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Residential Mobility and Neighbourhood Effects: A Holistic Approach
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Abstract

The number of studies estimating neighbourhood effects has increased rapidly during the last two decades. Although results from these studies vary, a majority find at least small effects. But to what extent can we trust these estimates? Neighbourhood effect studies face many serious methodological challenges, of which some are related to the fact that people move. The mobility of individuals may cause neighbourhoods to change over time, result in exposure times that are too short and seriously bias estimates. These methodological problems have not been given enough attention in the neighbourhood effect literature: no study controls for them all, and implications of mobility are rarely included in theoretical discussions of neighbourhood effects.

In a comprehensive summary and five different papers, I argue that the two scholarly fields of residential mobility and neighbourhood effect studies are intrinsically connected and that any arbitrary separation between the two is both conceptually problematic and risks leading to erroneous conclusions. Studies of neighbourhood effects must address the problems caused by mobility, before it can be convincingly argued that results actually show neighbourhood effects. To do this, longitudinal data are necessary. Furthermore, the connection between the two fields may also have implications for studies of residential mobility.

Keywords: neighbourhood effect, residential mobility, selection, method, bias

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This is a thesis about the connections between local context and mobility: mobility affects context and context affects mobility. In the thesis, context equals neighbourhood and mobility equals moving home. With more open definitions, I could have ended my thesis after these acknowledgements and still proven my points. My years as a PhD student have indeed been about mobility – personal, social and physical – affected by context. I have moved from being confused but eager to learn to having produced this book (I leave it to others to decide whether this moving career was ‘upward’). I have also moved from the Department of Social and Economic Geography to the Institute for Housing and Urban Research (IBF) (both Uppsala University), via a few months at the Centre of Housing Research (CHR) and School of Geography and Geosciences at the University of St Andrews. I have these contexts to thank for making my mobility possible.

Two persons have stood by my side regardless of location. They are my main supervisor, Roger Andersson, and my assistant supervisor, Irene Molina. Roger and Irene have been invaluable to my work with their never-ending enthusiasm, support, helpful and critical comments and not least because they have given me the space to plan and conduct my own work.

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My first co-author was however Åsa Bråmå. Together, we wrote and presented the first paper I have ever tried to write, using methods that were new to me. Åsa introduced me to the world of quantitative journal articles, SPSS, and regression analyses, and she explained all this to me with admirable patience.

Hans Aldskogius, Lena Magnusson Turner and John Östh have scrutinized the final draft, and their constructive criticism helped improve the re-
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But writing a thesis is not a 24/7 job – at least not in my case. My journey would never have taken me this far hadn’t it been for those making my spare time fun and rewarding. So thank you, dear friends, for giving me things to discuss, think about and do that have nothing to do with either mobility or neighbourhood effects. Thank you, dear family, for constant support. Thank you, David, for everything.

Gävle, October 2011.
List of Papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals:


IV Hedman, L. (2011) Moving near family? The influence of extended family on neighbourhood choice in an intra-urban context. Accepted for publication in *Population, Space and Place*.


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1. Introduction

A few years ago, my partner and I thought about buying a house. We searched for one that we could afford but that still matched our preferences regarding size, standard, location and design – not too big or small, one or two floors, in need of renovation, in a relatively central location, with a garden and with good access to green areas. Neither of us knew exactly where we wanted to live but there were a few neighbourhoods that we found appealing and to which we directed our search. All of these were quiet villa areas located within biking distance of the railway station. They were all familiar to us, either through friends living in these areas or because we had passed through them fairly often. There were also certain neighbourhoods in which we did not want to live. They did not match our criteria, were located far away (from where we lived at the time), were areas with which we were unfamiliar, or which had a bad reputation in our social circuits.

Eventually, we found a house that seemed attractive to us: it was the right price and size, it was located near the city centre and railway station, and the area had good access to grocery stores and other services. But when I mentioned our plans to my father, his response was: “Are you sure you want to live there? Then your children would go to the [local] school, and you know how much problems they have!” My father, who was a teacher, assumed that our (future) children would be affected negatively by the school environment in that neighbourhood and that we, who had the possibility to move elsewhere, should choose an alternative destination. We never bought the house.

This is a thesis about residential mobility and neighbourhood effects, and the interconnectedness between these two fields. The above story from my own life has several dimensions that illustrate this interconnectedness. First, it illustrates how households choose destinations when moving. It shows that the choice of destination is based on a combination of dwelling and neighbourhood attributes in relation to the household’s preferences, resources and other constraints. In our case, we had a list of demands as well as of things we wanted to avoid that, together with our knowledge of the city and its various areas, shaped our search space. Eventually, we found a house that matched all these criteria and was affordable to us. However, due to the information available to us, we finally decided not to buy the house and thus avoided moving to an area we learnt had problems. It is possible that the
eventual buyers did not have access to the same kind of information or that they were more restricted in their ability to choose or that their preferences were different. On a macro level, all these decisions made by households transform into aggregate patterns of neighbourhood sorting.

Second, the story illustrates the (assumed) neighbourhood effects argument (or, in this case, school effects). My father assumed that our children would be negatively affected by attending this local school instead of a – in his opinion better – school in another neighbourhood. He might have thought that the low standard of the school would harm our children, or that the other children would have a bad influence on them through negative role modelling or peer pressure.

Third, the story touches upon the interconnectedness of the fields of residential mobility and neighbourhood effects. In our case, the prospect of negative neighbourhood effects affecting our children influenced our mobility decision to the extent that we decided not to buy the otherwise attractive house (and thus avoided the neighbourhood). At the same time, our choice of another neighbourhood and the potential in-mobility to this neighbourhood of a household with fewer socio-economic resources is likely to be a contributing factor to the problems encountered in this school. Thus, selective mobility processes are likely to be part of the cause of the school problems in this area (and thus the negative effects), and the school problems in turn result in continuing selective mobility as we and many others with enough resources tend to avoid the area.

The aim of this thesis is to provide an argument for the connectedness of the two fields of residential mobility and neighbourhood effect studies respectively. Although it is well known in the neighbourhood effect literature that the fields are to some extent connected, this connection has not been given enough attention. Residential mobility is rarely included in the theoretical discussions of neighbourhood effects and no study as far as I am aware attempts to control for all methodological problems that arise as a result of this connection. My impression of the literature, given the way residential mobility is discussed or not discussed, is that, with some exceptions, it is seen as something that affects segregation levels and the population composition of neighbourhoods, or alternatively as something that could help people ‘escape negative effects in poverty areas’. If this was the full story, there would be no need to include mobility in theoretical frameworks or empirical models since it would only indirectly affect estimates of neighbourhood effects. I argue, however, that this supposition is wrong.

In this thesis, I propose a ‘holistic’ framework that includes both fields of residential mobility and neighbourhood effects. Building on previous research in both fields and the empirical studies that are part of this thesis, this framework portrays the two fields as intrinsically connected. I argue that not only do moving patterns affect neighbourhood effect studies via effects on patterns of residential segregation; neighbourhood effects also affect moving
patterns since they might result in changes in the characteristics of neighbourhoods, whether physical or related to population composition or changes in aggregate behaviour. Furthermore, these two fields may also affect each other directly, through behavioural changes due to mobility or neighbourhood effects on mobility. All of these potential connections are further elaborated in Chapter 3 and in Paper I.

The connections between the two fields of residential mobility and neighbourhood effect studies respectively, portrayed in the holistic framework, result in four methodological challenges when estimating neighbourhood effects: problems related to exposure time, potential neighbourhood change, selection bias, and endogeneity bias. Although these are not by any means unknown in the neighbourhood effect literature, I argue that they have not been given enough attention, neither in theoretical frameworks nor in empirical studies (see Paper I). A failure to meet these challenges might result in poor argumentation and erroneous results, where results that are perceived as neighbourhood effects may in fact be the result of other factors. Since many previous studies do not sufficiently meet these challenges, they cannot, in my view, be regarded as convincing estimates of neighbourhood effects.

The thesis is written principally as a critique of the field of neighbourhood effect studies. My main arguments (and empirical results) refer to the problems that a distinction of residential mobility studies and neighbourhood effect studies have for the neighbourhood effect literature. My approach to this, however, is to empirically look into processes of neighbourhood selection. The empirical mobility studies serve to highlight (some of) the processes that cause methodological challenges for neighbourhood effect studies but I also argue that a better understanding of neighbourhood selection and other mobility-related processes is necessary to incorporate these into studies of neighbourhood effects.

Central concepts

Concepts related to residential mobility

In this thesis I discuss residential mobility, i.e. short-distance moves within a local housing market (often a city). In the literature, residential mobility is distinguished from migration, which refers to long-distance mobility. Although there are clear (albeit under-researched) links between migration and residential mobility, especially in terms of research questions, theoretical frameworks and empirical strategies (see Clark and Huang, 2004), there are also differences in all these realms that justify treating them as two separate fields of research. Residential mobility is also distinguished from other forms of mobility, such as physical mobility that is not related to moving
home, e.g. commuting or other kinds of travel, and social mobility, i.e. climbs up or down the social ladder.

When I use the term ‘residential mobility’ in a more general manner, I refer to both micro-level decisions and macro-level patterns. Micro-level decisions are often theoretically divided in the literature into two separate decisions: the choice to move and choice of destination. On a macro level, these correspond to in- and out-mobility patterns to and from neighbourhoods. Both in- and out-mobility are part of the holistic framework I propose. However, the focus in the thesis is on in-mobility.

*Neighbourhood choice (neighbourhood selection)* is used to describe households’ choice of destination. It thus refers to mobility decisions on the micro level. The word ‘choice’ highlights that individuals and households make active decisions about where to live. However, the degree of choice differs substantially among households. Some people may want to leave their neighbourhoods but cannot do so; others find themselves very restricted in terms of what neighbourhoods they can choose among, due to limited resources and other restrictions (see van Kempen and Özüekren, 1998; Özüekren and van Kempen, 2002). However, while recognising that some individuals have very limited choices on the housing market, I argue that basically everyone has some degree of choice. This choice may be between two unattractive alternatives, but the mover is still likely to choose the destination that best matches his/her needs and preferences. This might seem like a small point to make but it is important for the following discussion. The fact that neighbourhoods are composed of individuals and households that, for some reason, have chosen to live there is the core of the selection bias problem.

Households’ choice of neighbourhood on the micro level results in *patterns of selective mobility (neighbourhood sorting)* on the macro level, i.e. patterns where some groups move to certain types of neighbourhood while others move to other types of neighbourhood. An example is income sorting, where those with higher incomes tend to be over-represented among in-movers to more expensive areas whereas those with lower incomes generally are over-represented among in-movers to lower-income neighbourhoods. Selective out-mobility patterns also contribute to neighbourhood sorting where, for example, those who experience income gains are over-represented among out-movers from low-income neighbourhoods. Together, all these processes result in residential segregation on the basis of income.

**Concepts related to neighbourhood effect studies**

One of the most important concepts in this thesis is, obviously, ‘neighbourhood effect’. A *neighbourhood effect* (contextual effect, externality effect) is a *causal* effect of (some component of) the residential environment on various outcomes (e.g. individual income, educational achievement, risk of en-
gaging in criminal behaviour etc.). That is, a person living in a particular environment will be more (or less) likely to experience a certain outcome compared to if he or she had lived somewhere else. Neighbourhood effects are transmitted via one or several mechanisms, e.g. social interaction among neighbours, the relative location of the neighbourhood in respect to other functions and institutions, the physical structure of the neighbourhood, and neighbourhood stigmatisation. These mechanisms and other theoretical issues are discussed in Chapter 2.

