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Neighbourhood effects on residential mobility? An analysis of intra-city moving patterns in Stockholm.

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Abstract

Choosing a new home and home area is a complex decision, influenced by a large set of factors. In this paper, it is hypothesized that one of these factors are social processes in the neighbourhood of origin, i.e. that neighbourhood externalities not only affect social mobility but also physical mobility. Information about vacancies and potential destinations is spread through localized networks, local socialization processes affect ideas about neighbourhood attractiveness, and neighbourhood-related stigmatization may limit the range of choices available to movers. According to the hypothesis, all of these processes influence the final choice of destination neighbourhood. If valid, mobility patterns should be affected in the sense that movers from a specific origin prefer some destinations over other. The paper tests this hypothesis by examining intra-city moving patterns in Stockholm. Drawing on geo-coded longitudinal data, I estimate relative flows of mobility between each unique origin-destination pair and the explanatory values of factors related to specific and relative neighbourhood characteristics in term of size of population, housing and socioeconomic composition, distance and previous flows of mobility. I then examine divergent patterns, flows of mobility between specific origins and destinations with large residuals meaning that they cannot be explained by the above factors. Something else affects these flows of mobility, something that potentially can be related to social processes in the neighbourhood of origin. The aim of the paper is thus not to prove that neighbourhood externalities do affect intra-urban moving patterns, but to explore the possibility, provide a basis for future studies, and to theoretically argue for the importance of linking together the fields of neighbourhood effects and residential mobility.

Keywords: Residential mobility, moving pattern, neighbourhood effects, path dependency, Stockholm

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Exploring residential mobility patterns is crucial in understanding the development of patterns of demographic and socio-economic segregation. The aggregate moves (and non-moves) of households of different social status can either change relative characteristics of a neighbourhood or stabilize them over time. The literature on the dynamics of segregation is growing, especially with focus on disadvantaged groups, but more work is needed. We know for example very little on how neighbourhoods affect intra-urban mobility (Ham & Feijten 2008).

We do know more about how neighbourhoods affect the opportunities for social mobility of their inhabitants. A constantly growing literature from both sides of the Atlantic shows that neighbourhood externalities have effect on income, employment opportunities, school grades, crime levels etc., and that these effects are negative for those living in deprived areas (see e.g. reviews by Leventhal & Brooks-Gunn 2000; Sampson et al 2002). Galster and Killen (1995) argue that the physical and social environment in the neighbourhood affects the inhabitantsô decision-making. Decisions are made on the basis of preferences, aspirations, norms and values, and subjective perceptions of possible outcomes, and all of these factors are in turn affected by social processes within the neighbourhood. It is a short step to also include decisions about physical mobility in this argumentation, but it is a short step yet to be taken. This gap in literature is remarkable, considering the interconnectedness of moving patterns, segregation and neighbourhood effects. We know that moving patterns affect segregation. Connecting neighbourhood effects to mobility would mean that segregation also affects moving patterns, and thus in turn segregation.

If there is something to the idea of neighbourhood externalities do affect residential mobility, it should be visible in moving patterns. Hypothetically, moving patterns would be biased towards some areas while moves to other potential destinations are less frequent. Hence, the aim of this study is to analyze intra-city moving patterns between and within neighbourhoods. This will be done through analyses of flows of mobility between all origin-destination pairs on an aggregated level in Stockholm, in a two-step-process. The first step is to identify geographical moving patterns on a neighbourhood level. Relative flows of mobility, measured as the permillage of movers from origin *i* to destination *j* based on population in *i*, between all *ij* pairs are first calculated and then used as dependent variable in a regression analysis. The regression aims at estimate how much of relative flows of mobility that can be explained by traditional explanations -- number of available dwellings in destination, distance, differences in housing composition and socio-economic characteristic --, the relative importance of these factors, and to form a basis for a further examination of divergent patterns. The identification of such divergent patterns is the second step of the analysis. This is done by calculating residuals for each unique origin-destination pair, where large positive residuals means that this specific stream of movers cannot be explained by traditional factors. The finding of such patterns would indicate that there is *something else* affecting mobility, something that make movers from a unique neighbourhood prefer moving to another specific neighbourhood instead of any other destination. It would thus provide a good basis for future studies on what this ósomething elseô might be.

