is what I hope, because I don't see her do it anymore. Yes, I think that is just dirty."

Fehr and Gächter (2002) found in experiments that cooperation flourishes if altruistic punishment is possible and that it breaks down if altruistic punishment is ruled out. An essential condition for strong reciprocity is that punishment also takes place without leading to future advantages for the reciprocating individual. A strongly reciprocating individual punishes a person who does not adhere to the norm, even if doing so costs this individual more than he or she may gain from it. This reciprocity is derived not from an egoistically defined instrumental form of rationality but rather from a perceived sense of values.

Very important is the fact that quasi-normative choices change a Prisoner's Dilemma into an Assurance Game (AG) (see Table 5.2 for the matrix of an assurance game). In game theory, the Stag Hunt is a game that describes a conflict between safety and social cooperation. Other names for it or its variants include 'Assurance Game', 'Coordination Game', and 'Trust Dilemma'. It originates in a text by Jean-Jacques Rousseau, who described a situation in which two individuals go out on a hunt. Each can individually choose to hunt a stag or a hare. Each player must choose an action without knowing the choice of the other. If an individual hunts a stag, he must have the cooperation of his partner in order to succeed. An individual can get a hare by himself, but a hare is worth less than a stag. This is taken to be an important analogy for social cooperation. The Assurance Game differs from the Prisoner's Dilemma in that there are two Nash equilibria: one when both players cooperate and one when both players defect. In the Prisoner's Dilemma, however, despite the fact that a situation with both players cooperating is Pareto-efficient, the only Nash equilibrium is when both players choose to defect (Camerer, 2003). In a game-theoretical Trust Game matrix, the choice is between the same strategies – normative behaviour (N) and self-interest (S) –

Table 5.2 Standard structure of Assurance Game with inequality (N,N)>(S,S)>(S,N)>(N,S)

		Resident 2	
		N	S
Resident 1	Normative behaviour (N)	2.2	0.1
	Self-interest (S)	1.0	1.1

as in the PD example. Again, the preference order is given in ordinal numbers.

The outcome is indeed a non-excludable public good like a clean street. However, we assume in an AG that every resident contributes a small but essential part to a collective good. Individual contributions generate a large benefit for a well-defined group of people. Individual costs can be large, but they do not exceed the benefits to the contributor. An AG generates two equilibria: (N,N) and (S,S). In other words, residents prefer to contribute (N,N) if they believe others are inclined to contribute; but they prefer to defect if they believe that others are inclined to defect. If, for whatever reason, some residents conclude that those around them will help sweep the street clean, they respond by contributing in kind, prompting still others to contribute and so forth and so on until a highly cooperative state of affairs takes root (Marwell, 1988). But if some residents conclude that others will benefit from a situation they are struggling to bring about, though without contributing, then they will respond by acting out of self-interest too, spurring others on to do the same and so forth and so on until a condition of mass non-cooperation becomes the norm (Camerer, 2003). A typical example of an AG is where there is no discrepancy between the personal goals and the collective goal and all residents are willing to deliver an essential contribution. In an interview, one respondent recounted what happened when the key to the gate of the collective garden was broken, and all residents paid part of the repair costs.

Example 3: Assurance Game. All residents cooperate in paying the repair costs of the collective garden gate (see Table 5.2, option (N,N)).

> "Recently the key to the gate of the collective garden was broken. The neighbour next door had put the key in the lock and then it broke off. But yes, that went very smoothly then, when he said "I will call a locksmith." Then everyone paid 7 euro each to have a new key made. That kind of thing – nobody makes a problem of it – goes really naturally. As long as somebody just takes the initiative, yes, in my view everybody will cooperate."

Social norms

Social norms have to do with status, personal preference and taste, and they include rules of etiquette and norms regulating aggression. Taste bears the characteristic of a convention equilibrium because it is arbitrary or indiscriminate. But the difference from a convention equilibrium is that the latter has been agreed among the members of the collective and taste has not! You cannot make your own taste absolute and unconditional, because it would be exclusive and discriminatory. Social norms can also differ between identity groups such as socio-cultural and religious groups or across generations (Sen, 2006).

So, a person who does not subscribe to the definition of the norm because he or she has other priorities cannot necessarily be seen as a non-mor-

Table 5.3 Standard structure of a Battle of the Sexes game

		Resident 2	
		(A)	(B)
Resident 1	Normset (A)	3,2	0,0
	Normset (B)	0,0	2,3

With inequality for resident 1: (A,A)>(B,B)>(B,A)=(A,B) (= 'mistrust').
With inequality for resident 2: (B,B)>(A,A)>(B,A)=(A,B) (= 'mistrust').

al norm violator. He could have his own inwardly felt definition of the norm based on different taste. Community members often have different interests. That is, the costs and benefits for one person or set of people are different from those of another (see for example Ermakoff, 1997; Heckathorn, 1993). In these situations, norms are disjoint (Coleman, 1990). Some group members want to impose their preferences on others, and there are disagreements among subgroups about what the social norm ought to be. Under such conditions, contradictory norms will emerge, or the group with the strongest interest will succeed in having the social norms that benefit it prevail (Horne, 2001: 17).[6]

Within-group solidarity can thus help to feed between-group discord (Sen, 2006: 2). Social norms can also be treated as a game with a pay-off matrix; one such is the Battle of the Sexes, a twoplayer game used in game theory. Imagine two households living next to each other; one has social normset A and the other normset B. Normsets A and B are incompatible. Both would prefer to keep their relationship stable. But if they don't agree, what should they do? The pay-off matrix labelled Battle of the Sexes is shown in Table 5.3.

It is even possible that in the same social interaction situation, both games – the Battle of the Sexes and the Assurance Game – are intermingled. This is the case in the next example.

Example 4: Assurance Game and Battle of the Sexes. Cooperative interaction under pressure because of differing social norms (see Table 5.2, option (N,N); Table 5.3, options (B,A) and (A,B). A native Dutch lady (age 35) has lived with her husband and two young children in Buitenveldert for four years in an owner-occupied semi-detached dwelling:

> "Yes, I was criticized for that: 'Could you please trim the hedge', my neighbour said. We do only a little gardening, it's not a priority for us and we don't have very much time for it either. (...) When it is really necessary to trim the hedge, it is an unwritten rule, we do it by turns, it is a hedge so you do it on both sides, you do not say, 'I will only trim it on our side', but they do it far more often than we do, yes, and then I feel troubled."

First, the woman wants to contribute to the maintenance of the collective good and she behaves in a reciprocal way, but she differs in her opinion from her neighbour concerning the frequency of trimming the hedge. The mismatch in a Battle of the Sexes puts pressure on the trust between the people

6 Elster states that (besides quasi-moral norms) also social norms are conditional, in the sense that they are triggered by the presence or behaviour of other people. But defecting from social norms does not generate guilt.

involved. Accordingly, mistrust can start in one interaction that can be typified as a Battle of the Sexes game, but it can spread when the trust between the residents is undermined. Thus, an Assurance Game can develop into a Prisoner's Dilemma when the residents are no longer convinced of the Pareto-optimal option in an Assurance Game. In the following sections the developed theoretical framework will be applied to the empirical reality of modern residential neighbourhoods.

5.3 Methods

The approach taken in the present research is strongly associated with the rational choice method known as analytical narrative (Levi, 2003; Bates, *et al.*, 1998, 2000). 'Analytics' refers to the use of game-theoretical models. In analytical narratives, the narrative and the analytics are intertwined. The analysis of narratives establishes the actual players, their goals and their preferences (see Tables 5.1-5.3) while describing the logic of the interaction (Levi, 2003: 9).

The goal of this study is not to generalize per se from a sample to a population, but to find as much variation in interaction structures in order to arrive at trans-situational knowledge. This is called abduction (Awbrey & Awbrey, 1995). Among the residents of the various streets and housing blocks, respondents were selected at random by contacting every nth house, depending on the size of the building block or street. The sample reflects the diversity of residential settings in the neighbourhood's building types: single-family homes; dwellings in multiple-occupancy complexes; and social rented, private rented, and owner-occupied dwellings. Furthermore, it is indicative of the diversity of the neighbourhood population according to age, gender, education and ethnicity.

The interviews started with an eliciting question about unwritten rules, inviting people to describe social interaction situations in their neighbourhood.[7] Questions were asked about negative externalities, neighbourhood use, neighbourhood collective goods (shared stairway, entrance, collective garden, gallery, park, streets), informal social control, and about the likelihood that their neighbours would take action if they saw children misbehaving in public and whether the neighbours were willing to help each other. The interview material was interpreted on the basis of behavioural game theory, in terms of the Prisoner's Dilemma and the Assurance Game, with the software package Atlas-ti. The criteria to judge a neighbourhood's collective narrative as a perceived PD are as follows: (1) a respondent perceives a contrast between his

7 A semi-structured questionnaire was used for the in-depth interviews, based upon insights derived from a pilot (Adriaanse, 2004b).

personal, hedonistic and material goals on the one hand and the collective neighbourhood goals on the other; (2) a respondent finds that he has to invest high costs (time, money, effort) in the collective goals and that these efforts don't contribute to his own personal goals; (3) a respondent who contributes to (the maintenance of) a collective goal does perceive a great cost in relation to his personal interests and perceives only a small contribution of his efforts to the collective good. The criteria to judge a neighbourhood's collective narrative as a perceived AG are as follows: (1) a respondent does not perceive any discrepancy between his personal and the collective goals; (2) a respondent finds that he makes an essential contribution to the collective goal that is not in conflict with his own personal goals. For the statistical analysis, the Atlas-ti data were imported in SPSS 16.0.

5.4 Neighbourhood characteristics

All across Europe and the USA, a vast amount of mid-rise and high-rise estates were built shortly after the Second World War. In earlier work, Dutch post-Second World War mid-rise neighbourhoods were identified in the register data of Wegener and the ABF *Woningmarktmonitor 2003*. They are characterized by the following three conditions: (1) At least half of the housing stock in 2003 was built between 1945 and 1980; (2) the share of the dwellings in the total housing stock of the postal-code area is at least two standard deviations above the mean percentage of mid-rise flats in all Dutch neighbourhoods; and (3) the housing stock in the postal-code area is not predominantly (not 50% or more) of another type (the postal-code area comprises at least 100 households) (Adriaanse, 2007). Thus, in total, 116 neighbourhoods in the Netherlands belong to the category of 'post-war mid-rise' (Adriaanse, 2007).

Buitenveldert-Amsterdam belongs to this neighbourhood-type, according to these conditions. But at the same time it is atypical. One-third of the housing stock in Buitenveldert consists of owner-occupied dwellings and another third of private sector rental dwellings. The other third consists of social-rented housing. The large proportion of homes earmarked for owner-occupancy made Buitenveldert particularly attractive to the more prosperous segments of the Amsterdam population during the 1960s, when it was quite difficult to find suitable properties in other parts of the city. For quite a while, relatively little new construction was undertaken in the immediate vicinity of Buitenveldert. The mean length of residence is as much as 17 years and a quarter of the population have lived in the same house since the district's inception (Adriaanse, 2004). In 2004 over one-third (34%) of its population were aged 65 or above. The vast majority of residents (67%) are of 'native' Dutch origin. Only 8% can be classified as belonging to the 'non-Western ethnic minorities'. Both the educational level and the income of Buitenveldert residents are

markedly higher than in an average post-Second World War neighbourhood. Where the majority of these areas nowadays are confronted with increasing degeneration (see e.g. Heeger, 1993; Musterd & Van Kempen, 2005; Murie, Knorr-Siedow & Van Kempen, 2003; Power, 1997; Skifter Andersen, 2003; Turkington, Van Kempen & Wassenberg, 2004; Wassenberg, 1993), Buitenveldert has still a good reputation and lacks severe liveability problems. This makes Buitenveldert a 'most likely case' in terms of finding effective norms of cooperation in a suburban multi-family neighbourhood.

5.5 Sample characteristics

The respondent sample comprised 42 residents of Buitenveldert. It was composed of 16 males and 26 females (n = 42) whose mean age was 61.6 (SD = 17.9) with a range from 22 to 88 years. In terms of ethnic identity the majority of the sample was native Dutch (78.6%). Other residents had an Asian (4.8%), Jewish (11.9%), Antillean (2.4%), Surinamese or Eastern European (2.4%) cultural identity. In terms of the highest level of educational attainment, the sample characteristics were as follows: primary school 2.4%; junior domestic science 21.4%; junior general secondary education/ higher elementary 11.9%; upper secondary vocational 4.8%; pre-university 9.5%; higher professional 35.7%; and university 11.9% (n = 42). The mean length of residence in the neighbourhood was 16.8 years (SD = 12.6), ranging from 1 to 46 years (n = 42). All respondents gave information about neighbourhood collective goods: shared stairways, shared entrances, shared galleries, collective gardens, and neighbourhood streets and parks. In total 200 neighbourhood collective good narratives were collected.

5.6 Results

5.6.1 Prevalence of social dilemmas in Buitenveldert

This section presents the analysis of the Assurance Games and Prisoner's Dilemmas reported by residents during the interviews. In view of the theoretical framework and our first impressions of the social climate in Buitenveldert, we could expect only a limited number of people to report negative externalities and/or Prisoner's Dilemmas. In the theoretical section, a Prisoner's Dilemma (PD) was described as a situation whereby it is better for all when every individual cooperates, but it is the best for each individual not to cooperate. An Assurance Game (or Trust Game) (AG) was typified as a situation whereby it is the best for everyone when everyone cooperates, but each individual has to deal with the risk that the other will choose not to cooperate.