*Exposure time* is the time that an individual is ‘exposed’ to something, in this case a neighbourhood or, rather, the conditions and neighbourhood effect mechanisms in a specific neighbourhood. When I discuss exposure time, I refer to the time the individual has *resided* in a specific neighbourhood. In reality, however, the exposure time can be either shorter or longer, depending on how much time the individual spends in the neighbourhood relative to other places. Many adults work outside their neighbourhoods. They travel, visit friends, and engage in leisure activities outside their neighbourhood, which restricts exposure time to their neighbourhoods of residence. On the other hand, it is also possible that they have been frequent visitors to their current neighbourhood before living there, which could extend their exposure time.

*Selection bias* is a statistical bias that may arise when the allocation of people into categories or groups is not made randomly, as is the case when people choose their neighbourhoods. If this allocation into groups is correlated with a characteristic that is not included in the analysis, and this unmeasured characteristic also is statistically correlated with the error term in the analysis, results may be biased. For example, if the allocation of people into neighbourhoods is correlated with individual income, income is correlated with likelihood of engaging in criminal activities, but the income variable is excluded from the equation estimating how neighbourhoods affect the likelihood of engaging in criminal activities, the effect that is due to income may be erroneously attributed to the neighbourhood.

Selection bias is by many regarded as one of the most serious problems facing neighbourhood effects research (see Jencks and Mayer, 1990; Duncan et al., 1997; Pickett and Pearl, 2001; Galster, 2008). However, it is mostly treated as a statistical problem to be dealt with via econometric operations (see Paper I). Although these techniques remove (most of) the bias, I argue that alternative techniques that involve modelling neighbourhood selection would be more fruitful as they would benefit both fields of residential mobility and neighbourhood effect studies. To quote Sampson and Sharkey (2008, p. 1): “selection is much more than a statistical nuisance when we consider its implications for inequality in neighbourhood attainment and broader population processes”.

*Endogeneity bias* is a statistical bias that arises when there is a correlation between a variable and the model’s error term, which makes it difficult to
identify true causality. One source of endogeneity bias is that the choice of neighbourhood is often made jointly with other decisions. The choice of neighbourhood includes choice of a range of housing and neighbourhood attributes, as well as the decision to move at all, that may be correlated with the outcome. This makes it difficult to isolate the causal effect from the neighbourhood. Another source of endogeneity bias is that factors that affect mobility also could be causally affected by the neighbourhood of residence, resulting in a complicated loop of causality. For example, there are neighbourhood effect studies that have found effects on (teenage) pregnancies and income, and both childbirth and income are well known to affect mobility decisions. The two simultaneous models of income sorting and neighbourhood effects on income run in Paper V are an example of a system of models where the dependent variables are endogenous. The paper also offers a potential solution to this problem via the use of instrumental variables that replace the endogenous variables.

Aim and research questions
The main aim of the thesis is to provide a theoretical framework that includes both fields of residential mobility and neighbourhood effect studies. The two fields have previously been discussed within the same study, but often as separate fields connected by residential segregation (see, e.g., Musterd, 2005). Residential mobility, or rather the selective mobility patterns with, for instance, high-income people moving into high-income neighbourhoods and members of ethnic minorities moving into immigrant-dense neighbourhoods, is one important component in the reproduction of residential segregation over time. Neighbourhood effect studies are sometimes said to analyse consequences of residential segregation and especially of living in deprived neighbourhoods. They explore whether residential segregation in itself enhance inequality, e.g. by restricting opportunities for those living in the poorest areas. I argue, however, that the interconnectedness between these two fields of study is more complex than a simple ‘cause and consequence’ relationship. Through reviews of previous studies in both fields, analyses of connections between them, and by conducting my own empirical studies of primarily neighbourhood selection processes (Papers II to V) but also of neighbourhood effects (Paper V), I have come to the conclusion that the two fields of residential mobility and neighbourhood effect studies are not only connected via residential segregation but that processes of mobility also have a direct effect on neighbourhood effect studies, both in theoretical frameworks and empirical studies. For example, as mentioned earlier, the mobility of households affects exposure time to neighbourhoods and ‘sufficient’ exposure is a necessity for neighbourhood effects to occur, according to neighbourhood effect theory.
Furthermore, I aim to discuss methodological consequences of this interconnectedness, i.e. the methodological challenges that face neighbourhood effect research that are directly related to the fact that people move. These challenges are already presented briefly and will be discussed in more detail in Papers I, II and V. Previous research has to some extent met some of these methodological challenges. Other challenges caused by mobility are rarely met or discussed in empirical studies of neighbourhood effects. During my reading of the literature, I have found no study that meets them all in a satisfactory way. (See Paper I for a discussion of how previous literature has dealt with the methodological challenges I discuss in the thesis.)

The aims of the thesis can be broken down into two main research questions:

- How are the two fields of residential mobility and neighbourhood effect studies connected theoretically?
- What are the methodological consequences of this interconnectedness? How can these challenges be addressed?

In the thesis, I focus especially on selection bias, a problem that arises because moving households select their destination. A better understanding on how households choose neighbourhoods would thus enhance the general understanding of the processes behind selection bias. There is already much knowledge on the timing of moves and how mobility relates to the characteristics of the individual versus the characteristics of the dwelling. Less is known about how different neighbourhood factors affect neighbourhood choice. In my empirical studies, I have chosen to focus especially on these neighbourhood characteristics and how they affect neighbourhood selection among various groups of people. An additional research question is thus:

- How do different neighbourhood factors affect how various population groups choose neighbourhood when moving?

Outline of the thesis

The thesis consists of two, or six, parts: a comprehensive summary (*kappa*), and five separate papers. The comprehensive summary could be seen as a combination of an introduction to the thesis and a summary of the same. In this comprehensive summary I present the aim of the thesis, the research questions, discussions about data, and some general conclusions. I also provide a general overview of the theoretical framework I adopt in the thesis and show how the five papers fit into this framework and relate to the overall aim and to each other.
The rest of the comprehensive summary is structured as follows: Chapter 2 focuses on neighbourhood effects, providing a short introduction to the field together with a discussion about some theoretical issues. Themes I bring up are related to issues of globalisation, place dynamics, embeddedness and potential environmental determinism. In Chapter 3, I discuss residential mobility through brief reviews of theories related to mobility decisions and neighbourhood choice on the micro level and neighbourhood production and reproduction on the macro level. I also bring the two fields together by sketching a holistic framework (further elaborated in Paper I). In Chapter 4, I discuss methods and introduce the reader to the GeoSweden database. Chapter 5 summarises the five papers that constitute the thesis. Finally, in Chapter 6, I summarise the main conclusions from the thesis and present suggestions for future research.

The five papers are of both theoretical and empirical nature. They are written as independent papers with their own aims, perspectives, theories, methods and data, and these choices are made with the specific paper, not the entire thesis, in mind. However, all papers are related to the overall theme of the thesis. They offer different approaches to the problem, thereby complementing each other. As independent as they might be, together they form an argument for the holistic framework proposed in this thesis.

The papers can be read separately but a reader of the entire thesis is advised to follow the order they have been placed in. Papers I and II have the character of background papers, addressing methodological problems that residential mobility causes for the field of neighbourhood effect studies. Papers III and IV are empirical estimates of neighbourhood sorting whose results are intended to i) show that sorting is indeed happening and that selection is a real and serious problem and ii) increase our understanding of sorting processes. Finally, Paper V is an empirical study of neighbourhood effects and neighbourhood sorting jointly. The paper makes use of the holistic framework postulated and addresses (some of) the methodological challenges discussed in Papers I and II.
2. On neighbourhood effects

The number of neighbourhood effect studies has grown rapidly during the last two decades, attracting scholars from a wide range of disciplines and countries. U.S.-based researchers have been interested in neighbourhood effects and consequences of segregation for a long time. There are examples of studies exploring relationships between the collective – neighbourhoods, schools, friendship networks etc. – and outcomes such as criminal behaviour and achievement orientation that are more than fifty years old. A majority of the U.S.-based studies of neighbourhood effects are, however, fairly recent. Since the early 1990s, following the publication of William Julius Wilson’s seminal work *The Truly Disadvantaged* in 1987, U.S.-based scholars have produced a large quantity of studies estimating neighbourhood effects on outcomes such as income, employment, school performance, teenage pregnancies and sexual behaviour, criminal behaviour and health. Most studies have found evidence of non-trivial independent neighbourhood effects for residents in both affluent and disadvantaged areas, although much research has been directed towards poverty areas. The literature has been summarised in several comprehensive reviews: see, e.g., Leventhal and Brooks-Gunn, 2000; Pickett and Pearl, 2001; Sampson et al., 2002; DeLuca and Dayton, 2009; Harding et al., 2011; Newburger et al., (Eds.) 2011.

The interest in neighbourhood-related research has increased also in Europe over the last two decades. Empirical studies of neighbourhood effects have now been conducted in a large number of countries, such as England, Scotland, the Netherlands, France, Germany, Belgium, Finland, Norway and Sweden. The number of studies is, however, still smaller than in the U.S., and results vary between both countries and studies (see Friedrichs et al., 2003; Andersson, 2008). Many studies have found neighbourhood effects, but there are also several examples of studies that have found only extremely small or no neighbourhood effects (see, e.g., Brännström, 2004; Bolster et al., 2007; Kauppinen, 2007; van Ham and Manley, 2010).

The Swedish contribution to the field is relatively large, presumably because of the good access to high-quality longitudinal data in conjunction with an intensive debate on especially ethnic residential segregation from the early 1990s onwards. Most Swedish studies have found evidence of small neighbourhood effects. There is, for example, evidence that growing up in or living in a disadvantaged area has a negative effect on educational outcomes or socio-economic performance (E. Andersson, 2004; Musterd and R. An-
dersson, 2006; Galster et al., 2008; Urban, 2009; Musterd et al., forthcoming). Bergsten (2010) adds that children growing up in socially mixed neighbourhoods perform better compared to those from disadvantaged areas, and that neighbourhood income mix is more important than ethnic mix (see also Andersson et al., 2007; Urban, 2009). There are also several examples of studies looking at school effects rather than neighbourhood effects, i.e. how school segregation affects students’ grades (Andersson et al., 2010; Östh et al., 2010). According to Bergsten (2010), the school context is more important than the neighbourhood context for children’s school performances (for similar results from the Netherlands, see Sykes, 2011).

Despite the increasing number of studies that support the existence of (small) neighbourhood effects, scholars still struggle to convince critics that results are causal neighbourhood effects, not just correlations. The critique is based mostly on methodological aspects, especially the existence of potential selection bias (see Papers I and II). Other commonly mentioned methodological problems relate to the delimitation of neighbourhoods, how to identify causal mechanisms, and how to measure neighbourhood exposure (see Jencks and Mayer, 1990; Duncan et al., 1997; Pickett and Pearl, 2001; Galster, 2008).

However, it is likely that some of the critique of neighbourhood effect research also stems from more conceptual perspectives. In times of globalisation and individualisation, why do neighbourhoods matter? If neighbourhoods matter, to what extent do they determine the lives of individuals? And, as I ask in this thesis: if we understand people as mobile and neighbourhoods as dynamic, how can we understand and measure impacts of specific neighbourhoods?1

Understanding neighbourhoods

That neighbourhoods have received so much attention in both academic and policy debates lately might seem a bit strange, given the trends towards globalisation and individualisation. Back in the 1950s, Park had already noted that: “in the city environment the neighborhood tends to lose much of the significance which it possessed in simpler and more primitive forms of society” (Park 1952, p. 20). However, although Park and others may be right about the declining impact of neighbourhoods on people’s daily lives, scholars and practitioners seem to agree that the local scale is still important.