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lential mobility

ñ[L]ittle work has been done on the specific neighborhood factors affecting mobility behaviourò. This was stated by Quigley and Weinberg (1977:55) over 30 years ago, but is still valid. Despite the large literature on residential mobility and factors affecting mobility behaviour, studies discussing how the neighbourhood affects moves are hard to find. Yet, social scientists have for long been interested in how the local environment affects human opportunities, action and decision-making (Lee et al 1994). In 1981, Fernandez and Kulik showed that it affects life satisfaction in general. Since then, numerous studies has shown effects on labour market position, income, level of education, school grades, teenage pregnancies, crime and many other indications of social status and social mobility. The interest is partly driven by the segregated city, causing different types of effects in different types of areas. The term ógeography of opportunityô (Galster & Killen 1995; Rosenbaum et al 2002) has been proposed to describe a situation where residential segregation and neighbourhoods of different status and resources affect the opportunities of their inhabitants in different directions. While positive externalities in the wealthiest areas provide inhabitants with even better opportunities for social upward mobility, negative externalities further restrict those living in the most deprived areas.

The residential mobility literature is not completely ignorant to the importance of the local context. There are in fact several studies discussing the relationship between local context, migrantsô decision-making, and levels of out-mobility (some recent studies are made by Clark & Ledwith 2006; Feijten & Ham 2008; Ham & Clark 2009). One of the most ambitious attempts was made by Lee et al (1994), concluding that the subjective evaluation of the neighbourhood of residence had a strong impact on mobility thoughts but less on actual mobility. However, there is one important distinction between this literature and the theory of neighbourhood effects. When Galster and Killen (1995) discuss how the neighbourhood affects inhabitantsô decision-making, they do not only discuss this based on subjective evaluation, but also on how social processes in the neighbourhood influences decision-making. That is, local role models, peer pressure, embedded resources, relative status of groups etc. would in this example *affect the subjective evaluations* and thereby thoughts and actions related to mobility.

The growing literature on neighbourhood effects have come up with several different mechanisms, often sorted into endogenous, exogenous and correlated effects according to Manskiôs (1993) categorisation. The endogenous effects are of most relevance to my study as they refer to how the decision-making and actions of individuals are affected by processes *within* the neighbourhood. Three types of endogenous mechanisms; socialization, social networks, and endogenous stigmatization, are of special interest to my study. Interestingly, despite the lack of studies focusing on neighbourhood externalities and their effects on residential mobility, several theories in the residential mobility and migration literatures discuss mechanisms that are remarkably similar to neighbourhood mechanisms, without making the explicit connection (table 1).

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Mechanisms and Migration Theories

	Theories in the Residential Mobility literature
Socialization	Chain migration, Household decision-making, Cognitive landscapes
Selective socialization	Selective mobility ("White flight")
Social networks	Chain migration, Information diffusion ("action space"), Family ties, Location-specific capital
Endogenous stigmatization	Housing market "gate-keepers", Selective mobility ("White avoidance")

The concept of chain migration, or migration networks theory, refers to the tendency of migrants to follow the paths of previous migrants. These regular patters occur due to social networks, which act as catalysts spreading the very idea of migrating. They also operate through the location of previous migrants, who by their very existence at a location facilitate the migration of others to this place through spread of information and potential help before, during and after the move. These early movers can thereby be seen as a form of location-specific social capital only accessible by moving to that specific place (Castles and Miller 2009: 27-31). Chain migration is most often used in the international migration literature but does despite that show remarkable similarities with endogenous neighbourhood effect mechanisms such as socialization and social network effects. Socialization refers to social learning in a neighbourhood through adaptive behaviour, imitation, role models, peer influence etc. All of these are factors likely to affect both the propensity to move and the choice of destination. The sequence of a migration chain, with a few pioneer movers followed by more and more migrants, supports that ideas about migration is spread, that the mobility of some encourage others to follow their path, and in a later stage a normalization of migration. Vartanian et al (2007) have explicitly made the connection between socialization and place of residence, studying how neighbourhood status is "inhereted" over generations. They argue that social learning in terms of how childhood perceptions shape cognitive landscapes is one explanation for why children growing up in poverty neighbourhoods also tend to live in such environments as adults (see also Sharkey 2008). Socialization can be selective, meaning that it only takes place within certain groups. That would in this case cause selective mobility patterns, such as "white flight". "White flight" refers to the out-mobility of members of the white (or other ethnicities, see Pais et al 2009) population when the share of minorities reaches a certain point (Bråmå 2006). Even though theory claims that the out-movers react to the share of minorities (either racially (Farley et al 1994) or socio-economically (Harris 1999) motivated), they can also be hypothesized to base decisions on actions from members of the own group and thus move when others do so. Socialization can also be hypothesized to take place only after behaviour reaches a certain level, known as epidemic theory. Turnover rates over a certain point could e.g. affect mobility thoughts of others.