Another assumption that will be tested in this section is that residents who perceive Prisoner's Dilemma situations will also experience negative externalities. In other words, it is assumed that the perceived PDs are rooted in real negative experiences and are thus not imagined by the respondents. During the interviews, the respondents were asked to mention typical interactions with regard to the collective goods in their direct living environment. In the context of these neighbourhood collective good narratives, PDs and AGs were identified using specific criteria. In order to estimate the prevalence of Prisoner's Dilemmas and Assurance Games in the 200 collective good narratives, the mean of the reported PDs and AGs was calculated across all items of the collective good list. The six-item collective good list dealt with shared entrance, shared gallery, shared stairway, collective garden, and neighbourhood streets and parks.

The mean number of reported collective goods for each respondent was 4 (SD = 1.48), with a range from 2 to 6. The total percentage of PDs in 200 collective good narratives was 13% (n = 26). The total percentage of AGs in 200 collective good narratives was 87% (n = 169). Five collective good narratives (2.4%) could not be classified as a PD or an AG. The mean percentage of PDs for each respondent was 14.64% (SD = 25.8), with a range of 0 to 100 for Prisoner's Dilemmas. For Assurance Games, the mean percentage was 83.4% (SD = 27.8), with a range of 0 to 100. We can conclude that the respondents reported AGs far more often than PDs in their narratives.

The relation of % PDs and AGs to sex, age, educational level and length of residence

The following test results for PDs and AGs were found. The mean percentage of PDs and AGs was related neither to age (Pearson's correlations of 0.05 for PD and 0.02 for AG; both ns) nor to sex (t values of -0.23 for PD, p = 0.82 (ns); -0.37 for AG, p = 0.72 (ns)) nor to educational level (Anova F values of 0.05 for PD, p = 0.95 (ns); 0.14 for AG, p = 0.87 (ns)). The correlation between length of residence and the reported PDs was 0.16 (ns), and between length of residence and AGs the correlation was -0.07 (ns). In order to investigate the relation between length of residence and the percentage of reported PDs and AGs, the list of five dwelling types was dichotomized. An independent t test indicated that respondents living in terraced houses and flats did not differ significantly with regard to the mean percentage of PDs from the respondents living in detached, semi-detached, and corner houses (t = 0.52; p = 0.6).

Prevalence of altruistic punishment

The respondents reported altruistic punishment 51 times; thus, it occurred in 25.5% of all (200) narratives. Of the 42 respondents, 83.3% appeared to be altruistic punishers themselves; 9.5% were indifferent or not altruistic punishers; and data were missing on the remaining 7.1%. There was no statistically

Table 5.4 Number of negative externalities reported by respondents

Number of reported negative externalities	Frequency	Percentage
0	13	31
1	13	31
2	10	24
3	4	9
4	2	5
Total	**42**	**100**

significant relation with sex (χ^2 = 0.39, ns). And there was neither a statistically significant relation with age (t = -1.02, ns) nor with length of residence (t = -0.7, ns). Nor was there a significant relation with educational level, as calculated with a Mann-Whitney test (z = -1.6, ns).

Reported negative externalities

During the interviews, the respondents reported various negative externalities (see Table 5.4). The following nine types of nuisance were mentioned: (1) litter on the street; (2) walls and/or buildings defaced; (3) dog dirt on the street; (4) nuisance caused by young people; (5) stench, dust, refuse; (6) traffic nuisance; (7) nuisance caused by immediate neighbours; (8) nuisance caused by local residents; and (9) noise nuisance. In total the 42 respondents mentioned negative externalities 54 times (see Tasble 5.4). Of all reported negative externalities, 22% concerned noise and 20% litter; 16% were complaints about direct neighbours, 12% about local residents, and another 12% about young people; only 5% concerned stench, dust, and refuse; 3% were about dog dirt and another 3% about defaced walls.

The respondents were subsequently divided in two groups. The first consists of those who reported less than three different types of negative externalities (group 1) (n = 36); the second (group 2) consists of those who reported three or more (n = 6). On average, each respondent in group 1 reported 0.94 externalities; each one in group 2 reported on average 3.3 externalities.[8]

The next step was to cross-tabulate the tally of negative externalities with the types of games for each collective neighbourhood good. It appears that there is a statistically significant relation between the number of negative externalities, on one hand, and the frequency of Prisoner's Dilemmas perceived in the neighbourhood streets (Pearson χ^2 was 35.86, with p = 0.000) and on the collective stairs (Pearson χ^2 was 26.25, with p = 0.01) on the other hand. Accordingly, we can conclude that the number of reported negative externalities is statistically significantly related to the amount of reported Prisoner's Dilemmas in streets and shared stairways. The tendency is the same with respect to the other collective goods, but due to the small sample size these relations are not significant.

Subsequently, the difference in the total count of reported negative exter-

8 In the following analysis the difference in total count of reported negative externalities is compared with the proportion of PDs reported in narratives concerning collective neighbourhood goods. Six respondents reported an average of 36% of PDs in their reports of interactions considering collective neighbourhood goods. The majority, 36 respondents, reported 11% PDs in their reports of interactions regarding collective neighbourhood goods.

nalities is compared with the proportion of PDs reported in narratives about collective neighbourhood goods. According to the theory, we should expect that respondents who report more than the average number of negative externalities will also report significantly more Prisoner's Dilemmas in their narratives. The analysis confirms this expectation. Those respondents who reported three or more negative externalities reported on average statistically significantly more PDs: $t = -2.28$, $p = 0.03$. On average, those respondents reporting three or more negative externalities reported 34% more PDs than the other respondents.

Earlier in this article, the social climate of a residential environment was defined as an individual's expectation of how others will treat him or her, one another, and the spatial artefacts within the area that the individual experiences as his or her living environment (Adriaanse, 2005, 2007). The image that emerges from the statistical analyses is that Buitenveldert has a favourable social climate. The respondents reported AGs far more often than PDs in their narratives, except for those who live in small dwellings in flats or apartment buildings. In the following section, qualitative research results will be presented in further support of these findings.

5.6.2 The social climate of Buitenveldert

During the interviews, the respondents were asked if they agreed or disagreed with statements about trust, mistrust and distrust related to the situation in their own neighbourhood and their perception of their fellow residents. All 42 respondents recognized themselves in the statement that in Buitenveldert, generally you can assume that co-residents behave decently towards one another. Nobody recognized himself in either of the other two statements about distrust and mistrust. Consider the story of a widow (age 83), who is the owner of an apartment on the first floor and has lived in Buitenveldert for 11 years now.

> Interviewer: "So you generally expect co-residents to have good intentions?"
> Lady: "Yes."
> Interviewer: "Do you mean in general or especially in this neighbourhood?"
> Lady: "No I mean especially in this neighbourhood. Fifteen years ago when I lived in the Frans van Mieris-street [which is a street in another neighbourhood of Amsterdam (note by the author)] one evening I wanted to get some chips and then... it must have been dark... and then, suddenly I heard a voice behind me saying... 'I think you have some money for the streetcar for me...' Yes that was I think a drug addict or something... That will never happen to you here, really never."

A sense of mutual trust among a critical mass of residents has created a trustgenerating atmosphere that can also be 'sensed' by visitors pass-

ing through. For example, on one of my walks around Buitenveldert, I noticed cords hanging out of the mail slots on some of the doors. The 'mailbox cords' – used to pull the latch and open the door without a key – express something about the expected behaviour of co-residents. They are a manifestation of the mutual trust between residents in the past and are likely to foster a trust-generating atmosphere in the future. Also the residents themselves perceive collective efficacy that leads to a favourable social climate. The following impression comes from an Antillean man, 30 years old, who for two years has been living in Buitenveldert in a social rent flat on the 6th floor.

> "There seem to be some kind of unwritten rules around here. Because it is all so ehh, civilized, so neat, nobody has difficulties with anyone else (...). Buitenveldert is never in the news in a negative manner. And that's not because the police are so very busy here. Actually, I never see the police around here and cameras aren't here either, at least not that I know. Yes, I think it is mainly the residents themselves that together keep it liveable here."

Apparently it is not the degree of social interaction or social cohesion among the residents that would explain their residential satisfaction but the shared norms of civility and conduct which lead to the absence of negative externalities (Adriaanse, 2004b, 2008a). The following quotation comes from a lady, 51 years old:

> "I think the people here are rather antisocial in the sense that they really live for themselves. So, it's people who simply want to lead their own life and don't want to get involved with anyone else, that's true of many people here. But they are so that if they see someone having trouble then they do something about it and take action. For example when there is ice on the sidewalk and people run a risk of falling on it, then they clear it away, those are basic manners."

In this results section, the theoretical framework was applied to a case-study neighbourhood of a specific neighbourhood type. It was assumed that the intermingling of the physical and social characteristics of a residential environment can either facilitate and stimulate surveillance by the residents or restrict and frustrate it. In particular the structural – i.e. physical and social – neighbourhood characteristics specific to post-Second World War neighbourhoods can complicate actions of social control and altruistic punishment. Thus, these characteristics can lead people with a rational egoistic response tendency to perceive collective good games as Prisoner's Dilemmas.

Buitenveldert is a typical post-Second World War neighbourhood according to its physical layout. Nonetheless, it appears to have a social order that comprises a normative system rooted in generalized trust and shared norms of public conduct. Mutual trust and tolerance towards neighbours with another lifestyle or with another religious, cultural, or ethnic background appear to be

important preconditions for the development of a trust-generating atmosphere that does not discriminate against or exclude certain groups or individuals.

On a theoretical level, the objective of this study was to show that behavioural game theory is appropriate for the description and explanation of the behaviour of residents. By extension, this study sought to apply the deductive methodology, namely analytical narrative, to blend behavioural game theory and narration into the study of liveability problems. We can now state that the application of the theoretical framework and the quantitative and qualitative analysis of the collective neighbourhood good narratives of the respondents has led to satisfying results.

5.7 Conclusion and discussion

Conclusion

The theoretical framework developed in this article explains the proximate causes behind liveability problems in neighbourhoods, relying on behavioural game theory and especially the strong reciprocity thesis. The method was expected to enable a precise analysis of the narratives of residents concerning social interactions and the perception of negative externalities related to the public goods in their living environment. The main elements of the theoretical framework are the concepts of norms, trust, and dominant response tendencies, based respectively on Elster's distinction between moral norms, quasi-moral norms, and social norms.

Subsequently the theoretical framework, including the Prisoner's Dilemma, the Assurance Game and the Battle of the Sexes, was applied to the 200 narratives collected from a small sample of residents, and with encouraging results. We can conclude that the respondents of the viable post-Second World War neighbourhood Buitenveldert-Amsterdam reported AGs far more often than PDs. The mean percentage of PDs and AGs was not related to the respondents' age, sex or educational level. In Bengtsson (2000) it is concluded that norms of cooperation may be institutionalized among residents in most types of housing estates, regardless of socio-economic status, social homogeneity or stability (Bengtsson, 2000: 183-184). This seems to be well in line with the conclusions of this paper.

Multivariate analysis further demonstrated that the number of reported negative externalities is statistically significantly related to the amount of reported Prisoner's Dilemmas in streets and shared stairways. The same tendency was found for the other collective goods. The theoretical assumption that respondents who report more than the average number of negative externalities will also report significantly more Prisoner's Dilemmas was confirmed by the empirical analysis. The qualitative research results further confirmed the finding that Buitenveldert has a favourable social climate even

though it bears the physical layout of a 'vulnerable' neighbourhood type.

What new insights can be derived from this study? First, it may be concluded that the social climate of a residential neighbourhood is of decisive importance for the residential satisfaction of residents. In a neighbourhood context, the varying interpersonal preferences of residents – instrumental rationalism versus different types of norm-oriented preferences – determine to a large extent the degree of cooperative behaviour and the effectiveness of social control mechanisms. Second, we can conclude that the key to a better understanding of neighbourhood events lies not in the demographic characteristics of the population but in the behaviour of individuals in the residential environment. As long as certain cultural or religious practices of subgroups do not interfere with quasi-moral norms of trustworthy conduct in the whole community, there will presumably be no problem when people of diverse ethnic or religious backgrounds reside in the same area.

A third important insight was that mistrust can start in an interaction that can be typified as a Battle of the Sexes game and can spread when trust among residents is undermined. So what is important here – especially for policy-makers – is to make the residents choose the Pareto-optimal option in an Assurance Game and prevent trust relationships from coming under the pressure of a Battle of the Sexes game. At the same time, tolerance of people with other social norms appears to be not unconditional. Rather, tolerance seems to be defined by the implicit demand to act as a trustworthy neighbour and not to cause any negative externalities for co-residents.

Finally, altruistic punishment appears to be an effective working strategy to make rule-offenders adapt to quasi-moral and social norms regarding neighbourhood upkeep, civility and mutual respect. Follow-up research based on the theoretical framework and the method developed in this article can give further proof of its applicability.