According to Forrest (2008), the renewed interest in neighbourhoods can be attributed to a number of processes. The first is a general concern about “the crisis of social cohesion” (Forrest, 2008, p. 131). Perhaps the best-

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1 There are also other problems that I do not address in this thesis, such as the normative nature of some studies.
known work on this theme is Putnam’s (2000) *Bowling Alone*, in which he argues that social capital in the contemporary U.S. is constantly declining, resulting in declining active civic engagement and participation in elections and a growing mistrust in politicians and governments. Second, Forrest (2008) identifies the two simultaneous trends of suburbanisation and ghettoisation of the inner cities (especially in the U.S., see Wilson, 1987) which have led to policies aimed at neighbourhood revitalisation. Third, Forrest (2008) highlights the parallel rise of globalism and localism in research. Geographers have repeatedly emphasised the need for knowledge about local conditions if we are to understand particular experiences in specific places (Johnston and Sidaway, 2004). Among the most influential researchers in this context is Massey (1984), who in her essay *Geography Matters* claims that general processes or structures have different outcomes in different areas, depending on the unique characteristics of these localities. According to Giddens (1979; 1984), it is not only responses to structural elements that vary across space but also structures themselves. While responding to structures, individuals also produce structures through their actions. Similar ideas are expressed by Soja (1980), who uses the term ‘socio-spatial dialectics’ to describe how spatial processes affect social patterns while social processes also affect spatial patterns.

Pred (1984a) has further emphasised the importance of time and space in producing structures in his attempt to merge structuration theory with time geography. According to Pred, structures are being produced and reproduced through the crossing of individual paths with institutional projects. A path is, in time-geographical language, the events and actions an individual undertakes during a specific period. Projects refer to tasks necessary to fulfil a goal. Time geography emphasises that both paths and (the ability to realise) projects are bounded by time and space, and limited by capability (biological limits), coupling (the need to adapt to the schedules of others) and authority (restricted access to certain spaces) (see Hägerstrand, 1982). Thus, the crossing of paths and projects, i.e. individuals’ thoughts and (re)actions in relation to institutional structures, and consequently the process of structuration is time-space specific. The structural environment is thus not only local but may also change over time. With its emphasis on time and space as limited resources, time geography provides an argument for why the local should matter for the everyday lives of individuals, despite globalisation. There is also plenty of scholarly work that shows that individuals maintain local social relations (e.g. Henning and Lieberg, 1996). Local social relations and time-space limitations are arguably especially important for children and youth, which is why many neighbourhood effect studies focus especially on these groups (e.g. DeLuca and Dayton, 2009; Bergsten, 2010; Andersson et al., 2010; Harding et al., 2011; Sykes, 2011. For a review of earlier studies of neighbourhood effects on children or adolescents, see Leventhal and Brooks-Gunn, 2000).
Discussions of what constitutes a neighbourhood or of what characteristics of place are important are surprisingly few in the neighbourhood effect literature. One definition of neighbourhood has been forwarded by Galster (2001, p. 2112), who defines neighbourhoods as: “bundle[s] of spatially based attributes associated with clusters of residences, sometimes in conjunction with other land uses”. This definition emphasises the importance of a variety of local features, including institutions, labour market opportunities, demographic and socio-economic characteristics of the neighbourhood population, various physical attributes, patterns of social interaction, and “sentimental characteristics”, such as place identification (ibid.). Thus, neighbourhoods are units that capture the physical allocation of various attributes across space and together create a mosaic of environments in which individuals reside (cf. Massey, 1984; Sykes, 2011).

One problem of defining neighbourhoods is that different neighbourhood attributes have their own spatial patterns. For example, social interaction with neighbours is often restricted to those living in the same block while local institutions often serve larger areas (cf. Suttles, 1972; Galster, 2001; Kearns and Parkinson, 2001). Opinions about how their neighbourhood is best defined also vary among residents (Lee and Campbell, 1997). In empirical studies, neighbourhoods are often defined according to administrative or other easily defined boundaries, and are varyingly set to be streets, blocks, census tracts, zip code areas, buildings located within a certain distance from the individual, or defined by some other empirical measure. According to Andersson and Musterd (2010), the spatial scale on which neighbourhoods are defined has effects for empirical results. Modelling effects on individuals’ social position, they find that neighbourhoods defined on a smaller scale provide stronger neighbourhood effects compared to larger-scale neighbourhoods. However, results may vary depending on outcome and hypothesised mechanisms.

Regardless of how neighbourhoods are defined, it is important to acknowledge that they constitute only one of many geographical scales that affect and shape the lives of individuals (as well as processes on other scales). The term ‘opportunity structure’ is commonly used in the neighbourhood effect literature to describe structures and conditions on various geographical scales that may affect individual opportunities (Galster and Killen, 1995; Briggs, 2005). Which levels constitute the opportunity structure differ between countries, depending on the constitutional and legislative setting. In Sweden, municipalities are responsible for most local public services and city planning, and thus directly affect the distribution and quality of dwellings, other buildings, and public services. It is, however, important to recognise that planning decisions as well as many other local decisions are affected by national policies. Several laws and regulations that can be assumed to directly affect the outcomes of individuals are also instituted at the national level. Other geographical levels that arguably could be part of the
opportunity structure in Sweden are counties and local regions. Recent extensive work in the social sciences also acknowledges the links between events at local levels and global processes. Decisions and policies on the world regional level (in the Swedish context equivalent to the European Union) and global processes and structures such as capitalism, global inequality patterns, global threats and migration flows from South to North affect laws, regulations, patterns and processes at lower scales, thus ultimately affecting conditions for individuals at the neighbourhood level (Briggs 2003; see also Musterd, 2005).

Structures, policies and attributes of all these levels together affect individual opportunities. However, they are not static but change over time. Some changes are substantial enough to significantly alter the daily paths and lives of individuals, exemplified by Pred’s (1984b) study of the Swedish enskifte (consolidation). Both Giddens (1979; 1984) and Pred (1984a) emphasise the dynamics of structure and place in their respective research, through ideas of dualism and constant reproduction of structures and the becoming of place. Pred discuss place in terms of a process: constantly reproduced, building upon existing conditions and individual responses to these, and where social reproduction, individual biographies (paths) and the transformation of nature occur simultaneously and constantly. Place, he argues, is a constantly ‘becoming’ human product that “[…] always involves an appropriation and transformation of space and nature that is inseparable from the reproduction and transformation of society in time and space” (Pred, 1984a, p. 1). Although it could be hypothesized that the reproduction of local structures to a large extent is precisely a reproduction (of existing structures) through (local) socialisation processes, individual paths and projects and consequently neighbourhood attributes that may affect individual opportunities are likely to change over time. Through their actions, individuals constantly modify their physical and social environment. They form and dissolve social relations. They build new or alter existing buildings. They vote for local politicians or protest against decisions. They choose daycare centres and schools for their children. They affect the population composition of their neighbourhoods by having children, becoming employed or – as is the theme of this thesis – by moving. Moreover, the mobility of individuals across space means that new individuals will respond to existing local structures and potentially reproduce the same. It also means that individuals change their own structural surroundings over time.

How neighbourhood effects operate

The opportunity structure, including the actual neighbourhood, sets the stage on which individuals operate. This setting may affect individual behaviour or attributes through a number of transmission mechanisms. Several scholars
have provided lists of these mechanisms, categorising them in slightly different ways (cf. Jencks and Mayer, 1990; Manski, 1993; Galster, forthcoming). For my purposes, a useful division is one that separates mechanisms that may affect inhabitants instantly from mechanisms that are more likely to require a certain amount of exposure time. Although effects generally can be hypothesised to get stronger with increased exposure, the latter group of mechanisms has an initial threshold before which any neighbourhood effects are unlikely.

Mechanisms that require some sort of social interaction between neighbours are likely to require a certain period of residency before coming into play, since it takes time to get to know one’s neighbours (see Briggs, 1998). Effects caused by such mechanisms would consequently be less likely to occur in neighbourhoods with high levels of mobility. Furthermore, the relative strength of these mechanisms on one individual can be hypothesised to be affected by the mobility of others. For example, the resources embedded in local social networks may change when individuals move in (if the networks expand) or out (if leaving the [local] network), and peer group pressure is likely dependent on a few key individuals. Among socio-interactive mechanisms are socialisation (into certain norms and behaviour), social control, resources (or the lack thereof) embedded in social networks, and competition.

Other types of mechanisms can be hypothesised to affect inhabitants immediately upon moving in. These ‘other’ mechanisms generally refer to access to or quality of various institutions or characteristics of the physical surroundings. Galster (forthcoming) separates between geographical, environmental and institutional mechanisms. Geographical mechanisms refer to the neighbourhood’s relative position in respect to markets and institutions of various qualities. For example, school ‘choice’ and ultimately grades are likely affected by both the quality of and accessibility to (including whether the student is allowed to enlist) the local school as well as quality of, possibilities of applying to, and distance to other, alternative schools. Environmental mechanisms refer to various aspects of the local physical and social environment that may affect individuals’ mental or physical health, such as the physical surroundings, exposure to violence and exposure to toxins. The last category is institutional mechanisms, which include quality of local institutions, prevalence, direction and quality of private market actors located in the area, and neighbourhood stigmatisation.

All these ‘other’ mechanisms are likely to affect individuals more or less instantly, although it may take time before any effect is seen. Effects may also work cumulatively, i.e. gain strength over time (see Musterd et al., forthcoming). For example, anyone who lives in a neighbourhood where there are toxins in the water will be exposed to these toxins more or less immediately but those who have lived there for a long time can be assumed to show stronger symptoms. Neither is the relative impact of these mechan-
isms related to the mobility of single individuals. They may, however, change if the entire population composition changes. For example, spatial mismatch may become less of a problem if the population changes in such a way that those whose education better matches the job opportunities in the local area increase in numbers, and neighbourhood stigmatisation may increase if a stigmatised group becomes more dominant.

Residential mobility is not, however, the only factor that may cause variation in the strength of effects from various mechanisms. Individual characteristics, experiences and circumstances will affect to what extent individuals are vulnerable to various characteristics of the opportunity structure and how they respond to various transmission mechanisms, likely resulting in what Harding and colleagues (2011, p. 1) term “effect heterogeneity”. For example, local job opportunities may be good for certain individuals or groups of people, due to their educational/job credentials or other features (including gender, ethnicity and similar grounds) but poor for others. Likewise, some institutions may be more accessible or important to certain groups than to others. The quality of local public transport is more important for those who do not have access to a car.

Environmental determinism?

If one accepts the neighbourhood effect hypothesis – that the spatial context affects individual outcomes through the spatial distribution of attributes on various relational geographic scales – the next question is: how strong is this effect? Does space affect or determine individual life chances?

One source of critique of neighbourhood effect research has been its potential connections to environmental determinism and ideas about ‘cultures of poverty’. The term ‘culture of poverty’ was originally developed by Oscar Lewis to describe a subculture characterised by marginalisation, powerlessness, dependency and alienation. According to Lewis (1968), these traits serve to keep the already marginalised in poverty, including their children, who are socialised into attitudes and behaviours that restrict their possibilities for future social mobility. Although Lewis’ studies on cultures of poverty are primarily based in Mexico, he argues that the theory can be transferred to the U.S., despite differences in the share of poor people and in the levels of inequality.