Socialization may take part within social networks but networks also affect mobility in other ways (Ritchey 1976; Jones 1990). One of the most important roles of social networks according to the migration literature is to provide information. Information increases the migrant's awareness space, adding potential destinations to it, but may also reduce attractiveness of a place if the information is negative. Social networks are also important attractions in themselves. The location of friends and family are by some scholars listed as the most important explanation for long-distance moves (Castles & Miller 2006), but is also likely to affect moves across shorter distances. Social networks, or rather the location of friends and family, constitute part of the location-specific capital, resources bound to a specific location adding to its attractiveness as a place of residence. The location-specific capital is often strongest on the place of residence, which partly explains people's tendencies

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hbourhood (DaVanzo 1981). Social networks often but are yet quite local in character (McPherson et al 2001) which make them relevant for neighbourhood effect studies. In this literature, they are often thought of as a resource providing help to residents in various ways (e.g. in the labour market), similar to location-specific capital. Due to residential segregation, networksô tendencies to be relatively local, and the shifting in how well they stretch into other social environments depending on the status of neighbourhood, the amount of resources provided by social networks varies a lot between different social environments with poverty neighbourhoods generally having the least.

Endogenous stigmatization refers to the negative stereotyping of a neighbourhood due to its household composition. This may be related to selective mobility theories, if the ethnic composition in a neighbourhood affects the moves of others. This is the case in ówhite avoidanceô theories, where members of the majority avoid areas inhabited by minority groups (Bråmå 2006). It can also be related to theories focusing on the influence of housing-market gate-keepers (e.g. landlords, public or private housing companies and real estate agents) and the practise of óracial steeringô, suggesting that flows of mobility are directed to or away from certain neighbourhoods (Jones 1990).

Attractiveness and Choice of Destination

A key concept one cannot escape when discussing mobility in terms of flows between origins and destinations is attractiveness (Jones 1990). This term may also be linked to neighbourhood effects as ideas about neighbourhood attractiveness and thus household decision-making may be affected by socialization processes. Attractiveness is not easily defined but I will not trying to define it here, rather just use it as a concept signalling that people may prefer one neighbourhood over another. Brown and Moore (1970) argue that attractiveness is what makes a household choose one dwelling over another. However, this choice is limited to a few alternatives. Each household are assigned a search space, defined as available dwellings (in terms of vacancies, price, systems and structures) within the action space - ñthose locations for which the intended migrant possesses sufficient information to assign place utilitiesò (p.1). The final alternatives are according to Brown and Moore evaluated based on the householdôs own definition of attractiveness. This may include factors associated with the dwelling, such as size and price, as well as neighbourhood characteristics, such as location, standard and population composition. Ideas are however quite similar, making it possible to generalize. A study conducted by the Stockholm regional planning and traffic board (Regionplane- och trafikkotoret, RTK, 1998) on mobility patterns and thoughts in Stockholm showed that the Inner city was generally perceived as the most attractive destination, followed by the own neighbourhood. Most of the respondents preferred a larger dwelling, preferably a single home, and would be willing to pay more for such a home. The willingness to move was largest in distressed neighbourhoods. Attractiveness must however be seen as a relative concept. The search for a new home means a search for a place that is conceived *more attractive than the previous location*.

Another factor affecting both action/search space and attractiveness is distance. Distance can be measured in a variety of ways, like mental distance, social distance and geographical distance. Mental or social distance affects peopleôs likeliness of moving into a different social environment ï most moves are conducted between areas of similar characteristics. Geographical distance is however still important. Spatial interaction models are based on the

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that the number of movers decreases as distance xponential. One of these is the gravity model, arguing that distance in combination with the masses of population at origin and destination is the most important factor in explaining migration flows (Zipf 1946; Jones 1990). Seven out of ten Swedish moves are conducted within a municipality, the most common being a move within the same parish (within or to the adjacent neighbourhoods) (Statistics Sweden, estimate for year 2004). Geographical distance is closely related to location-specific capital, as a short-distance move allows the mover to maintain knowledge, friendship ties etc. Distance also affects knowledge ï knowledge is generally better and conceived more reliable (due to first hand experiences) of places located nearby. Both location-specific capital and knowledge are factors having a positive effect on attractiveness, making nearby destinations more probable.