Discussion

Social problems in neighbourhoods often have to do with the conflicting social norms of different groups. Such conflicts occur between elderly and younger residents or between residents with different ethnic, religious and socio-cultural backgrounds. Presumably these problems can be identified as Battles of the Sexes, which cause in and out-group perceptions and distrust. Follow-up research with an instrument prepared according to the principles of behavioural game theory could yield clearer reference points about how social tensions lead to discrimination and the exclusion of individuals or minority groups. Policy-makers and practitioners can intervene by introducing quasi-moral norms in problematic communities to generate respect and trust between people with different social norms. Additionally a clear communication among professionals and residents about the definitions of the collective neighbourhood goods is of vital importance in the effort to prevent liveability

problems and to encourage collective efficacy among residents.

It was assumed that the intermingling of physical and social characteristics in a residential environment can either facilitate and stimulate or restrict and frustrate resident surveillance. Follow-up research could shed some light on this point. Especially pertinent to the field of urban studies is the role of well-maintained and attractive public amenities and public and semi-public spaces as the physical conditions for norm transfer and altruistic punishment. Another point of both theoretical and practical relevance is the connection between the applications of behavioural game theory in the field of urban studies – for which a first, albeit modest step has been made in this article – and the recent empirical results of experiments with the Broken Window thesis (Wilson & Kelling, 2007; Keizer, Lindenberg & Steg, 2008).

The idea that the socio-economic environment shapes the costs and benefits of cooperation and altruistic punishment and is thus likely to be an important determinant of social norms seems to be widely accepted. But empirically as well as theoretically, we still know little about the underlying processes. More knowledge in this area is necessary to gain a better understanding about which environment is likely to favour which norms and thus to be able to predict when norms are stable and when they will change.

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6 Mutual trust and verbal sanctioning as proximate causes of a viable residential social climate

C.C.M. Adriaanse. Submitted.

Abstract
The production and maintenance of collective neighbourhood goods is a determining factor with respect to the environmental satisfaction that residents experience. This paper focuses on mechanisms that produce and maintain a favourable social climate within a residential environment by facilitating residential cooperation without requiring strong ties or associations. The paper develops a game-theoretical framework for analysing the role of cheap talk, trust and verbal sanctioning in the production and maintenance of collective neighbourhood goods. The framework is empirically applied to 200 narratives by 42 residents about neighbourly relationships in a multi-family neighbourhood in Amsterdam. The central theoretical concepts are 'social dilemmas', 'altruistic punishment', 'verbal sanctioning' and 'trust'. The results indicate that mutual trust and verbal sanctioning are important determinants of 'what types of games residents intend to play', which in turn determine cooperative behaviour and the effectiveness of social control in a neighbourhood.

Keywords
Behavioural game theory, post-Second World War neighbourhood, social dilemmas, unwritten rules, mutual trust, altruistic punishment, verbal sanctioning

6.1 Introduction

Disorder and incivility, as much as crime, communicate the failure of a community to self-regulate. This paper starts from the premise that in a problem-free residential environment, residents share standards that underlie collective efforts to establish social order and a viable social climate (Elster, 1989; Adriaanse, 2008). These efforts are initiated or pursued informally through 'unwritten rules' directed at collective goods, which express the self-regulating capacity of a neighbourhood, understood as an action arena (Ostrom, 2005). The defining characteristic of a public good such as a safe and clean amenity – be it a neighbourhood, block of flats, collective garden or shared stairway – is that no group member can be excluded from its consumption. However, each individual also has an economic incentive to free-ride; that is, to contribute nothing towards providing the good (Olson, 1971; Hardin, 1971). This means that if residents behave according to the economic incentive, they will not cooperate, and therefore the public good will not be provided (Fehr & Fischbacher, 2004: 186). This zero-contribution thesis underpins the presump-

tion in policy textbooks (and many contemporary public policies) that individuals cannot overcome obstacles to collective action; thus, they need externally enforced rules to achieve their own long-term self-interest (Ostrom, 2000: 137). However, the bulk of people's daily interactions are not governed by explicit, enforceable contracts but by implicit agreements and norms (Ostrom, 1990; Hechter & Opp, 2001; Voss, 2001; Camerer & Fehr, 2006).

The aim of this paper is to interpret the informal mechanisms of social control that underlie collective efforts to produce and maintain collective residential goods. The question addressed here is: What are the properties of the ensuing social interaction that make residents living in an early post-Second World War neighbourhood – which is considered a vulnerable neighbourhood type – choose to act in support of collective residential goods?

The analytical framework applied here is derived from behavioural game theory (Henrich *et al.,* 2004). Behavioural game theory uses concepts and models of overt human behaviour, interaction and underlying social-dilemma situations and social control, all of which have convincing empirical bases in hundreds of studies worldwide (Camerer, 2003; Henrich *et al.,* 2004). This makes the theory useful for the analysis of interactions between co-residents when they are making interdependent choices and acting repeatedly as producers and maintainers of collective and public goods in their daily living environment. The application of the theory to interactions between residents is rather new. While Bengtsson (1998, 2000) used a game-theoretical framework to study tenant involvement in Swedish housing estates, his empirical analysis was carried out at the estate level, unlike the present study, where the empirical analysis is carried out at the individual level. The case-study area for this article, Buitenveldert-Amsterdam, is a viable neighbourhood with a favourable social climate, despite the fact that it has the physical-spatial characteristics of a typical post-Second World War neighbourhood. This makes Buitenveldert a 'critical case', having strategic importance in relation to the general problem at the core of this article (Flyvbjerg, 2006).

The next section expands on the theoretical framework, and the following one briefly sketches the case-study district. The methods and sample characteristics are described in the fourth section. The fifth section presents the empirical results. The article ends with some concluding remarks and a few comments for further discussion.

6.2 Theoretical framework

6.2.1 Spatial characteristics and liveability problems

Shortly after the Second World War, mid-rise neighbourhoods were built across Europe according to the principles of the CIAM *(Congrès Internationaux*

d'Architecture Moderne) movement of modern architects. The areas are characterised by half-open building blocks, open spaces between the blocks, separated transport routes, and a mix of high-rise and mid-rise blocks of flats and single-family dwellings. Some of the dwellings were designated for the owner-occupied sector but most were in the social rental sector (Murie *et al.,* 2003). These post-war housing areas are served by a distributed road network running between neighbourhoods. The local streets within the areas have a non-distributed structure that discourages through traffic. The streets are not only too wide for people to see into neighbouring houses but often do not run parallel. Accordingly, the public spaces have low inter-visibility and a low degree of social control, since few windows and doors face the streets (Van Nes & Rueb, 2009). Most of these neighbourhoods have become problematic; this type of neighbourhood is now associated with sub-standard living conditions, deprivation, marginal locations, poverty, a negative image, social isolation, pollution and crime (see e.g. Heeger, 1993; Wassenberg, 1993; Power, 1997; Murie *et al.,* 2003; Skifter Andersen, 2003; Turkington *et al.,* 2004; Musterd & Van Kempen, 2005).

6.2.2 Perceived discrepancy between short-term self-interest and collective goals

People who occupy mid-rise and high-rise buildings live close together in large numbers within a relatively small area and with several shared spaces. Thus, they regularly have coincidental encounters with more or less unfamiliar co-residents, many of whom have different preferences and backgrounds. They are forced to interact simply because they cannot avoid one another. In this setting, satisfaction with the residential environment is partly determined by the production and maintenance of collective neighbourhood goods.

Uncertainty about the actions of (unknown) others can easily evoke a sense of insecurity in this type of residential area. Unable to predict the future conduct of individuals who differ from us, we react to such uncertainty with suspicion. Sztompka (1999: 26) uses the term 'mistrust' to convey the lack of clear expectations as well as 'hesitation about committing oneself'. For neighbourhoods, neither experienced mistrust nor experienced distrust is a favourable situation. Both pose a serious threat to the quality of life there because they may degenerate into social dilemmas and liveability problems. In this paper, social dilemmas are deemed to arise when there is a discrepancy between short-term self-interest and collective goals. Social dilemmas occur whenever individuals in interdependent situations face choices in which the maximum of short-term self-interest yields outcomes leaving all participants worse off than feasible alternatives (Ostrom, 1998: 1). By presenting social dilemmas in the form of games, the researcher can make rational reconstruc-

tions of events in a social system. In this article, the Prisoner's Dilemma (PD) and the Assurance Game (AG) are applied to interactions in residential neighbourhoods. But here, PD and AG are defined in terms of intentions rather than outcomes, as usually done in game theory. The reason to deviate is that this researcher has not conducted an experiment but has asked residents for their opinions.

Prisoner's Dilemma

In the case of a significant perceived discrepancy between short-term self-interest and a collective goal, the interaction could be qualified as a Prisoner's Dilemma (see Table 5.1, Chapter 5). A standard Prisoner's Dilemma situation may be attributed to the cleaning of a shared stairway. Let us define a member A of a group of co-residents G of an apartment block with the collective good of a clean shared stairway. Co-resident A intends to act selfishly (plays a Prisoner's Dilemma) with respect to the clean stairway, which is produced by a joint action X, if and only if: (1) co-resident A intends to act selfishly, not to contribute or do his part of X; (2) co-resident A has the cognition that successful action for the production of X requires at least K co-residents to join in; (3) co-resident A believes that he ought to participate in the production of X and that each adequately informed member of G ought to contribute; (4) co-resident A believes that he will gain more in the short term by selfish behaviour than from contributing if K co-residents contribute; (5) co-resident A believes that the outcome resulting from all residents acting normatively in the long term is better than the outcome when all act selfishly; (6) co-resident A believes that his selfish behaviour involves a cost (possibly nil) to the contributing co-residents of G; (7) co-resident A is not willing to sanction the co-residents of G-K who do not act normatively; and (8) co-resident A is not willing to inform the co-residents of G-K who do not know the norm.

6.2.3 Trust and the role of communication and cheap talk

Trust and the Assurance Game

As a first approximation, trust may be defined as the expectation that another player will not defect in a sequential Prisoner's Dilemma. Sztompka (1999) defines trust as 'a bet about the future contingent actions of others'. It presupposes a situation of risk, but can also be a matter of routine and normal behaviour (Luhmann, 2000). In terms of behavioural game theory, trust is defined as positive strong reciprocity (Gintis *et al.,* 2005). It encourages cooperative behaviour by creating a social obligation: 'trust in someone engenders reciprocal trust' (Sztompka, 1999). Uslaner found that generalised trust matters because it helps connect us to people who are different from ourselves. Generalised trustees were found to be tolerant of immigrants and minorities and support equal rights for women and gays (Uslaner, 2002).

A typical example of a well-defined game where there is no perceived discrepancy between short-term self-interest and a collective goal, and all residents are willing to provide an essential contribution, is called an Assurance Game (see Table 5.2, Chapter 5).

In line with the six criteria which define a PD, I will now define the criteria of an AG as follows: Co-resident A intends to act normatively (plays an Assurance Game) with respect to the collective good, which is produced by a joint action X, if and only if: (1) co-resident A intends to act normatively, to contribute or do his part of X; (2) co-resident A has the cognition that successful joint action for the production of X requires at least K co-residents; (3) co-resident A believes that he ought to participate in the production of X and that each adequately informed member of G ought to contribute; (4) co-resident A believes that he will gain more by normative behaviour than from acting selfishly if K co-residents contribute; (5) co-resident A believes that the outcome resulting from all residents acting normatively in the long term is better than the outcome when all act selfishly; (6) co-resident A believes that his normative behaviour is essential to the contributions of the co-residents of G; (7) co-resident A is willing to sanction the co-residents of G-K who do not act normatively; and (8) co-resident A is willing to inform the co-residents of G-K who do not know the norm.

In an Assurance Game situation, community residents share norms that underlie any collective effort on their part to establish viability, social order and safety. If some residents conclude that those around them will help clean the street, they respond by contributing in kind, prompting still others to contribute and so forth and so on until a highly cooperative state of affairs takes root (Marwell *et al.*, 1988).

An Assurance Game can change into a Prisoner's Dilemma situation when the expectations of residents about each other's future contribution decline. Therefore it is important that the co-residents of G communicate their intentions to establish who intends to act selfishly or normatively. In a sequential context such as a residential environment, a stable intention and will to contribute reveal a resident's character or disposition. In behavioural game theory this revealed aspect is called 'type' (Spence, 1974).

The role of communication and cheap talk

Game theorists and economists have found many instances of 'signalling', as discussed by Spence (1974). Applied to a sequential context such as a residential environment, informed residents will take possibly costly actions towards co-residents G that will reveal resident A's 'type' (Farrell & Rabin, 1996); in other words, reveal if someone intends to act selfishly or normatively. The game-theoretical concept of 'cheap talk' is strongly connected to criterion 8 from the definitions of the PD and AG, namely 'co-resident A is willing to inform the co-residents of G-K who do not know the norm'. The willingness to

inform co-residents of G-K who do not know the norm is costless. In game theory this kind of costless communication is called 'cheap talk'. Experimental studies of social dilemmas have shown that costless communication leads to more efficient outcomes (Ostrom *et al.,* 1992) by overcoming problems of strategic uncertainty and coordination failure.