There are many similarities between neighbourhood effect theory and ideas about cultures of poverty. For example, both theories accept that ‘ghetto-like’ behaviour that is ‘deviant’ or negatively affects the life chances of individuals may arise in disadvantaged environments. There are, however, also some important differences. First, neighbourhood effect theory is not restricted to poverty areas. Wilson (1987) and others following him point out that internal neighbourhood processes take place in all neighbourhoods.
There are several examples of studies that (also) look at how outcomes are affected by the share of high-income earners (e.g. Chase-Lansdale et al., 1997): interestingly, some of those studies show that wealthy neighbours affect outcomes negatively (see Galster et al., 2008 and Paper V of this thesis). Additionally, there are examples of studies exploring the potentiality of social mix to reduce negative effects in the context of urban planning and policy (Galster, 2007; Bergsten, 2010; Sykes, 2011).

The key difference, however, according to Wilson (1987), is that whereas Lewis’ theory stresses that poor children learn the negative values and attitudes of their ‘culture’ at a very young age and then are unlikely to break free from these, Wilson’s own term ‘social isolation’ and the entire neighbourhood effect theory emphasises that behaviour and attitudes that affect outcomes are consequences of social organisation and structures at various geographical levels. While Lewis’ theory suggests that individuals who are socialised into cultures of poverty are trapped in poverty, neighbourhood effect theory emphasises that, although effects can be long-term (see Musterd et al., forthcoming), life opportunities can also change if the individual is subjected to less constraining environments. Behaviour can thus change, on the individual level by moving out of poverty areas (and thus facing a different opportunity structure), and on the societal level by changes in structures. It should be stressed, however, that where and when to move are decisions that are strongly conditioned by social and economic constraints.

The emphasis on structures in neighbourhood effect theory is also important. Although Lewis does acknowledge the impact of societal constraints, his theory is sometimes interpreted as one that more or less blames poverty on the behaviour and attitudes of those residing in poverty areas (Wilson, 1987). Neighbourhood effect theory, on the other hand, is built around the idea of structural constraints, including both structures that directly affect behaviour and structures that shape inequality across space. Neighbourhood effects can be interpreted as forces that further enforce inequalities already existing in society.

However, as I have argued in line with Giddens (1979;1984) and Pred (1984a), neighbourhoods and the structures that cause neighbourhood inequality should not be regarded as fixed. Instead, they are constantly changing, partly due to the mobility of individuals. A neighbourhood effect theory that acknowledges the dynamics of individuals, physically across space and socially between positions, but also of place and structure cannot be regarded as deterministic. It is in this sense that the connectedness of the two fields of mobility patterns and neighbourhood effects respectively, that I argue is essential, hopefully may contribute to a more contextualised understanding of neighbourhood effects.
I have already argued that neighbourhoods, places and structures should be regarded as dynamic. These dynamics can be studied from a range of perspectives and occur through many different processes, but I will in this thesis concentrate on one: residential mobility. Patterns of residential mobility have the power to substantially change the population composition of neighbourhoods and potentially also other neighbourhood attributes. Mobility patterns are generally the result of conscious decisions – people choose in which neighbourhood to live, even if there are differences in ability to choose. Thus, in order to understand flows of people between neighbourhoods, it is necessary to have some sense of the factors that cause households to move (or stay) and that affect their choices of destination neighbourhoods. For scholars interested in neighbourhood effects, these choices are not only important because of their impact upon the neighbourhood context hypothesized to affect individual outcomes: they are also key to understand one of the most serious methodological challenges facing the field: selection bias.

In this chapter, I briefly discuss processes of residential mobility on both the micro and the macro level. I then connect the theoretical discussion about residential mobility with neighbourhood effect theory by introducing and arguing for a holistic framework that includes both fields of research.

**Micro level: Moving individuals and choices on the housing market**

The mobility decision is often theoretically divided into two separate decisions: the choice to move and the choice of destination (see Brown and Moore, 1970). and furthermore divided into studies looking at the role of the dwelling and studies focusing on neighbourhoods. These divisions are, of course, arbitrary. People are likely to have ideas about where to move when deciding to move and vice versa, and their choices of dwellings are most probably affected by where these dwellings are located spatially (for an attempt to model these three decisions together, see Clark and Onaka, 1985). All three decisions are selective in character and may result in selection bias problems, inasmuch as the tendency to make these decisions varies among groups, depending on their current housing and neighbourhood situation. In
this thesis I have chosen to focus especially on the choice of neighbourhood. However, all three choices are often discussed as the result of a combination of household preferences, available resources and potential constraints (van Kempen and Özyürek, 1998; Özyürek and van Kempen, 2002).

Preferences, here also including needs, can be defined as “actual transformations of general goals people have in certain periods of their lives” (Özyürek and van Kempen, 2002, p. 368, with reference to Mulder, 1993). These preferences may cover both housing and neighbourhood. Although most previous research has focused on dwelling characteristics, such as size, price and standard (see, e.g., Clark and Dieleman, 1996), there is empirical evidence that changes of neighbourhood are not due solely to preferences for changing dwelling (Clark et al., 2006). There are numerous examples of residential mobility studies based on survey or interview data where respondents have been asked to report how important various dwelling or neighbourhood characteristics are to them, how they value their current dwelling and/or neighbourhood, and to what extent their mobility decisions reflect their preferences. Obviously, there are differences between both countries and individuals but there are also many similarities in results.

In their now forty-year-old review of the literature on destination choice, Brown and Moore (1970) identify five categories of factors that may affect households’ choice of neighbourhood: accessibility (to city centre, communications, service, green areas etc.), physical characteristics of the neighbourhood (material condition of street and sidewalk, layout, beauty), services and facilities (quality and accessibility), social environment (socio-economic, ethnic and demographic composition, friends and friendliness), and individual site and dwelling characteristics (costs, housing size etc.). These categories seem to be still relevant, also in Sweden, based on the results of several recent surveys (Fransson and Magnusson, 2000; Fransson et al., 2002; see also Paper II). Despite their differences in research area and target population, these studies all find that neighbourhood characteristics such as safety, visual beauty, public transport and access to green areas are rated among the most important factors when choosing neighbourhood, although Fransson, Rosenqvist and Turner emphasise that there are differences between groups of people depending on both individual characteristics and type of municipality. Geographical location is also generally perceived as important, where the most popular areas generally are those in or near the city centre and those near water (Fransson and Magnusson, 2000; Fransson et al., 2002).

Lee, Oropresa and Kanan (1994) include both subjective and objective neighbourhood characteristics in their study of how the neighbourhood context affects planned and actual mobility among a sample of respondents in Nashville, U.S. They find that neither subjective nor objective neighbourhood variables have much effect on actual mobility, but that mobility thoughts are affected by respondents’ subjective rating of the neighbour-
hood, whether they thought they would miss it if moving, whether they thought that the neighbourhood would improve, and by the actual mobility rate (see also Feijten and van Ham, 2009). Other scholars have looked more deeply into the effect of a changing environment. According to results by Feijten and van Ham (2009; van Ham and Feijten, 2008; see also van Ham and Clark, 2009), changes in ethnic composition especially trigger out-mobility intentions. Ethnic composition has generally received much scholarly attention lately, especially in U.S.-based research (see, e.g., Clark, 2002; Zubrinsky Charles, 2000). Others have found that changes in socio-economic status are important (see Harris, 1999). Permentier, van Ham and Bolt (2009) have furthermore argued that changes in neighbourhood reputation alone could affect rates of out-mobility.

Not all individuals, however, have the opportunity to transform their preferences into reality. (Lack of) available resources may constrain people from moving, or from moving to certain neighbourhoods, but they may also steer households in certain directions. Resources can be divided into financial resources, cognitive resources, social resources and political resources (van Kempen and Özüekren, 1998; Özüekren and van Kempen, 2002). Financial resources include income and assets, given a household’s expenditure, and also eligibility for a bank loan. Cognitive resources refer to knowledge, both education in general, which often affects financial resources, and specific knowledge about the local housing market and its various institutions. This encompasses knowledge about different neighbourhoods within a city, including, e.g., location, composition of dwellings, and status/reputation of the local school (as in the introductory example). Social resources, or social capital, refer to the resources embedded in social networks. Social resources can affect moves directly, e.g. as shown in Paper IV where family is found to be a component that attracts people to neighbourhoods. They can also affect mobility via other resources, e.g. by financial assistance or by sharing information about the local housing market. Finally, political resources refer to a person’s rights in the housing market and more generally in society.

Limited access to resources can restrict a household’s opportunities in the housing market, but there are also other types of constraints. Discrimination is often mentioned in the residential mobility literature, although the number of empirical studies is relatively small. Most focus has been given to ethnic discrimination (see, e.g., Robinson, 2002, for the U.K.; Ross, 2011, for the U.S.; Molina, 2010, for Sweden) but there are also other groups that possibly could be subject to discriminatory practices, such as young adults or disabled people.

Preferences, available resources and potentially also other restrictions vary over the life course, and so does the likelihood of moving in general (Clark and Dieleman, 1996). It is, for example, well known that mobility is closely associated with age and family composition, and that young adults
and single households are more mobile than others. Mobility is also associated with life course events, such as finding a partner, having a child, getting a job, or divorce (e.g. Clark et al., 2003; Clark and Huang, 2003; see also Mulder and Lauster, 2010, for a recent review). Preferences, available resources and constraints can also vary across other groups. For example, some scholars have suggested that the specific mobility patterns of minority ethnic groups can be explained by cultural differences in preferences while others argue that such differences are more likely to be due to differences in available resources and other types of restrictions (for an overview, see Özüekren and van Kempen, 2002).

**Macro level: Neighbourhoods shaped and reshaped**

The constant flow of people between neighbourhoods obviously has an effect on the population composition of each area. It can lead to rapid changes in population composition, if the composition of movers is substantially different from the composition of inhabitants. Population flows can also reproduce neighbourhood characteristics over time (see Paper II). If no migration were to take place, the population composition of neighbourhoods would nevertheless change in accordance with other demographic events (births, deaths, ageing) and the social mobility of the inhabitants. Selective migration patterns prevent changes in population composition when, for example, those who have children move out of an area inhabited mainly by young adults and are replaced by younger households. The production and reproduction of neighbourhoods’ population composition could potentially also be linked to other traits, such as the allocation of resources, neighbourhood reputation and status, planning activities, patterns of social interaction, or levels of noise and violence. Flows of people between neighbourhoods thus shape and reshape patterns of residential segregation.

A large number of studies have looked into residential segregation and how it is produced and reproduced by selective mobility patterns. Especially ethnic residential segregation has received the attention of researchers. When discussing how selective mobility patterns affect neighbourhood characteristics, I therefore use ethnic segregation as an illustration, but much of the discussion can be applied also to other forms of segregation.

In a conceptual model of the production and reproduction of immigrant-dense neighbourhoods in Sweden, Andersson and Molina (1996; see also Andersson, 1998; Bråmå, 2006b) identify four types of migration: segregation-generating migration, segregation-generated migration, institutionally generated migration and network-generated migration. These four types of migration are by no means exclusive but should be seen as complementary and interrelated explanations of the dynamic processes that lead to ethnic segregation. The focus on processes rather than static figures suggests that
residential segregation is something dynamic, where levels are changed or reproduced by constant flows of people.