Data and Method

The theoretical arguments presented here suggest that neighbourhood externalities are likely to affect moving patterns. Such effects would be visible in moving patterns. If processes in the origin do ósteerô its movers to specific destinations (including the origin), patterns should be directed to a few areas, and this bias should remain after controlling for characteristics in the origin and destination affecting size and direction of mobility and variables related to relative attractiveness of origin and destination. The first step in the analysis of moving patterns is thus to estimate flows between origin, *i*, and destination, *j*, pairs, including moves within a neighbourhood (*i*=*j*).

The data in the paper is a subset from *GeoSweden*, a longitudinal database including all individuals who have resided in Sweden during the period 1990-2006 with demographic, socioeconomic and housing data and geographical coordinates for each person and year (housing data every second year). The individual data in GeoSweden has been aggregated on a neighbourhood level. Aggregation is necessary to be able to study flows of mobility between all possible *ij* pairs in the same analysis. Neighbourhoods are defined according to SAMS (*Small Area Market Statistics*) units, small areas which divisional basis is homogeneity in function and housing stock and which reflect ñnaturalò/bespoken neighbourhoods quite well. Only SAMS with a minimum of 100 inhabitants are included in the analysis. 128 such areas have been identified, defined as origin neighbourhoods in the study. As Stockholm municipality is located in the midst of the Stockholm region, and is surrounded by municipalities within commuting distance to the city centre, the municipal border cannot be seen as a ónaturalô border for mobility, especially not for those living in the municipal outskirts. In order to allow for moves across the municipal border, Stockholmôs ten neighbouring municipalities (Järfälla, Ekerö, Huddinge, Tyresö, Nacka, Lidingö, Danderyd, Solna, Sundbyberg and Sollentuna) are together with Stockholm municipality included in the analysis as destination areas. The total number of SAMS units with a minimum of 100 inhabitants in these eleven municipalities is 404, which constitute the studyôs destination neighbourhoods. The 128 origin areas and 404 destination areas gives a total of 51,712 possible *ij* pairs (moves within neighbourhoods included) which form the basis for the analysis. Some basic descriptive statistics for the origin and destination areas included in the analysis are found in table 2.

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n and Destination Neighbourhoods, 2004 (Destination

Origin areas (N=128), *Destination areas (N=404)*

	Mean		Minimum		Maximum	
No of inhabitants	5984	*3085*	261	*101*	19153	*19153*
No of in-movers (00-06)	3691	*1112*	94	*1*	13970	*11270*
Mean age	40.4	*34.8*	30.4	*25.0*	48.9	*48.9*
Median disposable income	1653	*1775*	1004	*973*	2320	*2,68*
% Employed	61.0	*72.0*	37.8	*37.8*	76.8	*92.9*
% Foreign background	22.3	*22.1*	6.2	*3.8*	88.7	*88.7*
% High education	52.0	*52.1*	29.3	*25.6*	84.1	*88.5*
% Social benefits	4.5	*2.4*	0.1	*0.0*	27.1	*27.1*
% Multifamily housing	73.5	*57.2*	0.0	*0.0*	100.0	*100.0*
% Renters	45.7	*32.0*	0.0	*0.0*	100.0	*100.0*

A move is in the study defined as a change in geographical coordinates (north and/or east) between time t and t+1. Moves can be conducted both within and between neighbourhoods. However, as coordinates are 100*100 meters, a move must be at least 100 meters to be detected. Number of movers is measured in one-year intervals, 00-01, 01-02é 05-06. Numbers between each *ij* pair has then been added up for the six year-intervals, giving the total number of movers between each pair of neighbourhoods 2000-2006. This was done to find more clearly pronounced patterns over time and to avoid overestimating the magnitude of small temporary flows. Since the aim of the paper is to analyze whether neighbourhood effects operating in the origin might affect moving patterns, the flows from each origin must be analyzed in relation to each other. The number of movers between each *ij* pair is thus transformed into permillages, using the total population to have resided in *i* 2000-2006[1] as denominator. Only adult individuals (age 18+) are included in the data subset, to avoid overestimating flows consisting of large households.