6.2.4 Essential contribution, altruistic punishment and verbal sanctioning

Recent empirical findings from behavioural experiments show that altruistic punishment effectively enforces cooperation among unrelated and anonymous humans (Yamagishi, 1986; Fehr & Gächter, 2002; Fehr & Fischbacher, 2003; Falk, Fehr & Fischbacher, 2005). Altruistic punishment is costly, in contrast to cheap talk. However, what exactly is altruistic punishment? Altruistic punishment or negative strong reciprocity means that individuals punish others, despite the punishment being costly to them and yielding no material gain. Fehr & Gächter (2002) show that cooperation flourishes if altruistic punishment is possible and that it breaks down if altruistic punishment is ruled out. A strongly reciprocating individual punishes a person who does not adhere to the norm, even if so doing costs this individual more than he or she may gain from it, acting thereby not from an egoistically defined instrumental form of rationality but from a perceived sense of values. Norms of cooperation and fairness may evolve only when enough people are committed to punishing norm violations (Henrich *et al.,* 2004; Fowler, 2005).

The co-residents of G always have the option to break a rule and act selfishly. If the risk of being monitored and sanctioned by residents K is low, the predictability and stability of joint action X are reduced and instability can grow over time. However, if the risk of exposure and sanctioning is high, residents G-K can expect that others will punish. Hence, a critical mass of punishers is needed to guarantee the effective sanctioning of free-riding by G-K in the residential social climate action arena.

Altruistic punishment itself represents a second-order public good (Boyd *et al.,* 2003; Yamagishi, 1986); that is, the benefits of punishment can be enjoyed by all members of group G regardless of their individual contributions. Because the act of punishing norm violators is costly (i.e. one must expend time and energy to punish, and one risks retaliation), it is in an individual's best interest not to punish, thereby avoiding the costs. Nevertheless, people often do punish norm violators, despite the costs and even when the actions of norm violators do not directly affect them (Fehr & Fischbacher, 2004; Fehr & Gächter, 2002; Henrich *et al.,* 2004).

Verbal sanctioning

In the game-theoretical literature, the assumption of altruistic punishment is usually limited to individuals using monetary or material punishment. In neighbourhoods, altruistic punishment also takes place between residents, but in a specific form. Slapping a neighbour in the face when he puts his garbage in the hallway is not usual practice (and most likely not the most effective strategy to achieve one's goal). An often practiced form of altruistic punishment for resolving assurance games in neighbourhoods is an immaterial form of sanctioning, namely verbal sanctioning. This means that residents use verbal communication to criticise each other for not conforming to their norms. Like altruistic punishment, verbal sanctioning can also be costly, including exiting from mutually beneficial relationships, gossip, quarrels, ostracism and threats of violence. However, acts of verbal sanctioning can deter future deviations, thus providing a public good of informal social control.

6.2.5 Hypotheses

We reason that (A) Buitenveldert is a typical example of the post-Second World War neighbourhood type (see Section 6.2.1). (B) As such it should manifest liveability problems. (C) Buitenveldert has no manifest liveability problems (Adriaanse, 2004) because the interactions between its residents have a specific structure. (D) The defining characteristics of this interactive structure are: (1) there is little or no perceived discrepancy between residents' short-term self-interests and collective goals; (2) residents have the conviction that most of their co-residents make an essential contribution to the collective goals; (3) residents are willing to use verbal sanctioning to enforce cooperation among each other. From this, we derive the following hypotheses:

1. Buitenveldert residents trust their co-residents.
2. Residents of Buitenveldert will report verbal sanctioning.
3. Residents play Prisoner's Dilemmas statistically significantly less often than Assurance Games.

6.3 Characteristics of the case-study area

In Buitenveldert-Amsterdam the housing stock consists of 33% owner-occupied dwellings and 33% private rental dwellings. Another 33% consists of social rental dwellings. The large proportion of homes earmarked for owner-occupancy made Buitenveldert particularly attractive to the more prosperous segments of the Amsterdam population during the 1960s, when it was quite difficult to find suitable properties in other parts of the city. For a long period, relatively little new construction was undertaken in the immediate vicinity of Buitenveldert. As a consequence, 25% of the population has lived in the same

dwelling since the district's inception (Adriaanse, 2004). In 2004 over one-third (34%) of its population was aged 65 or above. The vast majority of residents (67%) are of 'native' Dutch origin. Only 8% can be classified as belonging to 'non-Western ethnic minorities'. Both the educational level and the income of Buitenveldert residents are markedly higher than in an average post-Second World War neighbourhood.

Because Buitenveldert has the typical spatial-physical characteristics of an early post-Second World War neighbourhood, we would expect similar problems here, but we did not find them. According to an objective safety index, Buitenveldert is the safest district in Amsterdam (Gemeente Amsterdam, 2010). Even now – more than forty years since it was established – Buitenveldert still ranks among the most attractive of Amsterdam's residential areas, with a good position on the regional housing market (Adriaanse, 2004).

6.4 Methods

6.4.1 Procedure

Respondents were selected at random by contacting every n'th house, depending on the size of the building block or street. The sample reflects the range of residential settings in the neighbourhood's building types: single-family homes, dwellings in multiple-occupancy complexes, and social rental, private rental and owner-occupied dwellings. Furthermore, this range is indicative of the diversity of the neighbourhood population in terms of age, gender, education and ethnicity.

It was not possible to ask respondents bluntly, 'What game do you think you and the other residents are playing?' Thus, to find out how residents form mental models or perceptions of elements of Assurance Games and the Prisoner's Dilemma – who the players are, what the strategies are, what the payoffs are and so forth – we asked a question that elicited the unwritten rules. This procedure is based on the cognitive theoretical approach to game theory described in Sections 6.2.2 and 6.2.3. In a semi-structured design the interviewer inquired about unwritten rules with respect to six collective goods commonly mentioned by residents: (1) shared stairways and gallery, (2) shared entrance to the building, (3) collective garden, (4) neighbourhood park, (5) neighbourhood streets and (6) shared storage rooms.

The interview material was interpreted using the software package Atlas-ti. The analysis of the respondents' narratives established the actual players, their goals and their preferences while describing the logic of the interaction (Levi, 2004: 9). The criteria for judging a neighbourhood collective narrative as a perceived Assurance Game are as follows: (1) A respondent does not perceive any discrepancy between his/her personal goals and the collec-

tive goals; (2) A respondent expects that he/she has to make an essential contribution to the collective goal that is not in conflict with his/her own personal goals.

A typical example of an Assurance Game making clear the equivalence of the concepts 'common goals' and 'unwritten rules' comes from a 51-year-old woman. The common goals mentioned are 'a safe and clean street' and 'norms of civility and conduct'. The essential contribution is expressed as 'a basic manner':

> "I think the people here are rather antisocial in the sense that they really live for themselves. So, it's people who simply want to lead their own life and don't want to get involved with anyone else; that's true of many people here. But if they see someone having trouble then they will do something about it and take action. For example when there is ice on the footpath and people run the risk of falling over, then they clear it away, those are basic manners."

During the interviews the respondents were also asked if – generally speaking – they trust, distrust or mistrust their co-residents. Sztompka's concepts of trust, mistrust and distrust were operationalised in the following three propositions:

- 'I assume that in general residents of Buitenveldert treat each other pleasantly.'
- 'In general you don't know whether residents of Buitenveldert have good or bad intentions.'
- 'Concerning the attitude of co-residents you must assume generally that people have no good intentions.'

The criteria to judge a neighbourhood collective narrative as a perceived Prisoner's Dilemma are as follows: (1) A respondent perceives a contrast between his/her personal, hedonistic and material goals on the one hand and the collective neighbourhood goals on the other; (2) A respondent expects that he/she must invest high costs (time, money and effort) to achieve the collective goals and that these efforts do not contribute to his/her own personal goals; (3) A respondent who intends to contribute to (the maintenance of) a collective goal does perceive a great cost in relation to his/her personal interests and perceives only a small contribution of his efforts to the collective good.

A typical example of a Prisoner's Dilemma concerned the collective good of a clean and neat gallery and proper use of the lift. Here the respondent reports negative externalities and that the norm offender violates the unwritten rule of 'not taking a bike or a shopping trolley into the lift and leaving it in the gallery':

> "You see them enter the lift with bikes and shopping trolleys from Albert Heijn [Auth:

name of shop], and yes you cause damage by doing so!... Yes that is how it happens. They come all the way from the shopping centre with such a trolley. [With angry voice:] And then they leave it in the gallery and only when they have to go to the shopping centre again, they take it back there."

With respect to the foregoing, verbal sanctioning was defined as dealing with the violation of unwritten rules despite the costs and even when the actions of rule violators do not directly affect them. A typical example of verbal sanctioning is the following quotation about the collective good of a shared storage room:

"Usually, when you are annoyed at something then you usually say that and when someone else gets annoyed at you then he will say so too. But, yes this rarely happens, and yes, it is even so that my neighbours use a part of my storage room because theirs is very small and I have a big one. And... but yes, the other day they had made a mess of it and yes then I have, my son then got immensely angry and told them 'listen this is out of the question, now everything has to be taken out...', and within half an hour everything was removed and cleaned up and yes that is just okay, it just had to be said and then there is no problem for the rest."

6.4.2 Sample

The respondent sample was composed of 42 residents of Buitenveldert. It comprised 16 males and 26 females (n = 42) with the mean age of 61.6 (SD = 17.9) and ranging from 22 to 88 years of age. In terms of ethnic identity, the majority of the sample was native Dutch (78.6%). Other residents had an Asian (4.8%), Jewish (11.9%), Antillean (2.4%), Surinamese or Eastern European (2.4%) cultural identity. In terms of highest educational level, the sample characteristics were as follows: primary school, 2.4%; junior domestic science, 21.4%; junior general secondary education/higher education, 11.9%; upper secondary vocational, 4.8%; pre-university, 9.5%; higher professional, 35.7%; and university, 11.9% (n = 42). The mean length of stay in the neighbourhood was 16.8 years (SD = 12.6), with a range of 1 to 46 years (n = 42). Every respondent was asked about the six neighbourhood collective goods, which resulted in 200 narratives. The mean number of reported collective goods for each respondent was 4 (SD = 1.48), with a range of 2 to 6.

6.5 Results

Even though most of the residents are of Dutch origin – including a large Jewish community – the present-day population of Buitenveldert consists of distinct groups living parallel lives. Moreover, Japanese, Korean, English and

American expatriates tend to live in the Netherlands only temporarily (rarely longer than ten years). Like the members of the Jewish community, the expats operate primarily within their own group. Few expats speak Dutch. Like the Jewish residents, they have their own shops, schools, restaurants, cafes and facilities; for instance, there is a Japanese drycleaner and an Asian video rental. There are also synagogues, Jewish schools, Jewish-oriented stores and a Jewish home for the elderly in the area (Adriaanse, 2004). Unwritten rules in Buitenveldert are directed to the domain of semi-public action arenas. Respondents mentioned shared entrances, galleries and stairways, the collective garden, and the neighbourhood streets and parks. The main purpose of the unwritten rules appears to be maintenance of the shared norms of privacy, minimal social group interaction, the maintenance of middle-class norms of decency and good neighbouring and, more specifically, proper garbage handling and the prevention of noise pollution.

6.5.1 Prevalence of social dilemmas in Buitenveldert

At the end of the theoretical section it was hypothesised that (1) the Assurance Game will be the basic element of the social system of Buitenveldert (covered by Hypotheses 1 and 2), and (2) residents of Buitenveldert play Prisoner's Dilemmas statistically significantly less often than Assurance Games (Hypothesis 3). An Assurance Game was characterised as a situation whereby it is best for everyone when all cooperate, but each individual has to deal with the risk that others will choose not to cooperate. A Prisoner's Dilemma was described as a situation whereby it is better for all when every individual cooperates, but it is best for each individual not to cooperate.

In order to estimate the prevalence of Assurance Games and Prisoner's Dilemmas in the 200 collective-good narratives, the mean of each of the reported games was calculated across all items of the collective-good list. The proportion of Assurance Games in the 200 narratives was 87% (N = 169), while the share of Prisoner's Dilemmas was 13% (N = 26). Five narratives (2.4%) could not be classified as either a Prisoner's Dilemma or an Assurance Game. The mean percentage of Assurance Games for each respondent was 83.4% (SD = 27.8), with a range of 0 to 100. The mean percentage of Prisoner's Dilemmas for each respondent was 14.64% (SD = 25.8), with a range of 0 to 100. We can conclude that the respondents reported Assurance Games far more often than Prisoner's Dilemmas in their narratives. So, do residents of Buitenveldert trust their co-residents? In Buitenveldert, despite the fact that people may not know most of their neighbours well or even by name, there appears to be common knowledge about who lives in the neighbourhood and who does not. All of the respondents recognised the co-residents of their own street or apartment building by face; all agreed with the first proposition on trust; and all disagreed with the two propositions on distrust and mistrust (see Section 6.4.1 Procedure).

6.5.2 Prevalence of verbal sanctioning in Buitenveldert

The respondents reported verbal sanctioning 51 times; thus, it occurred in 25.5% of the (200) narratives. Of the 42 respondents, 83.3% appeared to be altruistic punishers themselves; 9.5% were indifferent or not altruistic punishers; and data were missing for the remaining 7.1%. There was no statistically significant relationship between verbal sanctions and gender (chi-square 0.39, ns), age (t = -1.02, ns), length of residence (t = -0.7, ns) or dwelling and property type. Nor was there a significant relationship with educational level, as calculated by a Mann-Whitney test (z = -1.6, ns).