*Segregation-generating migration* refers to mobility processes that lead up to (ethnic) residential segregation. An example is when members of an ethnic minority move into areas and dwellings previously inhabited by members of the majority, thereby increasing the share of minorities in that neighbourhood. Such flows may be the results of changing migration patterns into the country (i.e. changes in population composition) but also of changing migration patterns between cities and neighbourhoods.

*Segregation-generated migration* refers to migration patterns that are caused by, in this example, ethnic segregation and the high or increasing levels of minorities in certain areas. Such migration patterns may thus be the result of attitudes towards immigrants or countrymen but also towards other neighbourhood characteristics that people associate with certain types of population composition (poor services, crime, general poverty, bad reputation etc.). Two complementary theories of segregation-generated migration that emerged in the U.S. but has been tested also in a European context are ‘white flight’ and ‘white avoidance’ (see Ellen, 2000). According to white flight theory, the majority population (or other population groups) begin to leave a neighbourhood when the share of minorities exceeds a certain threshold, whether due to a general unwillingness to live among minority members or to secondary changes in, for example, the school environment. White avoidance theory suggests that majority members also avoid moving into areas where the share of minorities is perceived as ‘too high’.

In his seminal papers, Schelling (1969; 1971) demonstrated via simulation technique that even small differences in (ethnic) preferences between two population groups can result in high levels of (ethnic) segregation, via adjusted, ethnically selective mobility. The white flight and white avoidance theories have also gained support from empirical studies that either model actual mobility patterns or explore ethnic preferences (e.g. Crowder 2000; Bråmå, 2006a; Bolt et al., 2008; Card et al., 2008; Pais et al., 2009).

The third category, *institutionally generated migration*, highlights the influence by various housing market institutions on migration flows. For example, housing decisions are directly influenced by the structure of the housing market, tax levels related to housing, housing allowances or other forms of subsidies, and various rules and regulations. They are also affected by institutions that are not directly related to housing but nevertheless affect the scope of households in making housing decisions, including the labour market, financial institutions, and economic and welfare policies. From an ethnic segregation perspective, immigration policy is also relevant, affecting the absolute number of immigrants and potentially also where they settle down.

Finally, according to Andersson and Molina (1996), ethnic segregation is affected by *network-generated migration*. Ethnic minorities may want to live near co-ethnics (especially upon arrival), majority members may want to move
near family and friends, and social networks influence people’s knowledge and opinions about different neighbourhoods in a city (see Paper IV).

These four migration processes show how (ethnic) segregation patterns may originate and then become reshaped or even enhanced through continued patterns of selective migration, resulting from the mobility choices made by households.

A holistic framework

Residential mobility is not by any means an unknown or ignored concept in the neighbourhood effect literature but has in fact been acknowledged by a large number of studies. Some studies point to problems related to exposure time or to the effect mobility itself can have on various outcomes, and they address these issues by incorporating some kind of measurement of mobility, such as years in neighbourhood, years since last move, or total number of moves over a time period (e.g. Vartanian and Gleason, 1999; Galster et al., 2007), or alternatively confine their sample to non-movers (e.g. Dawkins et al., 2005; Bergsten, 2010). Most recent studies address selection bias but some studies also engage in discussions or explanations of how this bias and/or endogeneity bias occurs through mobility and try to correct for it through one of various available techniques. For example, the problem of simultaneity (endogeneity) is much discussed in the spatial mismatch literature where the choice of residential relocation may affect employment or earnings, via accessibility, but may also be affected by earnings/employment status. Someone who is employed may, for example, choose housing in a low-price area despite poor access to jobs (see Ihlanfeldt, 1992). One strategy in tackling this problem has been to focus on youth who still live with their parents and thus not make their own mobility decisions (Ihlanfeldt and Sjoquist, 1998).

Especially interesting from my perspective are studies making use of existing policies or programs related to residential mobility (e.g. Åslund and Fredriksson, 2009; van Ham and Manley, 2010). This type of study has been especially common in the U.S., where several mobility programs have been launched to combat ethnic segregation and assist people to move out of poverty or ‘black’ neighbourhoods to ‘escape’ negative neighbourhood effects (see DeLuca and Dayton, 2009). The Moving to Opportunity program (MTO) is often described as the prime example of this, partly constructed by scholars and launched not only as a mobility program but also as a ‘natural experiment’ designed to overcome selection bias through a random distribution of housing vouchers aimed to assist households to leave poverty areas (for a description of the MTO program design, see Gennetian et al., 2011).

The mobility programs and the related neighbourhood effect studies not only suggest that mobility really is an integral part of neighbourhood effect
theory but experiences from these programs also highlight how mobility can cause problems for neighbourhood effect research. For example, experiences from the Yonkers program in New York (see Briggs, 1998) showed that many movers still had access to their ‘old’ networks after the move, making it difficult to distinguish effects from different neighbourhoods (Briggs, 1997). Studies controlling for selection by making use of the Swedish *Hela Sverige-strategin* (Whole of Sweden strategy), a national refugee dispersal policy implemented between 1985 and 1994, have instead struggled with high rates of onward migration (see Åslund and Fredriksson, 2009). The studies using MTO data have been criticised for not having sufficient exposure time to be able to estimate effects, and for insufficient change in higherscale structural elements to compare effects from two different environments (Sampson et al., 2002; Clampet-Lundquist and Massey, 2008; Sampson, 2008).

But if residential mobility already is acknowledged in neighbourhood effect research, what is the point of this thesis? The problem is in my view that although most recent research do attempt to correct for one or two of the problems associated with residential mobility (commonly selection bias), few, if any, studies acknowledge them all. One possible explanation is that residential mobility is, with some exceptions, rarely incorporated in the theoretical frameworks of neighbourhood effect studies, and when it is discussed, it is in terms of something that affects levels of residential segregation and consequently characteristics of specific neighbourhoods but not as something that directly affects estimates of the effects of segregation, i.e., neighbourhood effects (see Figure 1). The two fields are thus separated from each other, both theoretically and methodologically. An illustrative example is a special issue of *Housing Studies* (volume 18(6), 2003) that includes studies of both selective mobility processes and neighbourhood effects but in which none of the papers studies them together. The papers were furthermore divided into residential mobility papers and neighbourhood effect papers.
In my view, the one-way relationship illustrated in Figure 1 does not provide a correct image of the complex web of relationships between the two fields of residential mobility and neighbourhood effect research. Not only do I find it rather obvious that issues like the amount of time one has lived in a particular neighbourhood affect estimates of neighbourhood effects: the actual attempts that have been made to control for various methodological problems related to mobility in neighbourhood effect research also serves to prove this point. However, since different neighbourhood effect studies address different methodological problems related to mobility (by, for example, controlling for the total number of moves or work with a sample of non-movers), the picture of interrelatedness between the fields of residential mobility and neighbourhood effect research is quite fragmented.

In Figure 2, I illustrate the complex web of relationship that combines the two fields of literature (alternative conceptual models have been suggested by Galster, 2003; Doff, 2010). I argue that the one-way relationship presented in Figure 1 is in fact a two-way relationship, where neighbourhood effects affect patterns of segregation and mobility, just as residential mobility affect neighbourhood effects. This idea is linked to theories of socio-spatial dynamics: spatial patterns (i.e. residential segregation or the characteristics of specific neighbourhoods) affect societal processes (i.e. neighbourhood effect processes or processes of mobility) but societal processes also affect spatial patterns. I furthermore argue that the two fields are directly related to one another, i.e. that there are direct causal linkages between residential mobility patterns and neighbourhood effects and vice versa. Figure 2, and the discussion of interrelatedness between the two fields, is further developed in Paper I, where it also includes a time aspect that stresses the need for a better understanding of neighbourhood dynamics over time.
Figure 2 suggests that the two fields of residential mobility and neighbourhood effects are connected by two different kinds of relationship: one two-way relationship that operates through the neighbourhood (arrows a and b), and one two-way relationship that goes directly between mobility and neighbourhood effects (arrows c and d). The links going from mobility to neighbourhood to neighbourhood effects (arrow a) illustrate the main arguments in residential mobility research in relation to residential segregation and in neighbourhood effect research, respectively. Mobility patterns affect the composition of people (and other things) in neighbourhoods, and neighbourhood characteristics have a causal effect on individual behaviour and outcomes. The opposite relationship (represented by arrows b, Figure 2) is supported by theoretical ideas and empirical results in both fields. The foundational theory of neighbourhood effect research is that individual opportunities, ideas and behaviour are affected by their neighbourhood environment. Consequently, the aggregate population composition of neighbourhoods (including the behaviour of the population) and associated changes in other neighbourhood attributes (for example, the physical structure or patterns of social interaction) are affected by neighbourhood effects. Actual or anticipated neighbourhood effects may also affect neighbourhood characteristics by attracting or repelling firms, institutions, public funding etc. The literature suggesting that neighbourhood factors have an independent effect on people’s tendencies to move or stay has shown that such changes, actual or anticipated, (may) affect mobility patterns.

In Figure 2, I also suggest that there is a direct two-way relationship between residential mobility and neighbourhood effects. As argued by Sampson and colleagues (Sampson and Groves, 1989; Sampson et al., 2002), high mobility rates may disrupt social norms and thus affect the mechanisms be-
hind neighbourhood effects. Mobility also affects behaviour, for example home maintenance behaviour (Galster, 1987). Such behavioural changes can be mistaken for neighbourhood effects (when in fact they are caused by mobility or mobility plans) but they may also affect the behaviour of others (e.g. through socialisation processes), thereby resulting in a neighbourhood effect. These relationships are represented by arrow c.

The opposite relationship (arrow d) represents the possibility that mobility choices and aggregate mobility patterns are affected by neighbourhood effect mechanisms. For example, social processes in the neighbourhood could affect mobility decisions as well as other behaviours, making people more or less mobile compared to if they had lived elsewhere.

There are further conclusions to be drawn from a holistic framework. I especially wish to stress ideas related to neighbourhood dynamics (this argument is made clearer by the more developed figure in Paper I). If one leaves out mobility, residential segregation is easily reduced to static levels of neighbourhood inequality. As has been discussed, it is fair to assume that most neighbourhoods have their characteristics reproduced and their relative status maintained over time. Thus, it is probable that a poverty neighbourhood at time A will be a poverty neighbourhood also at time B (times A and B being the start and the end of the necessary period of exposure). However, as previously argued, this reproduction does not mean that neighbourhoods are static. The reproduction of neighbourhood population compositions and associated attributes is due to constant in- and out-flows of people. These individuals will in turn reproduce or alter structures and place characteristics, while having their thoughts and actions affected by the same, perhaps in a similar way as the former residents. All neighbourhoods experience in- and out-mobility of their residents and some neighbourhoods are extremely dynamic. This is often especially true for the disadvantaged neighbourhoods that so often are in the focus of neighbourhood effect research (especially in the U.S.). The theoretical discussions and methodological problems related to dynamic neighbourhoods and mobile individuals thus especially apply to the neighbourhoods that are studied most extensively.
4. Data and methods

The field of residential mobility is both longstanding and broad enough to encompass studies with very different methodologies and methods. Roughly speaking, quantitative studies have been used to describe and analyse aggregate patterns, flows and factors related to different mobility behaviours. Studies using qualitative methods have complemented these by including narratives, contexts and a deeper understanding of the mechanisms behind various mobility-related decisions. Unlike residential mobility studies, the field of neighbourhood effects is more or less homogenous method-wise. A vast majority of the constantly growing number of studies employs different quantitative methods. Data are generally large-scale, whether encompassing entire populations, survey subsamples, or those involved in different kinds of natural experiments. Thus, most discussions about methods and future challenges in this field take quantitative studies as their starting point (e.g. Duncan et al., 1997; Galster, 2008).