$$Y_{ij00\text{-}06} = \times M_{ij00\text{-}06} / \times P_{i00\text{-}06} * 1000$$

Step two in the analysis is to find variables to explain the patterns found, or rather control for óstandardô explanations of moving patterns. This is done by a regression analysis. Since the direction and relative size of flows is what to be explained, the calculated permillages are used as the dependent variable. The model thus explains aggregated flows of moves and the number of cases is the total number of *ij* pairs in the study. Since the study operates on an aggregate level, the independent variables must also be aggregated to describe neighbourhood characteristics. The independent variables are of two kinds: they either describe a characteristic of *i* and/or *j*, or measure characteristics as a relative *ij* value. Relative variables are used to control for relative attractiveness, i.e. if flows go towards areas with more or less of a characteristic than the origin.

The regression is first run for all neighbourhoods, in what I call the óEntire City Modelô. However, the literature on neighbourhood effects suggests that people are affected differently by neighbourhood externalities depending on the type of neighbourhood in which they reside. As can be seen in table 2, the neighbourhoods are of very different character, and must therefore be clustered according to their social status. I have clustered them into five groups using a simple k-means procedure. Seven different variables have been used for clustering: 1)

[1] Total population 00-06 is measured as total population year 2000 plus in-movers 01-06. People who have left and then returned are thus counted twice, but they have also had two chances to move out.

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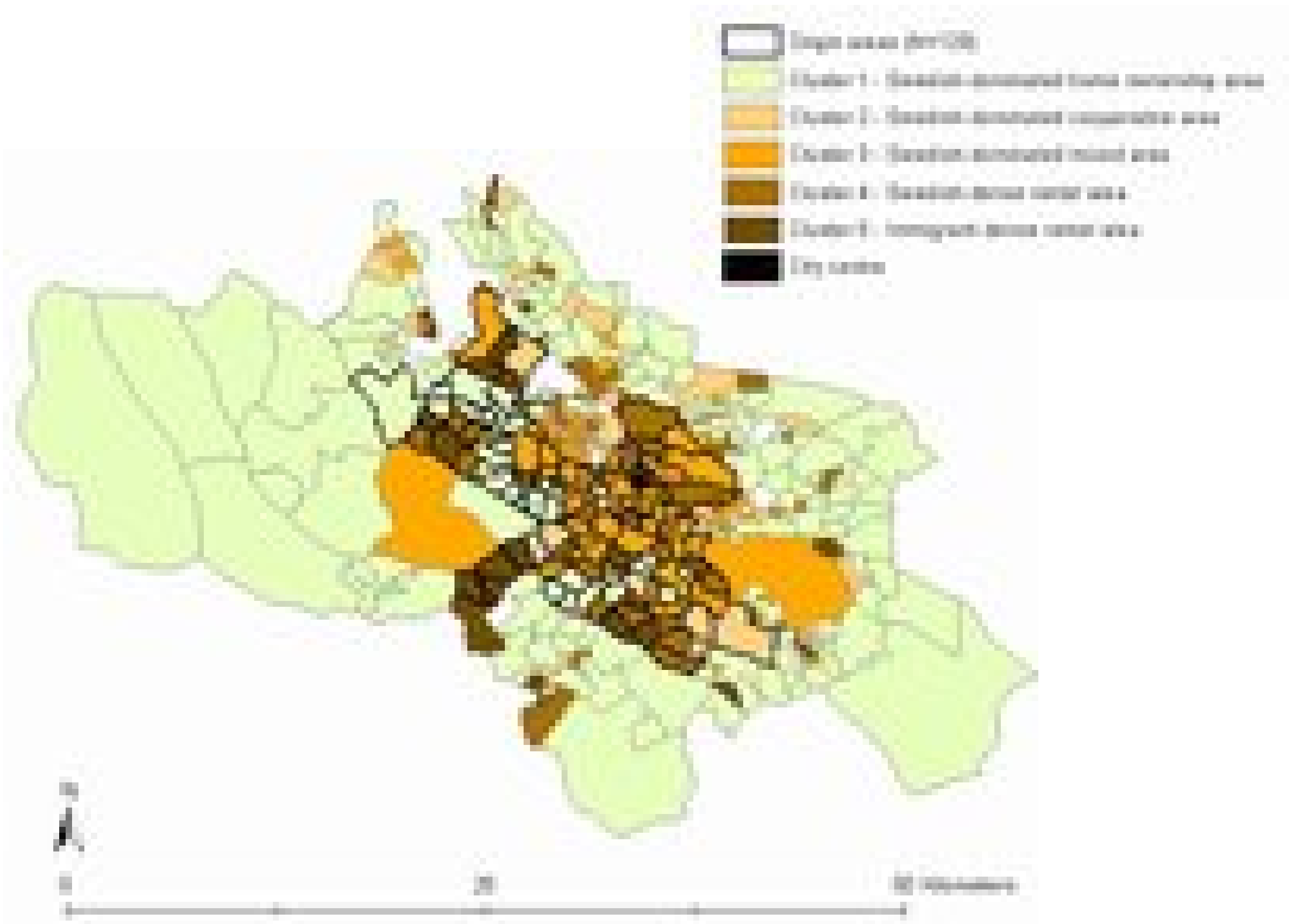
on (minimum two years at University), 2) share of igh income earners (highest quintile), 4) share of population receiving social allowances, 5) share of population with non-European background (born outside Europe or Swedish-born with two parents born outside Europe), 6) share of population living in home ownerships, 7) share of population living in rentals. The five clusters reflect a socio-economic ranking, with Cluster 1 being the wealthiest and Cluster 5 poorest. All neighbourhoods have been included in the clustering procedure, in order to be able to control for whether flows go between neighbourhoods belonging to the same or different clusters. The óCluster-Specific Modelsô, as I call the regression models when run for each specific cluster, are however only based on origin cluster, and allows for flows to all clusters. Cluster means are shown in table 3 and their geographical distribution in figure 1.