6.5.3 Verbal sanctioning in action

The following narrative comes from an Antillean man (aged 26) who had been living in a social rental flat in Buitenveldert for one year. He explains how verbal sanctioning happens in everyday interactions between co-residents:

> "... No, here there are no explicit rules that are mutually arranged, but when you don't obey them, you'll hear about it... One day, ehm, I had left my bike in front of the door and then I was told, yes, that it is not the intention that you leave your bike in the gallery."

The following example comes from a woman (aged 56) who lives in a social rental dwelling in an apartment building. She who acted as an altruistic punisher towards a co-resident who left his motorcycle in the shared passage, even though she was aware that doing so might jeopardize the relationship:

> Author: "But are there other people besides you that keep an eye out?"
> Respondent: "Oh yes a lot."
> Author: "So you are not the only one?"
> Respondent: "No, oh no, there are others too that said, 'Who is the owner of that thing?'"
> Author: "And how did you notice that?"
> Respondent: "Yes, when they were walking along or when you run into someone in the shared storage room and then they say 'Whose motorcycle is it actually? Can the thing be removed?' Yes that is how things happen here. Yes and because of that we did put a note on it with the message, 'Who is the owner and can the motorcycle be removed, because of the risk of fire.' And after a while it was actually removed."
> Author: "And was it never there again?'"
> Respondent: "No, but yes there is another one standing in the way, but it has no fuel in it. So we let it stay. It is standing a little bit more in the alcove; the other one was completely in the passage. And you must not always be difficult because otherwise they think, 'There is that old bore again."'

Through the pressure exerted by co-residents conforming to an unwritten

rule, norm violators cease their deviant behaviour and thereby avoid future verbal sanctioning. They adapt to the dominant norm in order to maintain their reputation as a decent neighbour and to demonstrate their trustworthiness to their co-residents. The following example comes from a resident who had received verbal sanctioning from a co-resident. A native Dutch student, aged 22, who had been living in the area with a fellow student for one year in a social rental flat, explains:

> "You feel you have to adapt yourself. You can't do strange things here. They won't be glad if you act strangely, and it will immediately attract attention. Some students are over the top and have a party every evening. And because a lot of elderly and working people live here, you have to stay a little calmer... Once they came to our place... and, yes, they understand it, they said they were also young once... But, yes, now we start around seven and we stop the music at midnight... So, yes, we really try to keep it in mind."

6.5.4 Interpretation of the results

In this results section, the theoretical framework was applied to a case-study neighbourhood of a specific type. It was assumed that the characteristics specific to post-Second World War neighbourhoods can complicate acts of social control and verbal sanctioning. According to its physical layout, Buitenveldert is a typical post-Second World War neighbourhood. It is also composed of more than two racial and ethnic groups, between which social interaction is relatively rare. As is often the case in neighbourhoods consisting of groups that belong to different communities, negotiating the details of daily life can be problematic. However, in Buitenveldert, the various racial, ethnic and religious groups manage to live 'separately' but alongside one another without encroaching upon or conflicting with the other groups. The neighbourhood appears to have a social order that comprises a normative system rooted in generalised trust and shared norms of public conduct. The mutual trust built up through communication, including verbal sanctioning, appears to be an essential aspect of resolving collective action problems.

An important condition that was necessary for the development of a 'community of trust' in Buitenveldert seems to be the stability of the neighbourhood's population. No rapid transition has occurred that could undermine the social order and patterns of cooperation. The fact that 25% of the population has lived in the same dwelling since the district's inception, in combination with a selective transience process (the replacement of one individual with another of similar identity), has meant that the existing normative order has not been challenged.

6.6 Conclusion and discussion

The article demonstrates how behavioural game theory, and especially theoretical notions about social dilemmas, offer useful tools for the analysis of residential interaction situations related to the production and maintenance of collective and public neighbourhood goods. Despite the fact that behavioural game theory is not able to predict exactly how future interactions will take place, the post hoc analysis of interdependent choices and the patterns – presented as games – make us aware of the subtleties of human interactions in a social system (Elster, 2007).

The findings of this paper are significant in establishing that voluntary cooperation and verbal sanctioning presuppose the existence of an intermediate system of unwritten rules or norms of good conduct. This intermediate system can exist independently of national legal systems. The policies of national governments, local authorities, housing associations, the police and the public prosecution service (see for example the Dutch 'Social and Physical Disorder Action Plan', SCP 2009) are designed to tackle liveability problems such as antisocial behaviour by young people and social and physical disorder in the residential setting. The conventional approach defines liveability problems from the perspective of a variety of legal systems. This has resulted in more police control and camera surveillance, and greater intolerance of residents who have different ethnic and cultural backgrounds. However, when such explicit material incentives (fines, eviction) are applied to the task, there is a risk that voluntary cooperation and altruistic punishment will cease to occur because the preconditions for the operation of strong reciprocity are removed (see Gintis *et al.,* 2005: 20). Policymakers – who may want to apply behavioural game theory as an analytical tool with a rich and sharp language – should use the concept of 'unwritten rules' as an intermediate structure between law on the one hand and face-to-face interactions on the other. Scholars who focus on material incentives must recognise that subtle verbal communication efforts are sometimes very effective for turning what could be a Prisoner's Dilemma into an Assurance Game over time.

The Buitenveldert case also shows that social mixing in high-density residential areas can work when members of the different groups share certain core social norms and exhibit tolerance towards each other's beliefs and lifestyles. At the same time, tolerance is not unconditional but delineated by an implicit demand to act as a trustworthy neighbour and not to cause any inconvenience to co-residents. The Buitenveldert population use subtle communication skills for effectively tackling norm offenders. Whether these conditions apply in less prosperous multi-ethnic neighbourhoods with a larger proportion of less well-educated residents remains an open question.

The study of altruistic cooperation is clearly a cross-disciplinary endeavour, integrating behavioural ecology, evolutionary biology, experimental eco-

nomics, sociology and psychology. This article combines insights from behavioural game theory and sociology to study cooperation and verbal sanctioning in a residential environment. Ultimately, a deeper understanding of the nature of cooperation and altruistic punishment will require further interaction between these and other fields.

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7 Conclusion and discussion

This final chapter draws together the strands of the preceding chapters to answer the research questions posed in the Introduction. On that basis, I then critically reflect on the research results and offer suggestions for policy and further research. The goal of the study underpinning this dissertation was to find out which factors contribute to a problem-free or problematic functioning of neighbourhoods in general and of early post-Second World War Dutch neighbourhoods in particular. Accordingly, a significant part of the book was dedicated to the measurement of neighbourhood success, which entailed constructing scale instruments based on survey data as well as objective parameters.

7.1 Answering research question one

The first research question was split into a methodological and an empirical part:

1a How can neighbourhood success be measured with scale instruments?
1b Which factors contribute to a problem-free or problematic functioning of neighbourhoods in general and especially of early post-Second World War neighbourhoods in the Netherlands?

Let me start with some general remarks on the advantage of using scales as outcome measures – of, for example, residential environmental satisfaction or nuisance, as described in this book – over and above using a single-item measure. A scale is a useful technique in a sociometric sense because it distinguishes clearly between measurement error and true scores. Using a multiple item scale is better: more information comes from combining different variables that are interrelated and describe the same underlying ordinal construct.

The first research question was elaborated in Chapters 2, 3 and 4. The point of departure for the thesis was the perspective of the residents, specifically their definition and perception of the success of their neighbourhood. The relationship between the person and the environment, with an emphasis on the way people perceive and experience their own neighbourhood, was an important (basic) principle. The data used in Chapters 2, 3 and 4 were mainly drawn from the *Housing Demand Survey* (WoningBehoefteOnderzoek 2002), a random sample of 75,034 respondents that is representative for the population of Dutch residents in 2002. The Housing Demand Survey is one of the most extensive sample surveys in the Netherlands and is held every four years. For specific analyses of neighbourhood characteristics, data from the *Woningmarktmonitor* (ABF, 2003) and the Wegener data file were also used.

The aim of Chapter 2 was to introduce an integrative and more comprehensive approach to the measurement of residential environmental satis-

faction. Domains of residential environmental satisfaction were empirically examined using techniques for multivariate analysis. The results of exploratory factor analysis gave empirical support for the usefulness of the theoretically proposed three-component model of residential environmental satisfaction. Three separate domains of success are distinguished. First, the resident's dwelling is perceived as appropriate. Second, the social climate in the neighbourhood is perceived as positive. Third, the internal reputation of the neighbourhood is evaluated in a positive way. Pattern detection in satisfaction severity groups indicated that satisfaction with the subdomain 'residential social climate' is the most significant component of overall residential satisfaction. This pattern prevails for Dutch neighbourhoods in general. I focussed on the early post-Second World War neighbourhood type that I characterized by the following three conditions: (1) at least half of the housing stock in 2003 was built between 1945 and 1980; (2) the share of the dwellings in the total housing stock of the postcode area is at least two standard deviations above the mean percentage of mid-rise flats in all Dutch neighbourhoods; (3) The housing stock in the postcode area is not predominantly (i.e. not over 50%) of another type. It now appeared that the association between residents of an early post-Second World War neighbourhood and residents evaluating their living situation as unsatisfactory has a monotone upwardly climbing tendency. Thus we can state that the early post-Second World War neighbourhood type must be called vulnerable because, in general, the people living there report significantly less residential environmental satisfaction compared to the residents of all other neighbourhood types.

The main objective of Chapter 3 was to introduce a comprehensive approach for measuring the frequency of perceived nuisance in the residential environment. To that end, it presented preliminary subgroup analyses investigating whether subsets of residents rate nuisance differently. A residential nuisance scale is empirically tested using multivariate analysis. The results of an exploratory factor analysis offer empirical support for the claim that the proposed model of reported frequency of residential nuisance is useful. Reliability and validity tests confirm the adequacy of the Residential Nuisance Scale – Dutch Language Version (RNS-DLV), since it correlates as expected with various criterion measures. Pattern detection in logistic regression analysis, with the RNS-DLV as the dependent variable and the individual scale items as the independent variable, sheds light on the extent to which nuisance is perceived by Dutch residents and specifically on where the reported nuisance comes from. It was demonstrated that litter on the street and noise pollution are the most significant factors contributing to the overall nuisance and that Dutch residents who occupy different dwelling types experience distinct kinds of nuisance. Focussing on the neighbourhood type that is central in this thesis, the results supported the hypothesis that people living in a early post-war mid-rise neighbourhood experience nuisance signif-

icantly more often than people who do not live in a neighbourhood of that type.

In Chapter 4 the results of the foregoing chapters were used to investigate the relationship between physical-spatial, demographic and economic risk factors, nuisance and environmental (dis)satisfaction. According to the literature on the vulnerability of neighbourhoods, nuisance and residential environmental dissatisfaction are related elements of one structure. I distinguished elements of the objective environment – such as percentage of single-family dwellings, proportion of immigrants, share of the housing stock that is not owner-occupied but private or social rental – and investigated the strength of their relationship to the residents' levels of environmental (dis)satisfaction. Two conceptual models were tested in multivariate analyses (zero- and partial-order correlations). Model 1 implied that these objective risk factors have a direct bearing on residential dissatisfaction. Model 2 assumed that the empirical relation between risk factors and residential environmental (dis)satisfaction also depends on a third variable, namely nuisance and disorder caused by residential behaviour.

Model 2 appeared to be plausible. It pointed to an empirical connection between risk factors and dissatisfaction. This model implied that residents living in a high-risk area are likely to report more stress caused by other residents than those residents not living in a high-risk area. It also implied that stress caused by other residents is associated with dissatisfaction.

Now, which risk factors were associated with the experience of extreme nuisance? Neighbourhoods with only dissatisfied residents are characterized by high population density and relatively small dwellings, built mainly in the period 1906-1960. The population of these neighbourhoods consists predominantly of immigrant groups. Compared to the neighbourhoods with moderately to strongly satisfied residents, the high-risk areas have more singles, people in the age group of 20-34 and inactive household heads. We can explain the extreme dissatisfaction and nuisance as follows: in anonymous and densely populated high- and mid-rise neighbourhoods where many residents are underprivileged, we can expect that due to cultural and linguistic barriers, especially between native and non-native groups, residents do not develop shared residential norms. Accordingly, an intermediary rule system is absent, and a critical mass of residents who are willing to altruistically punish norm defenders is lacking.

7.1.1 Buitenveldert's scores on the RESS, the RNS and the Risk Scale

What do we find when we look at the data of the case-study area in the database used for the construction of the outcome measures, respectively the RESS, the RNS and the Risk Scale? Buitenveldert appears to have a mean val-

ue of 3.64 on the transformed Risk Scale. The mean score of all Dutch neighbourhoods is 6.8. Buitenveldert differs statistically significantly from the mean of all other Dutch neighbourhoods (T = -58.95, df = 80,2, P = 0.000) and thus must indeed be called a high-risk neighbourhood.