The studies that make up this thesis also adopt quantitative techniques or discuss methodological problems from a quantitative standpoint. The quantitative techniques employed in the thesis are numerous: descriptive statistics of mobility patterns, probit regressions, conditional logit models to explore neighbourhood choice, and fixed-effects models with and without instrumental variables to estimate neighbourhood effects and neighbourhood sorting. The choice of method in each respective paper is based on the research questions of that specific paper. The papers have thus developed methodologically as independent pieces rather than as parts of a methodological whole. Although the thesis as a result may appear a bit fragmented, the advantage of this approach is that I am confident that in each paper I have used the best method for that particular study. The methods are described and motivated in each respective paper and I will therefore not spend time discussing them here. Instead, this method section will be devoted to things that are common to all papers: the database from which I have collected the empirical material, and the operational definitions of central concepts.
The GeoSweden database

All empirical papers in the thesis make use of data from the GeoSweden database. It is a longitudinal set of data that contains information about all individuals who have resided in Sweden 1990-2008. The data are collected from various public registers and put together by Statistics Sweden. Each individual is assigned a unique identifier number which is used to link data from the different registers to individuals and access detailed demographic, socio-economic and geographic information. The demographic information encompasses data such as sex, year of birth, household composition, position in the household, number of children, citizenship, and country of birth for both the individual and his or her parents. Socio-economic data include level and type of education, employment status, workplace, income from work and different types of transfer payments, among other things. The low-scale geographic information consists of geocoordinates and SAMS (Small Area Market Statistics) areas. Furthermore, GeoSweden also contains information about migration events, deaths, educational achievements, and housing. Most data are collected on an annual basis. This means that changes in, for example, socio-economic status or residential location can be tracked over time. Housing data are collected for 1990, 1995, and every second year during 2000-2008.

The housing data are one of the main weaknesses of GeoSweden. Unfortunately, it is not related to dwellings but to real estate units (Swedish: fastighet). A real estate unit can consist of one or several buildings, single dwellings or a multi-family housing. In other words, there is no information about separate dwellings, unless the dwelling is a unique real estate unit. This results in a lack of data on dwelling characteristics that are important for mobility decisions, such as price, size and standard of dwellings in multi-family buildings.

Another main weakness is the lack of data on households. GeoSweden consists of compilations of individually-based register data. Thus, it can define households with couples only if the couples are registered, i.e. married/registered partners, or have a child in common. Households with couples can also be identified based on residential address, as long as their real estate unit consists of a single home. Cohabitants residing in multi-family housing cannot be identified as couple households but are identified as two single-person households. This means that the number of single-person households is overestimated. This might be especially problematic in Sweden, where cohabitation is a common form of partnership, especially in younger age groups.

The database was updated with data for 2007 and 2008 during spring 2010. The subsets for the empirical papers had already been created by then, which is why they contain data only up to 2006.
As in all databases, there are likely to be some register errors in the data. One problem in studies of mobility and residential location is that, for various reasons, some people do not register at their correct address, and thus will be allocated to the wrong neighbourhood (or even city) in the empirical studies. This problem is likely quite small in the general population but can be substantial in specific sub-groups, especially students and young adults. Information about demography and socio-economic status is automatically collected by the authorities and is thus more reliable, with the exception of, for example, income from the black market. Individuals who are not registered in Sweden are not included in the database.

These problems are, of course, unfortunate but the data in GeoSweden is still of very high quality in an international perspective and very well suited for studies of both mobility and neighbourhood effects, since it covers the total population over a long period of time and contains a large number of variables, including relatively precise geographical information. It has been used in several previous Swedish studies of both fields. (e.g. R. Andersson, 1998; E. Andersson, 2004; Bråmå, 2006a; b; R. Andersson et al., 2007; Galster et al., 2008; Bergsten, 2010)

Operational definitions of central concepts

Working with quantitative methods means having to put people and places into categories. Categorisations are often problematic: they could always have been made differently, and how they are made directly affects the empirical results. In the following sections, I will discuss how I have chosen to deal with the most central categories in this thesis. These include the operational definitions of neighbourhoods, moves, a moving unit, and finally a few words about immigrants.

Neighbourhood

Geographical space is a continuous variable that by necessity must be classified into demarcated areas in empirical quantitative studies of neighbourhood choice or neighbourhood effects. GeoSweden allows for several different alternative classifications of neighbourhoods, including already existing areas on different scales and the ability to create one’s own neighbourhood definitions based on geocoordinates. These alternatives all have their associated advantages and disadvantages. In this thesis, I have chosen to work with one of the existing divisions: SAMS units. SAMS is an administrative division constructed by each municipality in collaboration with Statistics Sweden. The SAMS division is based on homogeneity in terms of function, in residential areas with respect to the housing stock, resulting in relatively small and homogeneous areas. In urban areas, the division is mostly based
on an older neighbourhood division (NYKO, nyckelkodsområden) constructed by the municipalities to help them in their planning processes. Thus, the division is made with respect to physical structure and barriers and to the organisation of different forms of services (such as schools, healthcare units etc.). These characteristics make the SAMS areas appropriate as neighbourhood areas in neighbourhood choice studies, since they often correspond quite well to people’s ideas about neighbourhoods, and thus are likely to affect their choices on the housing market. Due to their relatively small size and relatedness to the planning process, they are also well suited for studies of neighbourhood effects, at least in studies hypothesising that geographical, environmental or institutional mechanisms are likely to occur. Studies looking at/hypothesising socio-interactive mechanisms would perhaps benefit from a lower-scale neighbourhood division. SAMS areas have often been used in previous Swedish studies of neighbourhood sorting (Andersson, 1998; Bråmå 2006a; b) and neighbourhood effects (E. Andersson, 2004; R. Andersson et al., 2007; Galster et al., 2008).

All empirical papers in this thesis make use of SAMS areas in one way or another. However, there are still large differences between the areas classified as ‘neighbourhoods’ in the respective papers. The size of SAMS areas differs between cities, both in terms of physical size and the mean number of inhabitants, making comparisons between cities difficult. The reader should be aware that the Stockholm SAMS areas, used in Papers II and V, are much larger than their Uppsala counterparts, used in Paper III. Whereas the mean SAMS area in Uppsala has about 900 inhabitants, the equivalent number for the Stockholm SAMS is about 4,300 inhabitants. In Paper IV, the area division is based on ‘urban districts’, aggregates of the Uppsala SAMS areas (roughly similar in size to the Stockholm SAMS areas). For this particular study, its aims and data, I found the Uppsala SAMS too small and homogeneous in terms of tenure, since the possibility of moving near a family member is directly related to the existence of (vacancies in) the preferred form of tenure. These differences between papers make it necessary to warrant caution when comparing results of the different studies.

Move

Both SAMS areas and geocoordinates, provided for each 100 * 100 metres, are measured each year. This makes it possible to track movers over time if they have moved at least 100 metres or across a SAMS border. Individuals who have moved shorter distances, for example within the same building, cannot be identified in the database. Furthermore, as estimates are annual, I can only identify one move each year. This means that the total number of moves is slightly underestimated, especially among the most mobile groups.

The general definition of a move in this thesis is that it involves a change in geocoordinates between two consecutive years. I include only individuals
who have geographical data for both years (i.e. recent immigrants and emigrants are excluded). Since the focus in the thesis is on intra-urban mobility, I have furthermore restricted the samples to those moving within their respective city. Depending on the geographical scale and research question(s) of each respective paper, the number of movers included in the sample may be further restricted. For example, the dataset used in Paper IV includes only individuals who have moved between neighbourhoods.

Moving unit
In residential mobility studies, two types of moving units are commonly used: individuals and households. Households are generally preferred since mobility decisions are made in the context of the household. However, households are difficult to identify in GeoSweden due to the structure of the database.

To use GeoSweden for mobility studies means having to choose between two poor definitions of a moving unit. My strategy has been to choose unit of analysis based on research question and practicality, resulting in one paper using households as the unit of analysis and three papers using individuals. To have two different operationalisations of a moving unit in the same thesis may be a bit unusual and also problematic. One could argue that this makes it difficult to compare conclusions from the different papers and that it blurs the ‘big picture’. I would argue, however, that it also provides stability to the results: regardless of whether one has individuals or households as the basic unit, results still show clear evidence of selective mobility patterns, especially with regard to income.

Immigrant
Finally, I would like to say a few words about the categorisation of immigrants since it has received much attention in the Swedish debate. The immigrant category is problematic for many reasons. First, the word ‘immigrant’ has one lexical meaning – someone who has immigrated – and another meaning in colloquial Swedish, whereby people from especially Africa and the Middle East are perceived as being ‘more immigrant’ (with a negative undertone) than someone from, for example, Norway or the United Kingdom (Myrberg, 2010). Furthermore, ‘immigrant’ may refer to the first, second and even third generation. Second, some scholars argue that a categorisation of ‘immigrants’ versus ‘natives’ produces an arbitrary divide into ‘us’ (native Swedes) and ‘them’ (immigrants), reinforcing the idea of two homogeneous but inherently different groups (e.g. Mattsson, 2000). Third, there is a more practical problem. Since GeoSweden lacks information on ethnicity, classifications are made based on country of birth and these are sometimes misleading (for example, Kurds are often classified as Turks).
Country classifications are not a problem in this thesis since I use different tools: I work with either a native/immigrant dichotomy or a native/Western immigrant (OECD countries)/non-Western immigrant categorisation, depending on the paper and the number of categories that it is reasonable to include. Only foreign-born individuals are defined as immigrants, while children of immigrants are defined as natives. However, all other problems associated with the classification of immigrants do apply to this study and it is important to be aware of these. Yet, I argue that although categories are problematic, studies like the ones I have done would be even more problematic if variables related to immigrant status or ethnicity were completely excluded.
5. The papers

The five papers that constitute this thesis together provide an argument why residential mobility should be incorporated into neighbourhood effect research, and make suggestions for how this can be done. This argument is put forward by a combination of theoretical and empirical papers. Paper I is theoretical. It could be seen as a complement to this introduction, forming the argument for the need to incorporate the two fields into one framework. Intended as a contribution to the debate on the credibility of neighbourhood effect research and the methodological problems facing the field, the paper also lists four methodological challenges that residential mobility raises. The second paper focuses on one of these challenges, selection bias, and provides a complementary and more detailed argument for the reason why residential mobility and neighbourhood sorting constitute such a problem for neighbourhood effect research. The argument is supported by empirical analyses of moving patterns and results from a survey.

Papers III and IV look into neighbourhood sorting. The aim of Paper III is to estimate the relative impact of different neighbourhood characteristics on the neighbourhood selection of various population groups. Paper IV introduces yet another neighbourhood characteristic, namely the location of (extended) family members. Both these papers are intended primarily as contributions to the residential mobility literature, aiming to explore more deeply how processes of neighbourhood selection work. The fifth and final paper of the thesis represents an attempt to bring the thesis together empirically. The aim of the paper is to estimate both neighbourhood effects and neighbourhood sorting simultaneously, controlling for both selection and endogeneity bias.