Table 3: Cluster Means

	Cluster				
	1	**2**	**3**	**4**	**5**
% High education	54	55	54,6	47,5	36
% Social welfare recipients	2	1,7	3,4	6,2	12,7
% Non-european background	6,7	8,8	8,9	13,4	39,5
% Home owners	84,2	13,8	5,3	3,7	6,1
% Rental dwellers	7	12,3	48,4	80	79,5
% High income earners (5th quintile)	31,8	24,2	20,6	11,9	6,3
% Employed	83,9	84,5	78,7	73,6	67,1
No of origin neighbourhoods	32	9	49	26	12
No of *ij* pairs (*i* =cluster X, *j* =all clusters)	11968	3366	18326	9724	4488

Figure 1: Origin and Destination Area by Clusters (SAMS areas)



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...an be divided into five groups: basic characteristics, ...ocio-economic indicators, distance indicators, and previous patterns. The basic variables are those that can be expected to have a great impact on moving patterns: the number of inhabitants in *i* and their age composition, measured as both mean age and the share of young adults (age 18-29, the most mobile age group), and available dwellings, measured as the number of people moving from or within *j*. The household and socioeconomic variables are measured as relative variables, estimating differences in composition between *i* and *j*. The relative variables are meant to capture relative attractiveness of origin and destination, estimating whether flows go towards or away from areas with a higher share of X compared to the origin. Two different types of housing variables are used: whether origin and destination are mixed or homogenous (Ó 75 %) in terms of tenure, and differences in share of home ownerships, rentals and multifamily housing. Demographic indicators chosen are mean age, share of youth (age 18-29), share of married, share of people with children, and share of population with foreign background. Demographic segregation should mean that flows go towards similar areas in terms of the first four variables. Foreign background includes those born abroad as well as those born in Sweden to two foreign born parents. Ethnicity or share of immigrants is often found in the literature to have strong effect on moving patterns, e.g. in theories such as ówhite flightô. In the Swedish context share of foreign background can also be an indicator of socio-economic status of the neighbourhood, as seen by cluster means in table 3. Socio-economic indicators are share of population with high education (minimum 2 years at University/University College), share of employed (age 20-64), share of high income earners (highest quintile), share of low-income earners (lowest quintile) and share of social welfare recipients. Several measures of distance are also included to control for the distance-decay function: distance in meters between origin and neighbourhood, difference in distance to city centre, whether *i* and *j* are located in same or different municipalities, and whether they belong to different clusters. The last two are indicators of social distance rather than a geographical one. Finally, I use a variable controlling for previous moving patterns: the number of movers between origin and destination years 1995-2000, the five-year period previous to the studied one.