Subsequently I compared Buitenveldert with all other neighbourhoods in the deciles 3 and 4 of the Risk Scale. I hypothesized that the residents of Buitenveldert, first, will be less annoyed by nuisance, and second, will be more satisfied. This proved to be the case: the mean score of Buitenveldert on the Nuisance Scale was 12.9. The mean of the other high-risk neighbourhoods was 13.7 (T = -22.8, df = 117.07, P = 0.000). The mean score of Buitenveldert on the Satisfaction Scale was 37.2. The other neighbourhoods' mean score was 38.7 (T = *.72, df = 84.3, P = 0.000).

7.2 Answering research question 2

The finding of Chapter 2 – that satisfaction with the residential social climate is significant for the overall residential satisfaction – and the outcomes of the preliminary research in the case-study area led to the second aim of the thesis: to investigate the proximate causes of a viable residential social climate. The theoretical aim was to investigate whether Behavioural Game Theory can explain the proximate causes of a viable residential social climate. Accordingly, research question 2 was split into a theoretical and an empirical question:

2.1 *Can central concepts of behavioural game theory describe and explain the proximate causes of a viable residential social climate?*

The empirical sub question is:

2.2 *What mediates the residents' willingness to contribute or not to the production and maintenance of collective residential goods?*

An important objective for this thesis was to demonstrate that Behavioural Game Theory, in combination with theoretical notions of social dilemmas, can offer useful tools for the analysis of residential interaction situations related to the production and maintenance of collective and public neighbourhood goods. In the Introduction (Chapter 1) and in Chapters 5 and 6, insights from Behavioural Game Theory and sociology were combined to study the emergence of well-defined collective residential goods. Even though Behavioural Game Theory cannot predict exactly how future interactions will take place, the post hoc analysis of interdependent choices and patterns – presented as games – makes us aware of the subtleties of human interactions in a social system (Elster, 2007).

In light of the criticism of game theory as described in Chapter 5, I have focussed on Behavioural Game Theory, which starts from the premise of bounded rationality. Secondly, I have defined the social dilemmas in terms of intentions, not outcomes. In this investigation, I found evidence that the insights and tools of Behavioural Game Theory (Camerer, 2003) are necessary and sufficient to describe and explain the interactions between residents making interdependent choices and acting repeatedly as producers and maintainers of the social climate (or, in terms of game theory, of collective and public goods) in their daily living environment. In the Introduction to this thesis I went into some detail on the main concepts of Behavioural Game Theory.

Starting the Introduction with a description of the preliminary study I had conducted in Buitenveldert, I came up with a working definition of a residential social climate which I further developed using concepts from the behavioural economic approach. A residential social climate refers to the social space in a residential neighbourhood where residents with diverse preferences interact, exchange goods and services, solve problems and dominate one another. These residential action situations and the participants that interact in them are defined by the (unwritten) rules participants use to order their relationships, by the physical-spatial attributes of the neighbourhood, and by the nature of the community within which the social climate exists. Rules, the physical-spatial attributes of the neighbourhood, and the nature of the community all jointly affect the types of actions that individuals can take, the benefits and costs of these actions and potential outcomes, and the likely outcomes achieved. After the theoretical framework was presented, I developed the following revised definition of a residential social climate:

For any residential neighbourhood N the proportion G of well-defined collective goods of all neighbourhood Objects O1,2,...n∈ ERS, is equal to the degree of viability of the social climate of the neighbourhood. Well defined means: (1) when common knowledge about the definitions of the collective goods exists among a significant subset of the residents of neighbourhood N; (2) when a significant subset of the residents of neighbourhood N intend to behave as strong reciprocators with regard to the collective goods; (3) when a significant subset of the residents of neighbourhood N agree on when and how to reciprocate in a negative or a positive way.

The concept of neighbourhood, like the concept of community, has many definitions and meanings across and within the social sciences. Given the breadth of what I already planned to tackle, I did not focus in detail on how various attributes of a neighbourhood affect the structure of situations within a community. Here, a neighbourhood is defined as the area that residents consider as their daily living environment. The attributes of a neighbourhood that have an important effect on the residential social climate include: the values of behaviour generally accepted in the neighbourhood; the level of

common understanding that potential participants share (or do not share) about the structure of particular types of action situations; the extent of homogeneity in the preferences of those living in a neighbourhood; the size and composition of the neighbourhood and the extent of inequality of basic assets among those affected.

When most residents share a common set of values and interact with one another in a multiplex set of arrangements within a small neighbourhood, the probabilities of their developing adequate rules and norms to govern repetitive social interactions are much greater (Taylor, 1987).

In Chapter 5 and 6 the game-theoretical framework was empirically examined by analysing the role of trust and altruistic punishment in the production and maintenance of collective neighbourhood goods in the problem-free early post-Second World War neighbourhood Buitenveldert-Amsterdam. As the results indicate, the strong dependency of a neighbourhood's viability on the willingness of its residents to intervene can be explained by the mutual trust that is built up by communication, including verbal sanctioning. The results of the case study demonstrated the importance of building a reputation for keeping one's word in the neighbourhood, and showed that the cost of developing monitoring and sanctioning mechanisms can be relatively low if an intermediary rule system is shared and maintained by a critical mass of residents that live in the area for a longer period.

Chapters 5 and 6 show that Behavioural Game Theory is appropriate for the description and explanation of the reasoning and behaviour of residents who perceive collective good games. The deductive methodology known as analytic narrative was used to blend Behavioural Game Theory and narration into the study of liveability problems. The results indicate that social norms are important as determinants of 'what types of games residents play', which in turn determines the degree of cooperative behaviour and the effectiveness of social control in a neighbourhood. What is perceived in Buitenveldert as inconvenience is formulated in – more or less unwritten – broadly accepted and operated rules and manners that serve as tools to balance between one's own, somebody else's and common interests.

The findings of the case-study research in this popular, rather problem-free CIAM post-Second World War neighbourhood are significant. They establish that voluntary cooperation and verbal sanctioning presuppose the existence of an intermediate system of unwritten rules or norms of good conduct. The intermediate rule system is construed and maintained independently of national legal systems. The social climate with well-defined collective goods in the case-study area has proven to be an effective system of informal social order. It keeps the neighbourhood safe and liveable even though the area belongs to a vulnerable neighbourhood type and even though it is not socio-culturally homogeneous.

The Buitenveldert case, corresponding to recent trends in American society,

shows that social mixing can work when members of different groups share certain core values and exhibit tolerance toward each other's beliefs and lifestyles. This implies that mutual trust and tolerance towards neighbours with another lifestyle, or another religious, cultural or ethnic background, are important preconditions for the development of a favourable social climate that does not discriminate or exclude certain groups or individuals. These results are in sharp contrast with writings emphasizing social tensions in ethnically mixed neighbourhoods. Nowadays, the population of Buitenveldert is rapidly changing in certain parts. This is due to the departure or decease of a large share of its elderly residents and to the influx of residents with different socio-cultural backgrounds. If the residents of a neighbourhood come from many different cultures, speak different languages, and are distrustful of one another, the cost of devising and sustaining effective rules is substantially increased. The question is, will the strong and viable social climate of Buitenveldert come under pressure? It remains to be seen if the social control mechanisms and the subtle communication strategies are strong enough to cope with such rapid change.

Another point this thesis has expanded on, a point of both theoretical and practical relevance, is the connection between the applications of Behavioural Game Theory in the field of urban studies – for which a first, albeit modest step has been made in this book – and the recent empirical results of experiments with the Broken Window thesis (Wilson & Kelling, 2007, Keizer *et al.*, 2008). The idea that the socio-economic environment shapes the costs and benefits of cooperation and altruistic punishment, and is thus likely to be an important determinant of social norms, seems to be widely accepted. But empirically as well as theoretically, we still do not know enough about the underlying processes. More knowledge in this area is necessary to gain a better understanding of which environment is likely to favour which norms and thus to be able to predict when norms are stable and when they will change.

The very popular and frequently adopted concept of collective efficacy is defined by Sampson and Raudenbush (2004) as cohesion among neighbourhood residents combined with shared expectations for informal social control of public space (Sampson, 2003). But the concept appears to be redundant when using the conceptual framework of Behavioural Game Theory. Collective efficacy can be translated into game-theoretical terms and indicators based on game theory can be used to measure it.

The preconditions for the operation of collective efficacy are not the same as the preconditions for strong reciprocity. Namely, when residents play a Nash equilibrium[1] strategy in an Assurance Game, they look for a best

1 A Nash equilibrium is the situation wherein all players in a game anticipate correctly on each other's choice and not any player has an incentive to change his or her strategy unilaterally.

response given the responses of others. If resident 1 anticipates correctly on what resident 2 will choose in an Assurance Game they do not necessarily experience a strong bond of attachment towards each other. Cohesion and collective efficacy imply simultaneity of action in face-to-face interactions. Strong reciprocity is needed in a context of sequential interactions. An intermediate system of unwritten normative rules facilitates sequential transactions between more or less unknown co-residents and strangers. Thus, for strong reciprocity, simultaneity is not a precondition. Any theory explaining the emergence of collective goods in a social system will have to deal with sequential transactions between strangers. The normative aspect of 'unwritten rules' implies that an actor will adhere to a norm not because of the characteristics of the interaction partner but because of the inherent value of the norm. Therefore, interaction partners can mutually trust each other without having to invest in a cohesive bond.

7.3 Policy implications and suggestions for further research

7.3.1 In general

In this book three scale instruments were developed and presented: the Residential Environmental Satisfaction Scale (RESS), the Residential Nuisance Scale (RNS) and the Risk Scale (RS). All three instruments generate important additional information for policy-making on urban renewal and neighbourhoods in general as part of a broader neighbourhood-monitoring instrument and as an independent indicator of liveability in residential neighbourhoods. The scales can be used on every level of aggregation – housing blocks, streets, neighbourhoods, cities – when connected to register data on the specific scale level. After determining the problematic areas on the specific aggregation level with the Risk Scale, residents can be asked to fill in the RESS and the RNS in order to analyse which specific problems are experienced by residents. Besides the quantitative research, more qualitative research methods must be applied to gain insight in which types of behavioural mechanisms and social interactions on the block level and in semi-public spaces are responsible for specific types of nuisance and which feedback loops are active that create a negative social climate. The residential environmental satisfaction scale or its abbreviated version, both described in this thesis, can help investigators conduct more selective and comparative research on neighbourhood life and the conditions for residential environmental satisfaction. So far, little has been published on ways to compensate negatively experienced attributes of the living environment by other residential attributes. In the future, these compact and valid instruments can serve as the dependent or independent variable in

research carried out in the Netherlands; and it is already used by researchers in other European and Asian countries (Qiao & Zhang, 2008; Wu, 2009, 2010) Such research could elucidate which physical-spatial and socio-cultural factors determine the perception of nuisance in different countries, cities and neighbourhood types by relating the RNS to the RESS and the Risk Scale.

Policy-makers who want to apply Behavioural Game Theory as an analytical tool with a rich and precise language should use the concept of 'unwritten rules' as an intermediate structure between law on the one hand and face-to-face interactions on the other. The findings of this thesis are significant in establishing that voluntary cooperation and verbal sanctioning presuppose the existence of an intermediate system of unwritten rules or norms of good conduct. This intermediate system can exist more or less independently of national legal systems. The conventional approach defines liveability problems from the perspective of a variety of legal systems. This has resulted in more police control and camera surveillance, but also in greater intolerance of residents who have different ethnic and cultural backgrounds. However, when explicit material incentives (fines, eviction) are applied to the task, there is a risk that voluntary cooperation and altruistic punishment will cease to occur because the preconditions for the operation of strong reciprocity are removed (see Gintis *et al.,* 2005: 20). Scholars who focus on material incentives must recognize that subtle verbal communication efforts can be very effective for turning what could be a Prisoner's Dilemma into an Assurance Game over time.

Social climate must be counted among the 'well defined collective residential goods' and can involve collective action. This means that individuals share the same goal and take action together in order to maintain the common goods. The specific character of the social climate in a certain area is determined by characteristics of the residents (lifestyle, age, religious and cultural background), the architecture, the available facilities (e.g. schools, shops, bus stops, playgrounds) and by the motivated maintenance actions of stakeholders (e.g. housing associations, local government and municipal services). Daily maintenance and social management are particularly important when vulnerable residents are concentrated in close proximity to areas that are physically unattractive or have multiple complications or bad reputations. Future investigations could shed light on the role stakeholders can play in maintaining a viable social climate by encouraging residents to participate in maintenance activities.

Empirical and theoretical work in the future should investigate how a large array of contextual variables affects various social processes: of teaching and evoking social norms; of informing participants about the behaviour of others and their adherence to social norms; and of rewarding those who use social norms, such as reciprocity, trust and fairness (Ostrom 2000, p. 154). More understanding is needed about the impact of institutional, cultural and physical-spatial contexts: how they affect the types of individuals who are recruit-

ed into and leave particular types of collective action situation; how they influence the kind of information that is made available about past actions; and how individuals can change the structural variables so as to enhance the probabilities of norm-using types being involved and growing in strength over time.

Further developments along these lines are essential for the development of public policies that enhance socially beneficial, cooperative behaviour based in part on social norms. It is possible that past policy initiatives to encourage collective action – policies based primarily on externally changing payoff structures for rational egoists – may have been misdirected. They might even have crowded out the formation of social norms that could have enhanced cooperative behaviour in their own way. Increasing the authority of individuals to devise their own rules may well result in processes that allow social norms to evolve and thereby increase the probability of individuals solving collective action problems (Ostrom, 2000, p. 154).