Paper I: The impact of residential mobility on measurements of neighbourhood effects

The first paper provides a conceptual overview of the fields of residential mobility and neighbourhood effects respectively and argues that studies of neighbourhood effects need to take mobility into account in order to avoid estimation problems. Its main contribution to the field is the development of a holistic framework. This framework is similar to the one presented in this
introduction, and therefore I will not discuss it further here, but the patterns and processes are discussed in more detail and time is added to the model.

Based on this framework, I identify four methodological challenges facing the field of neighbourhood effect studies that are directly related to residential mobility. These challenges are: exposure time, neighbourhood change, selection bias and endogeneity bias. Exposure time needs to be measured since some transmission mechanisms require a minimum time of neighbourhood exposure before they come into play. Exposure time must also be estimated in relation to neighbourhood change since the fact that an individual has resided in a specific neighbourhood a certain period of time does not necessarily mean that he or she has been exposed to, for example, a certain level of poverty this entire time. Most neighbourhood characteristics are however reproduced by selective mobility patterns, but even if they are, the composition of individuals will change due to mobility, which may have consequences for mechanisms related to social interaction. The third and fourth challenges, selection bias and endogeneity bias, have also been discussed in the introduction of this comprehensive summary. In brief, the outcome variable in the neighbourhood effect equation may be biased if it is correlated with unmeasured variables that also affect neighbourhood choice, or if processes of mutual causality make it difficult to disentangle the effect that is due to the neighbourhood.

In the paper, I discuss how previous studies have dealt with these challenges, where they have failed, and what this means for the reliability of estimates. I argue that in order to be able to control for processes of mobility and thus meet the identified challenges, longitudinal data is needed. Studies that work with cross-sectional data or that for other reasons fail to meet the challenges caused by mobility risk erroneous results.

Paper II: Understanding neighbourhood effects: selection bias and residential mobility

The second paper is co-authored with Maarten van Ham (OTB, Delft University of Technology3). It digs deeper into one of the problems identified in Paper I: selection bias. Using descriptive statistics over the period 1994-2008, we show how the shares of foreign-born and employed individuals have changed over time in three Stockholm neighbourhoods: one neighbourhood characterised by ethnic plurality and relative poverty (Rinkeby), one neighbourhood characterised by ethnic homogeneity (i.e. a high share of native Swedes) and relative wealth (Ångbylunden), and one area that has experienced a dramatic change in especially its share of ethnic minorities.

3 At the time of writing, Maarten van Ham worked at the Centre for Housing Studies/School of Geography and Geosciences, University of St Andrews.
over the period of measurement (Bjursätra). We then connect these patterns to migration patterns to and from these neighbourhoods, arguing that much of the change in or reproduction of existing patterns can be explained by selective mobility, especially in neighbourhoods that have experienced a high turnover rate.

The paper continues by arguing that these selective mobility patterns likely are connected to the problem of selection bias in neighbourhood effect research. It is unlikely that individuals choose destination only based on ethnicity and/or employment status of others, so we argue that the clear mobility patterns to and from the three neighbourhoods are likely connected to other, unmeasured, characteristics. To give an idea of which these unmeasured characteristics might be, we provide a brief review of the literature of neighbourhood choice. We also report results from a recent survey among ‘movers’ and ‘stayers’ in Uppsala where respondents stated that the factors most important to them were neighbourhood safety, access to green areas, cleanliness and visual beauty. If these unmeasured characteristics also are correlated with the outcome variable in neighbourhood effect studies, they will produce selection bias.

We argue for a need of more studies that look into neighbourhood choice processes and try to uncover more neighbourhood characteristics that affect such decisions and the relative impact of these. Such studies are a necessity if we are to understand the processes behind selection bias and ultimately, the neighbourhood context itself, and obtain unbiased effects of living in those neighbourhoods. We especially argue that both residential mobility and neighbourhood effect research would benefit from more studies that attempt to control for selection bias in neighbourhood effect studies by actually modelling mobility, something very few studies has attempted. We suggest that this could be accomplished via the Heckman two-step model.

Paper III: Neighbourhood choice and neighbourhood reproduction

The third paper deals with neighbourhood sorting. It is another co-production with Maarten van Ham, and also with David Manley (Department of Geographical Sciences, University of Bristol4). The aim of the paper is to look into how different types of household – ethnic minorities, households with children, low-income earners, public renters etc. – move to neighbourhoods of different kinds, and how these processes of sorting on the housing market relate to each other.

4 At the time of writing, David Manley worked at the Centre for Housing Studies/School of Geography and Geosciences, University of St Andrews.
The paper employs a model rarely used in studies of neighbourhood choice or selective mobility: a conditional logit model. The main advantages with this model over other, more commonly used methods are that i) we can model sorting as a choice between a large number of neighbourhoods and ii) we can test the impact of several neighbourhood characteristics simultaneously. In other words, where most previous studies that estimate neighbourhood selection focus on one neighbourhood variable (typically income level or ethnic composition), we can estimate the relative impact of, for example, neighbourhood income while controlling for other neighbourhood characteristics (such as demographic household composition, share immigrants, and share with low education). We also interact these neighbourhood characteristics with individual characteristics to test the relative impact of different kinds of sorting.

We find evidence of sorting on all tested dimensions: ethnic, socio-economic and demographic. Thus, households generally move to areas where the other inhabitants have similar characteristics to their own. We find that income is the variable that explains most of the selective mobility pattern in the Uppsala housing market – not surprisingly since income determines what neighbourhoods people can afford to move to. Thus, as an example, part of the ethnic sorting on the housing market is explained by differences in income between ethnic groups and income levels (prices) between neighbourhoods. In the paper, we argue that our results support the need for caution with respect to selection bias in neighbourhood effect research. Neighbourhood choice is evidently a highly selective process, even working as we do with data from a medium-sized town in Sweden, a country known for its relatively small degree of polarisation among neighbourhoods. Processes of neighbourhood selection are thus likely to be at least as evident in more polarised countries and contexts.

**Paper IV: Moving near family? The influence of extended family on neighbourhood choice in an intra-urban context**

The fourth paper digs further into the issue of how moving individuals or households choose their destinations. It explores a variable rarely discussed in residential mobility studies (although well known in the literature on long-distance migration), namely extended family ties. The study asks whether having family in a neighbourhood affects the likelihood of moving there, and which individuals are most likely to move to areas where family members reside. Family or social networks are sometimes mentioned as explanatory factors in the literature on neighbourhood selection processes, e.g. in ethnic
clustering theory, but the actual impact of family is rarely explored in empirical, quantitative studies.

The study relates to the literature on neighbourhood selection in two different ways. First, an impact of family location on residential choice may result in selective mobility patterns over generations, providing a truly longitudinal perspective. For example, ‘place socialisation theory’ suggests that ideas about ‘good’ and ‘bad’ neighbourhoods are formed during childhood and are much influenced by parents. A complementary theory suggests that information is spread through family networks (among others), thereby affecting mental maps and consequently neighbourhood choices. Thus, the mobility decisions of parents affect the mobility decisions of their offspring. Second, the study increases the understanding of how people choose neighbourhoods.

Results suggest that the location of extended family is indeed an important variable for neighbourhood choice. It remains strongly positive and statistically significant when controlling for a range of other neighbourhood characteristics related to neighbourhood population (demographic, ethnic, socio-economic) and housing characteristics. I also address the issue of who it is that moves near family. Results show that those most likely to make such a move are individuals who have previously resided in the neighbourhood (within a five-year period from the move), which I interpret as support for theories related to information, socialisation and potentially also to affinity, assuming that family members also lived there at the previous point in time. Other groups found to have an increased probability of moving near family are non-Western immigrants, middle-aged people, and those with a low socio-economic position.

**Paper V: Neighbourhood sorting through income and the effects of neighbourhood mix on income: a holistic empirical estimation**

The fifth paper is co-authored with George Galster (Department for Urban Studies and Planning, Wayne State University). It represents an attempt to adopt the holistic framework and estimate both neighbourhood effects and neighbourhood sorting simultaneously. We estimate two equations in which the key variables are modelled as endogenous – one that estimates how individual income affect the income mix in the neighbourhood of residence (i.e. neighbourhood selection) and one that estimates how income mix in the neighbourhood of residence affect individual income (i.e. neighbourhood effects). The study encompasses all adult males who resided in Stockholm during the entire 1995-2006 period. We employ annual demographic, socio-economic and geographic data over the same time period.
To understand how endogeneity affects measurements of neighbourhood effects, we estimate two different models. The first is a fixed-effects model for panel data intended to control for selection bias only. The second model is similar but the endogenous independent variables are replaced with instrumental variables, intended to perform similarly as the endogenous variables but without being subject to this source of bias.

We find that results change substantially once endogeneity is controlled for. Our estimated neighbourhood effects become larger when controlling for endogeneity compared to when controlling for selection bias only, and this is true regardless of whether we estimate neighbourhood income mix on the basis on percentage high or low income neighbours. Thus, our results suggest that there is a risk that the results from previous studies that control for selection but not endogeneity are biased downwards. Similarly, we find that endogeneity also bias neighbourhood selection on income downwards, at least when percentage high-income neighbours is the dependent variable. When replacing individual income with our instrumental variable, the coefficient gets substantially larger. However, when modelling selection of low-income neighbours with instruments, the coefficient gets statistically insignificant. Although this single study is based on a specific group of people in a specific context, we argue that our results are provocative enough to warrant conclusion about the need to take endogeneity bias into account to avoid erroneous estimates.
6. Conclusions and suggestions for future research

The main aim of this thesis has been to provide an argument for a theoretical framework of neighbourhood effect research that also includes processes of residential mobility, and to discuss how such a framework results in methodological challenges that are important to address to obtain unbiased estimates of neighbourhood effects. This argument is developed in this comprehensive summary in combination with the five papers that all tackle the problem of connectedness between the two fields of study from different angles. It is supported by conceptual figures, discussions and reviews of both sets of literature, empirical findings, and conclusions drawn from the problems faced by previous research. In this part of the thesis, I will (bravely or foolishly) assume that the reader accepts my arguments inasmuch as he or she agrees that the two fields of residential mobility and neighbourhood effects are connected. This assumption is necessary in order to be able to discuss results and draw conclusions in light of the other research questions related to (potential) consequences of a holistic framework.

The conclusions that are discussed in this part of the thesis mainly concern the identified methodological challenges and how they can be met. Some of the papers, however, not only contribute to a better understanding of selection processes or similar, but are also empirical studies of specific mobility patterns/neighbourhood effects. Such conclusions, drawn from the specific research questions of the respective papers rather than from the uniting questions asked in the beginning of this comprehensive summary, are discussed in respective papers.