Social problems in neighbourhoods often stem from the conflicting social norms of different groups (Flache & Koekkoek, 2009). Such conflicts occur between elderly and younger residents or between residents with different ethnic, religious and/or socio-cultural backgrounds. Presumably these problems can be identified as Battles of the Sexes, which nourish in- and out-group perceptions and distrust. Follow-up research with an instrument designed according to the principles of Behavioural Game Theory could yield clearer reference points about how social tensions lead to discrimination and the exclusion of individuals or minority groups. Policy-makers and practitioners can intervene by introducing quasi-moral norms in problematic communities to generate respect and trust between people with different social norms. Additionally, a clear dialogue among professionals and residents about the definitions of the collective neighbourhood goods is of vital importance in the effort to prevent liveability problems and to encourage subtle communication strategies and other forms of altruistic punishment of norm defectors.

7.3.2 Specific

The findings presented in this book can provide pointers for professionals working in urban areas at either the neighbourhood or the municipal level. The following insights into physical and social aspects of residential areas may be of particular interest to practitioners.

Professionals working in the social sphere can play a key role in building a good social climate in neighbourhoods

There are neighbourhoods where an absence of informal social control is felt by a critical mass of the residents. They do not take it for granted that peo-

ple will reprimand their neighbours for anti-social or disruptive behaviour. In such cases, the first thing a professional wants to know is what has brought this situation about. Is it because people residing in the same apartment building, using the same entryway or living on the same street are not acquainted with each other and thus do not know exactly to whom they would then have to address their complaint? Or even though they usually know who the 'wrongdoer' is, are they shy about confronting him or her directly? Perhaps they do not speak each other's language and are therefore unsure how to approach the matter. Or are there simply no straightforward rules, so that everybody behaves as they wish or as circumstances dictate? These questions will have to be answered before anyone can set out a strategy for tackling the situation.

The next thing the professional wants to know is what people think of the current situation. What annoys them and what do they want changed? Various projects in Dutch cities have given professionals experience in tackling problems of civility. A well known example from Rotterdam is '*Opzoomeren*', a grass-roots initiative to lend a helping hand and spruce up the street (Van der Graaf & Duyvendak, 2001). Another is Rotterdam's rules of urban etiquette (Diekstra, 2001, 2004). Alternatively, people using the same entryway hold 'front porch' meetings. And elsewhere, the building management gets together with the residents to set up written rules for behaviour in and around the dwelling and post them in a way that the rules are visible and legible to everyone (thus, in several languages, if necessary). So doing, the professionals of the housing associations can establish a basic norm of how people should treat each other and the built environment. Thereby, they lay the basis (a ground of common knowledge) on which the residents of a street, shared entryway, or apartment building can adhere to the rules themselves and take one another to task when the rules are breached.

There is also a role for the professional when the residents, in fear of repercussions, do not dare complain directly to the person causing some nuisance. It is then up to the professional to find out why the troublemaker is behaving in that way and whether he is aware that he is bothering others. Depending on the particular problems that come to light, other social professionals would then have a role to play in resolving the problems on the troublemaker's part.

As the Buitenveldert case has clearly demonstrated, communication skills are important tools for the verbal sanctioning of norm offenders but also for the introduction of newcomers into the informal rule system that constitutes the social climate. Buitenveldert is exceptional because of the high educational level of its residents, who may therefore be presumed to have strong communication skills. Many neighbourhoods lack a population with such good communication skills, but they also lack a generally known, unwritten system of rules. By means of front porch conversations, housing professionals

and social workers can appeal to the social and communication competencies of the residents. The professionals can encourage people to confront each other about behaviour that harms collective interests or diminishes the residential satisfaction or privacy of another resident.

For example, in buildings where sound is easily transmitted between partition walls or floors, the residents could be informed about this. They can (if necessary) be motivated to adapt their behaviour within their dwelling so as not to annoy their co-residents. Where noise nuisance causes many residents to move away, an effective solution could be to insulate the dwellings better.

Prevent anonymity and build in intervisibility and a sufficient degree of social control

Every neighbourhood has a social order, and this plays an important role in its safety. Social control, particularly in the form of pointing out unacceptable behaviour to one's neighbours and people passing though, is a crucial element of that social order with regard to maintaining a sense of safety. In situations where that social order is poorly developed, usually as a result of widespread anonymity, people do not encounter one another. Thus, they do not know each other, so suspicion and a sense of insecurity can prevail. Then the danger looms that certain groups will come to dominate the public space while others will feel afraid and stay home; in that event, the social climate is not good. Poor street lighting, graffiti, scattered litter, closed security shutters, blind walls, vacant buildings and no sign of life in the evenings – these are the main ingredients of a recipe for increasing vandalism, aggressive behaviour and theft (Van der Voordt & Van Wegen, 1991; Adriaanse, 2010). How can the social climate of a neighbourhood be improved? What can be done to promote a sense of safety and stimulate the natural processes of social control? For one thing, the physical layout of a neighbourhood can contribute to a healthy degree of social control. First of all, anonymity can be avoided, thereby enhancing the intervisibility of the streets, by designing dwellings with windows and doors facing the street. This would not necessarily diminish the privacy of the occupants. The point is that everyone has a need, from time to time, to move anonymously through public space. People have to be able to be anonymous; what must be avoided is the negative anonymity of places (Altman, 1975; Hakkert & Keus, 2007; Van Dorst, 2005). Another approach is functional mixing – precisely what is now missing at many places in early postwar residential areas. It too can make an important contribution to the vitality of street life and thereby contribute to safety on the streets (Wassenberg & Blokland, 2008).

Make it clear who is managing what and engage the residents in the design and maintenance

A key condition for a good social climate is clarity about which places are be-

ing managed by which parties. This may be the housing association or the municipality, but it could also be a group of tenants or a single resident. Undesired anonymity can also be reduced by careful design and maintenance. The ambiance of a place is critical to a sense of safety and an attitude of involvement. Residents, better than anyone else, often know how to create a feeling of being at home in or around the building where they live. Involve the residents in the maintenance in a way fitting the specific neighbourhood and its population. Give them the room and the opportunity to shape their residential area themselves. The effects have been amply demonstrated in light of the Broken Window Theory.

Make use of public services, social seams and invented public spaces

The presence of 'social seams' is important for the development of common knowledge or public familiarity (Fisher, 1982; Blokland & Savage, 2008) among residents of a neighbourhood. Social seams are those points in the community where interaction – between, for example, different ethnic and racial groups – is 'sewn' together in some way, to borrow a metaphor from Jane Jacobs, who applied it in *The Death and Life of Great American Cities* (1961, p. 267). A similar concept is used by Elijah Anderson in *Streetwise* (1990). Even where people of different races and ethnicities may be living within small clusters of blocks, these seams can bring them together. In some cases, the seams may be the schools where children of different races and ethnicities come together on a daily basis and where parents interact in the course of parent-teacher associations and regular school events. Parks and special community-wide events can also serve as seams (Nyden *et al.*, 1997).

Thus, appealing, high-quality collective and public spaces and amenities that can function as social seams are important building blocks for the development and maintenance of a viable social climate. These are the spots where residents meet and come across each other. And 'by the way', they demonstrate to each other that they behave according to certain norms, that they have the necessary social competencies and correcting mechanisms of social control to maintain or improve the viability of the social climate.

Promote vitality and contact in the neighbourhood

One way to promote contact among various groups with a stake in the neighbourhood – visitors, businesses, property owners and residents – is to organize activities (Davelaar & Veldboer, 2008). Several municipalities have had good experience with this. For instance, annual barbecues, children's activities, a Santa Claus parade, or a Christmas market have been arranged. This brings people in contact and they become acquainted with one another. The municipality can for example set aside a budget for organizing the activities and the local businesses can play a supporting role in the actual arrangements (Wassenberg & Blokland, 2008).

Adapt public spaces in the residential environment and make use of knowledge and experience of users

Well developed public and green spaces that are adapted in the course of time in response to the changes and needs of the residential population are crucial conditions for a viable residential social climate. In 2006, more than half of the population of Buitenveldert was over fifty years old, yet there were more than eighty children's playgrounds there. Dating from the sixties when young families moved in, they are rarely used and often covered with grass. Many of them would better serve the current population if turned into semi-public meeting places for elderly people; this would require making the space accessible by transport equipment such as the scoot mobile and the walker. In Buitenveldert the synagogue, the church and the mother-child centre are important meeting places for specific identity groups. It is important to investigate which specific groups in a certain neighbourhood lack a meaningful meeting place. The experience-based knowledge of community workers, precinct police and residents is of great importance in the development of meeting places for specific groups.

Prevent wrong signalling of insufficient physical maintenance

Anti-social behaviour and neglect of shared collective goods and interests in the neighbourhood undermine the development of a viable social climate. When moral norms, social competencies and the correcting mechanisms of social control and altruistic punishment are absent at several spots in the neighbourhood, steps have to be taken to prevent a downward spiral of decline. A garbage bag that is put outside too early and a neglected front yard in a neighbourhood with a weak social climate give the wrong signal to other residents. Such signals of indifference evoke other negative behaviour. In a neighbourhood with a viable social climate, informal correcting mechanisms become active and residents confront each other about such behaviour. If this is not common practice, it is very important for professionals to prevent escalation by providing a minimum level of maintenance, thereby setting an example for keeping the area 'clean, whole and safe'.

Organize and facilitate surveillance within the community itself

A neighbourhood may have an unsafe hotspot of nuisance, for instance near a shopping centre. In that case, social control in the neighbourhood could be strengthened by organizing surveillance within the local community. The impetus would come from the municipality or the police, while the ensuing project would also involve other parties: the youth; the agency monitoring first-offender juveniles to keep them out of the courts *(Bureau Halt)*; the Public Prosecution Office; and private security companies. Various municipalities in the Netherlands have had good experiences with such projects.

Neighbourhood Fathers, Neighbourhood Parents, and Neighbourhood and

Street Coaches are examples of such projects. Housing associations, the local mosque, and social welfare organizations are often involved as well.

Another surveillance project is called Beware Watch Out. In this case, the guards participating in the project are themselves young delinquents who already have a record of multiple offences. The judge refers these offenders to the project instead of imposing a different sentence. The approach is two-pronged: serving as security guards, the youths are themselves (partly) responsible for safety in the shopping centre in their neighbourhood; and the young people learn useful skills that they have generally not been taught at home. Good results have been booked with this approach in the district of Osdorp (Amsterdam). Out of more than 350 juveniles taking part in Osdorp, a mere ten per cent have subsequently had contact with the police (Adriaanse, 2010).

Educate the house hunter about the social climate

The presence of specific identity groups in a neighbourhood can contribute to specific characteristics of the social climate. For instance, during an international football competition, the current residents might expect newcomers to deck out their front garden with flags and bunting in bright orange (the Dutch national colour).

For a sustainable social climate, it is important to strive for a good match between the lifestyle and preferences of the prospective new residents, on the one hand, and the specific traits of the neighbourhood where they are searching, on the other. When meeting with house hunters, the professionals of housing associations should give this point due attention and ascertain the specific social climate the house hunter is interested in. He then is able to better estimate if the prospective resident would fit in socially or not. When people move into a neighbourhood on the grounds of a positive locational choice, they are more likely to act on the basis of trust. By extension, they would be more willing to contribute to the development and maintenance of the collective neighbourhood goods.

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Samenvatting

Over het meten en verklaren van buurtsucces; een gedragseconomische benadering

Carlinde Adriaanse

Het doel van het onderzoek dat ten grondslag ligt aan deze dissertatie is om te onderzoeken welke factoren eraan bijdragen dat sommige buurten wel en andere niet problematisch functioneren; het onderzoek spitst zich toe op de vroeg-naoorlogse middelhoogbouwbuurten. Het proefschrift presenteert een drietal instrumenten die van belang kunnen zijn voor sociaal wetenschappelijk onderzoek naar de tevredenheid van bewoners met hun woonomgeving. Daarnaast wordt een visie ontwikkeld op de bruikbaarheid bij buurtonderzoek van een theorie die bekend staat als 'behavioural game theory'.

De dissertatie kent twee onderzoeksvragen. De eerste onderzoeksvraag kent een methodologische en een empirische subvraag:

1a. Op welke wijze kan buurtsucces gemeten worden met schaalinstrumenten?
1b. Welke factoren dragen bij aan het meer of minder succesvol functioneren van Nederlandse buurten in het algemeen en van vroeg-naoorlogse buurten in het bijzonder?

Het theoretische doel van dit proefschrift is om te onderzoeken of centrale concepten ontleend aan behavioural game theory, een verklaring kunnen bieden voor de werking van een sociaal buurtklimaat. Onderzoeksvraag twee heeft hier betrekking op en kent de volgende theoretische en empirische subvraag:

2.1 Kan behavioural game theory de oorzaken van een wenselijk sociaal buurtklimaat adequaat beschrijven?
2.2 Welke kenmerken van bewoners bepalen of zij bijdragen aan het produceren en het onderhouden van collectieve buurtgoederen?

In het eerste hoofdstuk wordt onder meer beargumenteerd dat wetenschappers, zowel in behavioural game theorie als in vragenlijstonderzoek, het verschil tussen ordenen, sorteren en classificeren enerzijds en meten anderzijds vaak negeren. Sociale wetenschappers en speltheoretici gaan hand in hand in de veronderstelling dat, wanneer men orde en regelmaat constateert, er ook gekwantificeerd kan worden. Bedoelde veronderstelling hangt samen met de adoptie van een representationalistische meettheorie. De centrale gedachte van deze theorie is dat meten het afbeelden is van waargenomen kwalitatieve relaties binnen een empirisch relationeel stelsel, in het getallenstelsel. Het is evident dat het omarmen van een representatieve meettheorie leidt tot de door Stevens (1946) verdedigde visie dat meten niets meer is dan de toekennen van getallen aan entiteiten volgens een regel. Het kwantitatief zijn van

een kenmerk is echter een wetenschappelijke hypothese waarvan het bewijs geleverd moet worden door de empirische wetenschap. Dit bewijs is ten aanzien van kenmerken zoals 'utiliteit', 'satisfactie' en 'perceptie' nog niet geleverd.

De hoofdstukken 2, 3 en 4 zijn voornamelijk gebaseerd op de data van het WoningBehoefteOnderzoek 2002, een aselecte steekproef van 75.034 respondenten, representatief voor de Nederlandse bevolking in het jaar 2002. Voor specifieke analyses van buurtkarakteristieken zijn eveneens data gebruikt van de Woningmarktmonitor van ABF en van Wegener. Voor de analyses op het niveau van de buurt zijn postcodegebieden gebruikt. De hoofdstukken twee en drie twee presenteren een vragenlijst met respectievelijk 'bewonerssatisfactie' en 'ervaren overlast' met meetpretentie. In deze beide hoofdstukken is – in het licht van hetgeen is besproken in hoofdstuk 1 – sprake van een numeriek verfijnde manier van sorteren en ordenen. Aannemende dat satisfactie en ervaren overlast beide meetbare kenmerken zijn, hoewel het bewijs voor de meetbaarheid dus nog niet is geleverd, is het in dit proefschrift gewaarborgd geacht om statistische analysetechnieken zoals factoranalyse, logistische regressie en t-toetsen te gebruiken.

De resultaten van een exploratieve factoranalyse in het tweede hoofdstuk geven empirische grondslag voor de bruikbaarheid van het theoretisch model dat duidt op drie componenten van woontevredenheid. De volgende drie domeinen van woontevredenheid worden onderscheiden. Ten eerste, de passendheid van de woning. Ten tweede, de waardering van het sociaal klimaat in de buurt. Ten derde, de wijze waarop de interne reputatie van de buurt wordt geevalueerd. Vervolgens bleek uit nadere analyses onder ernstgroepen binnen de respondentengroep de tevredenheid ten aanzien van het subdomein 'residentieel sociaal klimaat' de meest significante component te zijn van woontevredenheid. Dit patroon is van toepassing op alle Nederlandse buurten. Er is speciaal gekeken naar het vroeg-naoorlogse buurttype. Er blijkt sprake te zijn van een monotoon stijgend verband tussen het wonen in een vroeg-naoorlogse buurt en het ontevreden zijn met de woonsituatie. Om die reden stellen we dat het vroeg naoorlogse buurttype inderdaad kwetsbaar genoemd moet worden.

In het derde hoofdstuk wordt een vergelijkbare exercitie uitgevoerd op een overlastvragenlijst. Relevant om te vermelden is het gebruik van multivariate statistische technieken bij deze ordinale data. Logistische regressie is in staat 92 procent van de bewoners correct te plaatsen in twee ernstgroepen op basis van vier klachten: 'zwerfvuil', 'hondenvuil', 'lawaai-' en 'verkeersoverlast'. Zwerfvuil blijkt, ongeacht de bezitsvorm en de waarde van een woning, de belangrijkste klacht te zijn die onderscheid maakt tussen weinig en veel overlast. Ten slotte blijkt dat overlastklachten niet gerelateerd zijn aan leeftijd, geslacht en opleidingsniveau. Kijken we speciaal naar het vroeg-naoorlogse middelhoogbouw buurttype dan blijkt dat bewoners die woonachtig zijn

in een dergelijke buurt, significant vaker overlast ervaren dan bewoners van andere buurttypen.

Het vierde hoofdstuk bespreekt een risicoschaal. De kenmerken waar deze schaal gebruik van maakt zijn kwantitatief, te weten 'inkomen', 'WOZ-waarde', 'ratio koop-/sociale huurwoningen', 'ratio koop-/particuliere huurwoningen' en het 'percentage immigranten'. De metrische data zijn dimensieloos gemaakt door ze te transformeren tot variabelen met waarden tussen de -1 en 1. Vervolgens zijn de betrouwbaarheid, de validiteit en de dimensionaliteit van de schaal onderzocht. De betrouwbaarheid bleek uitstekend met een Cronbach's alpha-waarde van 0.91. De validiteit is bepaald door correlaties te berekenen met de variabelen 'het percentage kinderen op de basisschool van ouders met een lage opleiding', 'het percentage allochtone kinderen op de basisschool van ouders met een lage opleiding' en 'het percentage werkloze ouders'. Alle correlaties zijn hoog en negatief. Een principale componentenanalyse vindt één factor die 71 procent van de variantie op de risicoschaal verklaart. Het instrument blijkt betrouwbaar, valide en één-dimensionaal.

Via een lineaire transformatie werd er een elfpunts-risicoschaal van gemaakt. Met nul als meest kwetsbare buurt en tien als een buitengewoon succesvolle buurt. Vervolgens zijn de relaties tussen risico, satisfactie en overlast onderzocht. De samenhang bleek sterk te zijn. De respondenten zijn in vier ernstklassen ingedeeld op de satisfactie- en de overlastschaal waarna is onderzocht hoeveel procent van de bewoners tot een ernstklasse behorend, woonachtig was in een buurt behorend tot een bepaald deciel van de risicoschaal.

Uit deze analyse blijkt dat er een monotoon dalend verband is tussen zeer ontevreden en zeer veel overlast en de score op de risicoschaal. Bovendien blijkt dat in de buurten met een nulscore op de risicoschaal honderd procent van de respondenten extreem ontevreden is en extreme overlast ervaart. Dit zijn buurten met kleine woningen, veel flats, gebouwd in de periode 1906-1960, een hoog percentage alleenstaanden, mensen in de leeftijdsgroep van twintig tot en met vierendertig jaar en veel werklozen. Met name het histogram in hoofdstuk 4 van dit boek maakt duidelijk dat het sorteren van bewoners op ontevredenheid veel informatie kan geven indien we de sortering op decielen bijvoorbeeld relateren aan het woonachtig zijn in een risicobuurt. Van de zeer tevreden bewoners woont maar 2 procent in een risicobuurt, voor de zeer ontevreden bewoners is dat 14 procent.

Voor de hoofdstukken 5 en 6 is in de hoog-risicobuurt Buitenveldert-Amsterdam kwalitatief verdiepingsonderzoek verricht. Buitenveldert-Amsterdam moeten we op basis van haar score van 3.64 op de risicoschaal inderdaad een risicobuurt noemen. De bewoners van Buitenveldert scoren echter significant lager op overlast en significant hoger op satisfactie dan bewoners uit buurten in het hetzelfde risicosegment.

Dit is opvallend en vraagt om een verklaring. De vraag is nu hoe een beter

inzicht te verkrijgen in de mechanismen die werkzaam zijn op het microniveau van interacties tussen bewoners in relatie tot collectieve buurtgoederen. Vragenlijstonderzoek leent zich hier niet goed voor en het uitvoeren van een experiment of veldexperiment was niet mogelijk. De best passende aanpak is dan het combineren van de kwantitatieve gegevens met de kwalitatieve methode van het semi-gestructureerd interviewen van bewoners (triangulatie). Centrale concepten uit de behavioral game theory – strong reciprocity en altruïstisch straffen in Prisoner's Dilemma's en Assurance Games - bleken een uitstekend analytisch kader te bieden voor de analyse en interpretatie van de interviewgegevens.

Om de interviewgegevens zo eenduidig mogelijk te kunnen interpreteren op conceptueel vlak in de door speltheoretici beschreven interacties, zijn 'intenties' en 'opbrengsten' scherp van elkaar onderscheiden door het Prisoner's Dilemma (PD) en het Assurance Game (AG) te formuleren als kenmerken van een individuele intentie. In het proefschrift worden acht kenmerkende aspecten beschreven van de intentie van een PD- of AG-speler ten opzichte van een welbepaald collectief goed. Speltheoretisch bezien is het voornaamste kenmerk van een PD dat het een niet-nulsomspel is. Is het in dergelijke situaties beter om samen te werken met de ander of om voor de snelle winst te gaan? Als men voorziet dat een dergelijke situatie met dezelfde partijen vaker zal voorkomen is het beter om samen te werken (en beide te zwijgen in het voorbeeld). Is de ontmoeting eenmalig dan kan dit anders liggen. Nogal wat problemen in buurten vertonen overeenkomsten met het PD. Het gaat dan niet meer om twee mensen die wel of niet samenwerken, maar om vele mensen. Evenmin is er sprake van een eenmalige keuze, maar dient er steeds opnieuw gekozen te worden. We spreken dan van een gegeneraliseerde PD-situatie. Afval opruimen en het trappenhuis schoonmaken zijn voorbeelden van een gegeneraliseerde PD-situatie.

Het idee van het AG komt uit een tekst van Jean-Jacques Rousseau die een situatie beschreef waarin twee individuen op jacht gaan. Beiden kunnen ervoor kiezen om op een hert of een haas te jagen. Elke speler moet een actie kiezen zonder te weten wat de ander besluit om te doen. Als iemand ervoor kiest om op een hert te jagen, dan moet hij de medewerking hebben van de andere persoon om te kunnen slagen. Een haas kun je in je eentje vangen, maar die is minder waard dan een hert. Dit voorbeeld wordt beschouwd als een belangrijke analogie voor cooperatie. Het AG verschilt van het PD in het feit dat er sprake is van twee Nash equilibria: één als beide spelers samenwerken en één als beide spelers niet besluiten tot samenwerking. In het PD derhalve – ondanks het feit dat een situatie waarin beide spellers samenwerken Pareto-efficiënt is – bestaat het enige Nash equilibrium er uit dat beide spelers ervoor kiezen niet samen te werken.

Het bleek dat in Buitenveldert bewoners vooral intenties hadden die structureel overeenkomen met de intenties van een speler in het Assurance Game.

In tweehonderd interviewfragmenten van bewoners over beheer en onderhoud van collectieve buurtgoederen, waaronder de gezamenlijke entreehal en galerij, de gezamenlijke tuin, straat en gemeenschappelijke berging, bleek de prevalentie van Assurance Game intenties 87 procent te bedragen.

Met andere woorden, bewoners in een, volgens objectieve criteria, kwetsbare buurt zijn uitstekend in staat met elkaar een goed leefklimaat te creëren. Dit doen zij via een intermediair systeem van ongeschreven regels. Daarbij spelen subtiele communicatieve vaardigheden – een specifieke vorm van altruïstisch straffen – een sleutelrol bij de overdracht van regels aan nieuwe bewoners en bij het aanspreken van bewoners die deze regels overtreden.

Curriculum vitae

Carlinde Adriaanse was born on the first of January 1964 in Middelburg. In 1986 she received her secondary-school (VWO) diploma from the Christelijke Scholengemeenschap Walcheren in Middelburg and commenced a teacher-training programme in drawing and social studies (HBO) at the VLVU in Diemen-Amsterdam. After that she went to Utrecht University to study General Social Sciences, specializing in Urban Studies with major modules in Planning and Environmental Sciences. She graduated in 1993, having written her Master's thesis on ecologically sustainable lifestyles entitled Levensstijlen en ecologisch verantwoord wonen; een onderzoek naar de relatie tussen inrichtingselementen, beheerregimes en menselijk gedrag. She was a student assistant during the final year of her study at Utrecht University, and after receiving her Master's degree she became a junior researcher at the same department. There, she collaborated with colleagues on a range of research projects, particularly concerning the significance of social networks, social cohesion, segregation and integration and the quality of life in urban and rural areas. In 1998 she accepted a job as a researcher at a housing association ('Stadgenoot', formerly 'Het Oosten') in Amsterdam and worked there till 2001. In that period she developed projects for the organization with the aim of improving liveability in housing projects and neighbourhoods in Amsterdam. In 2001 she started a job as a researcher at Movisie (the former Netherlands Institute for Care and Welfare) and worked on the topic of local social policy in rural areas in the Netherlands, a project commissioned by the Ministry of Agriculture and the Ministry of Spatial Planning and the Environment. In 2003 she joined the OTB Research Institute for the Built Environment, located at Delft University of Technology, where she has been involved in both fundamental and contract research. At the Department of Urban Renewal and Housing she has been one of the driving forces in knowledge exchange activities within the Corpovenista research programme. This programme aims to develop and improve instruments for the renewal of city districts, the strategic housing stock policy and urban (re)development. Her PhD started as part of the Corpovenista research programme. In recent years she has also worked together with researchers in the field of Urbanism in a research project on value creation in neighbourhoods. At the moment she is participating in NICIS projects on the role of lifestyles in area development and housing allocation.

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