The research questions posed at the beginning of this comprehensive summary are related mainly to the neighbourhood effect literature. Indeed, most of the discussions in the thesis are directed to this field of study, as are the discussions in this chapter, but a truly holistic approach should also take the other field into account. I will therefore also discuss implications of my results for the field of residential mobility. I would, of course, opt for more studies that include both fields in their empirical research. However, the number of studies that concentrate on modelling processes in ‘only’ one field will very likely be much larger than those modelling mobility and neighbourhood effect simultaneously; hence I will focus on discussing what these studies need to take into account in order to improve estimates from the
Implications for neighbourhood effect research

The papers that constitute this thesis mainly focus on methodological problems that face studies of neighbourhood effects as a result of the mobility of individuals. Although I will devote most space to these methodological problems and their potential solutions, I will begin this discussion with some thoughts about theory. In this thesis, I suggest that mobility has not been given enough attention in neighbourhood effect theory: when it is included, it is mainly discussed as something that affects residential segregation and thus theoretically takes place before neighbourhood effects are measured. I argue that this arbitrary temporal divide implicitly result in a view of neighbourhoods as static – at least during the time of measurement. Neighbourhoods are, however, not static. They do not only change through the mobility of people. In line with scholars like Anthony Giddens, Edward Soja and Allan Pred, I argue that the structural circumstances, the ‘opportunity structure’ that according to neighbourhood effect theory sets the stage on which individuals operate, are constantly reproduced through individual action and thus subject to change. What does this mean? It means that neighbourhood effect research cannot simply assume that people who live in a poverty neighbourhood year 1 will do so also year 5: the individual may have moved (once or several times) or the neighbourhood may no longer be a poverty neighbourhood (or at least, the structural circumstances may have changed). It means that dynamics take place all the time, and thus must be included in theories and estimates of neighbourhood effects. It means that we cannot understand neighbourhoods if we do not take neighbourhood dynamics into account. I have in this thesis chosen to focus on mobility since this is a clearly visible aspect of neighbourhood dynamics.

However, it is not an easy task to uncover all ways in which mobility affect neighbourhoods and neighbourhood effect research, and an even more difficult task to address the methodological challenges it raises. In the thesis, I have identified four such: measuring exposure time, addressing potential neighbourhood change, selection bias and endogeneity bias. In my view, the first two problems relate to a theoretical understanding of what neighbourhood effects are, and to transmission mechanisms. For example, I find measuring exposure time to be necessary in order to be able to say that an estimate is indeed a neighbourhood effect: for how can it be such if an individual has not resided in the neighbourhood long enough for transmission mechanisms to operate, according to neighbourhood effect theory? The second two problems relate more to whether effects are results of the neighbourhood
or of something else – individual characteristics or joint decision-making – and the discussion focuses on the size and reliability of estimates.

All four challenges need to be addressed in order to provide convincing estimates of neighbourhood effects. To be able to do so, it is necessary to have access to longitudinal data. Data is generally considered to be longitudinal if it contains a minimum of two points of measurement for each unit of analysis (normally individuals). Working with such data allows for controls of selection and endogeneity bias through one of the various techniques listed in Paper I. However, to satisfactorily address the challenges raised by mobility, data should contain more points of measurement with as short intervals as possible. Residential mobility is not a point-in-time event that can be controlled at the end of a period. People move all the time. To be able to estimate exposure time for all these potentially mobile individuals, one must have data on as many moves as possible. Exposure time can be controlled by including some kind of measurement of mobility. How these should look like depends on the structure of the dataset but possible alternatives include year of entry to the neighbourhood, number of moves conducted during the period of measurement, number of years in neighbourhood etc. Another possibility is to limit the sample to non-movers, although that may result in additional problems with selection bias.

The second problem, potential neighbourhood change, could, if the assumed mechanisms are related to institutions and external forces rather than social interaction, be controlled for by looking at neighbourhood development during the period of interest. If substantial changes occur that are likely to affect the outcome of interest, these must somehow be controlled for in the model. If the hypothesised mechanisms are socio-interactive, it is necessary to look into average mobility rates. This will not solve the problem but may provide additional thoughts on the reliability of the hypothesis. To fully account for neighbourhood change in relation to socio-interactive mechanisms, one must have complete information about all moves that have taken place during the time period, characteristics of all movers, and information about existing networks within the neighbourhoods.

Longitudinal data is also necessary to meet the problems of selection and endogeneity bias. Selection bias is a well-known issue in neighbourhood effect research but, although most recent studies attempt to control for it, the existence of neighbourhood effects is still debated due to the potentiality of such bias. None of the existing methods (see Paper I) are perfect, leaving space for discussions and doubt. The clear patterns of neighbourhood sorting found in the four empirical papers that look into neighbourhood selection processes suggest that the neighbourhood choices of individuals and households are systematic and likely related to other factors, and thus that selection bias is indeed a serious problem. The fact that the studies are conducted in Sweden, a country known for its relative equality (regarding income, gender, ethnicity etc.), makes it probable that the sorting of households into
neighbourhoods and consequently also selection bias is an even bigger problem in countries with a higher degree of polarisation.

Most neighbourhood effect studies that control for selection bias do so by employing one of several available econometric techniques. Although these methods serve their purpose and get rid of (some of) the bias, I argue that there are alternative methods that would not only obtain the same result but furthermore provide additional insight into neighbourhood selection processes as well as casting more light on how processes of residential mobility affect neighbourhood effect research and vice versa. Galster and I provide an attempt at such a ‘holistic’ study and find that our estimates of both neighbourhood selection and neighbourhood effects change significantly when controlling for selection and endogeneity bias (Paper V). We end our study by urging replication in other contexts, but I would also be interested in seeing more studies on neighbourhood effects that control for selection by actually modelling selection processes (for empirical attempts, see Ioannides and Zabel, 2008; Sari, forthcoming). A better understanding of how households choose neighbourhoods, i.e. the processes behind selection bias, would greatly enhance the potential to successfully employ such models to get rid of bias. Such knowledge would mean that the most important variables could be included in models, thus making them better controls for selection bias; otherwise, researchers without these variables would need to choose alternative methods.

Not all scholars do have access to the kind of high-quality longitudinal data that I argue is necessary to be able to convincingly estimate neighbourhood effects. This is, of course, unfortunate but does not change the fact that this kind of data is needed to account for the challenges caused by residential mobility. Fortunately, longitudinal datasets are currently becoming available in an increasing number of countries, whether based on population registers or large follow-up surveys. The possibility of conducting neighbourhood effect studies that take mobility into account has thus never been better.

Conclusions related to residential mobility research

As mentioned in the introduction as well as in Chapter 3, there is a comparatively large amount of research on how various household characteristics in relation to dwelling attributes affect residential mobility decisions. Less is known about how different neighbourhood characteristics affect such decisions. The relatively limited number of existing studies has focused mainly on a small set of variables, especially the neighbourhood’s ethnic and socio-economic population composition. Three of the five papers in this thesis contribute to this literature by modelling neighbourhood choice in one way or another and a fourth paper models where people live. Thus, these studies
cast further light on the processes that may result in selection bias in neigh-
bourhood effect research.

In Paper II, van Ham and I show how neighbourhood change is related to
processes of selective mobility, in this case measured in relation to ethnic
composition and employment levels. However, we find that moving individ-
uals value other neighbourhood factors more highly (especially safety, visual
beauty, and access to green areas) and suggest that these generally unmea-
sured factors are likely also to produce patterns of selective mobility and
consequently lead to selection bias. Family did not seem to be very impor-
tant based on the survey results presented in Paper II, but in Paper IV I find
that the location of family has a strong effect on neighbourhood choice – the
attraction of family was found to be equivalent to a neighbourhood median
income increase of almost three standard deviations. I also find differences
in the tendency to move near family. Especially prone to conduct such a
move were non-Western immigrants, people with low socio-economic posi-
tion, people in age group 45-64, and those who had previous experience of
the neighbourhood where their family members lived. However, more work
is needed to understand how family and friends affect neighbourhood choic-
es (see Mulder, 2007).

In Paper III, van Ham, Manley and I look into the relative impact of vari-
ous aspects of neighbourhood sorting and find that income is the most im-
portant factor. When controlling for income sorting, i.e. that high-income
individuals move to high-income neighbourhoods and low-income people
move to low-income neighbourhoods, the estimates of ethnic sorting, demo-
graphic sorting and other forms of socio-economic sorting (education, em-
ployment, social welfare) become reduced, suggesting that much of this sort-
ing is due to income. Much work remains to be done, however, in this field.
Extensive exploration into neighbourhood variables that affect residential
choices and analyses of what these relationships look like (levels, potential
thresholds, relative importance etc.) is a task for future research. Something I
would find of special interest is to study if and how neighbourhood choice is
affected by processes within the neighbourhood of origin, i.e. neighbourhood
effects on mobility.

Another important task for residential mobility research is to address
some of the methodological problems that affect neighbourhood effect stu-
dies. As Galster and I show in Paper V, estimates of neighbourhood sorting
are affected by both selection and endogeneity bias, at least using the me-
thsods we employ. Selection could, for instance, mean that the impact of in-
ome or ethnicity is biased upwards and its relative importance overrated in
relation to other, yet unmeasured, characteristics of individuals or neigh-
bourhoods. For example, we find in Paper III that the impact of ethnic sort-
ing is reduced when controlling for sorting on household demographic com-
position and socio-economic resources. Again, a better understanding of
other factors affecting neighbourhood choice would provide at least part of
the solution.

Longitudinal data are necessary for neighbourhood effect studies but are
also beneficial for estimates of neighbourhood choice on the micro level or
neighbourhood sorting patterns on the macro level. Both processes are likely
to be related to previous experiences of neighbourhoods (see Paper IV) and
individual mobility histories, something that also needs to be explored fur-
ther by future research. There is thus much work still to do in this field.

So what? A note on policy

One justification for spending public money on social science research is its
potential for changing societies for the better by addressing societal prob-
lems, identifying causes and suggesting solutions. Both fields I have dis-
cussed in this thesis have their own social problems as objects of study and
their own discussions about policy implications of their research findings.
Analysing the causes of residential segregation is one of the key issues in the
residential mobility literature that deals with neighbourhood choice. Why do
some groups inhabit certain neighbourhoods? How are such patterns pro-
duced and reproduced? And how can we, if causes are identified correctly,
provide better choice opportunities for some without degrading the oppor-
tunities of others? To the extent that neighbourhood effect studies estimate
consequences of segregation, the two fields are also connected policy-wise.
Changing the patterns that cause residential segregation may be one solution
to prevent negative neighbourhood effects. Other potential policies that
might prevent negative effects that are commonly discussed in neighbour-
hood effect studies relate to planning, social mix policies, and area-based
interventions.

My thesis does not result in any advice to planners or practitioners. It is
an academic thesis, aimed towards an academic audience. However, it does
contain empirical studies and consequently empirical conclusions. Although
these are not intended to result in policy change, they should be seen as con-
tributions to the existing knowledge in their respective field of research.
Together with the findings of previous and future studies, they thus create a
knowledge base which might lead to improved policy recommendations.

The most important argument as to why my research is important from a
societal perspective is, however, related to the conclusions we can draw from
other research. If there is a problem with the theoretical conceptualisation,
methodological tools and ultimately actual estimates, empirical conclusions
might turn out wrong and so might the consequent policy suggestions. Thus,
the long-term aim of the thesis is to contribute to more reliable results in
both fields, providing a better ground for policy decisions. Whether this aim
will be fulfilled depends on if and how future research addresses the metho-
dological challenges identified. Recent scientific discussions and advancements in both fields do provide for some optimism. The mutual connections between the two fields are increasingly recognised by scholarly work (Galster, 2003; Sampson and Sharkey, 2008; Doff, 2010; van Ham and Manley, 2010) and have also been discussed at several recent international research seminars/workshops. I hope and believe that this thesis will contribute to the continuation of this process.

I am thinking especially of the two ESRC seminars ”Neighbourhood Effects: Theory and Evidence” (St Andrews, February 2010) and ”Understanding Neighbourhood Dynamics” (Manchester, September 2010), and the QMSS2 seminar ”Neighbourhood Dynamics and Contextual Effects” (Uppsala, June 2011). There may be others I am not aware of.
References