The regression is run as a five-step model, starting with basic characteristics and then adding a group of variables at a time, but only results of the full model are shown in the paper. All variables in the model are assumed to be multiplied, giving the following model:

$$Y_{00-06} = \text{Ŭ} * Z^{\text{б}1} * ZA^{\text{б}2} * e^{\text{б}3Dij} * M_{ij95-00}{}^{\text{б}4}$$

Since the dependent variable is continuous, the variables have been logged to estimate an OLS regression.

$$ln(Y_{00-06}) = ln(\text{Ŭ}) + \text{б}_1 ln(Z) + \text{б}_2 ln(ZA) + \text{б}_3(D_{ij}) + \text{б}_4 ln(M_{ij95-00})$$

where

Ŭ	is the fixed intercept.
Z	is a characteristic of *i* and/or *j*, measured at year 2004[2].
ZA	is a relative value of characteristics of *i* and *j*. ZA is defined as 100*Zj/Zi where each Zi and Zj respectively refers to a specific characteristics in *i* and *j*. Zi and Zj are both measured at year 2004[9].

[2] As housing data are only available every 2nd year in the GeoSweden database, 2004 is the best option as the mid-year.

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een *i* and *j*, set to 0.01 when *i*=*j*. Distance is measured nates of *i* and *j*. As coordinates are measured on individuals, the median is a measure of where in *i*, *j* people live. As the median coordinates change when people relocate, I have measured medians each year 2000-2006 and then used that median.

$M_{ij95\text{-}00}$ is the number of movers between *i* and *j* 1995-2000.

Running a regression is however not enough to say anything about neighbourhood processes steering flows of mobility towards certain neighbourhoods. Other explanations must first be excluded. One aim of the regression analysis is therefore to use it as a basis for calculating residuals for each *ij* pair. A large residual means that the relative size of the flow cannot be explained by the model, and thus that something else is causing it. Both large positive and negative residuals mean unexpected patterns, but I will here focus in the positive ones. Negative values often mean no movers, making the results difficult to interpret. Large positive residuals however indicate that the model cannot explain why so many people move from *i* to *j*. However, a large positive residual can be the result of one person moving between two areas that ôshouldnõtö be connected. Hence, the analysis will focus on *ij* pairs where the number of movers is 50 or more. Residuals are calculated based on the ôCluster-Specific Modelsö. Two residuals are calculated for each *ij* pair: one using a model where not previous patterns are controlled for, and one using a model including that variable. The exclusion of the previous pattern variable is motivated by the aim of the paper: to find divergent patterns that could be a result of social processes in origin. According to the theoretical argumentation, path dependency can be a sign of such processes, and the variable must therefore be omitted. Comparing the two residuals will however give an indication of to which extent previous patterns affect mobility. An *ij* pair with a high residual using the first model but a lower one using the second is a flow that cannot be explained by ôtraditionalö variables but nevertheless show stable flows over time.

Analyzing moving patterns

The estimation of moving patterns mainly consisted of creating a mobility matrix of all *ij* pairs, too large to be shown here. The general patterns are that the largest flows are found when origin and destination are the same. This is true for almost all origin areas, the few exceptions being sparsely populated neighbourhoods. The permillage of movers within neighbourhoods do however vary a lot, from 567 to 27, the mean being 107. As for moves where *i*Í *j*, the general tendency is that the largest permillages are found in areas adjacent to the origin, thus giving support to the distance-decay function. As can be expected, areas where the permillage of within neighbourhood-movers is high have in general smaller permillages to other areas. The degree of concentration also differs quite substantially. The most concentrated flows are found in Cluster 5, which can be expected since the poorest movers probably also are the ones with the fewest alternatives. The clusters are however very heterogeneous in terms of moving patterns, all including both concentrated patterns and more scattered ones. The total permillage of movers vary between 48 and 865, with a median of 426. This means that slightly less than half of those who have resided in a neighbourhood 2000-2006 can be expected to have conducted at least one move.

After estimating actual flows of mobility, next step in the analysis is to find explanations for these patterns. The first regression is made according to the ôEntire City Modelö, using flows between all *ij* pairs. Results are shown in the left column of table 4. The most important

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ows are number of inhabitants in *i*, number of out-
and previous flows between *i* and *j*. When running the model step-wise, these variables were also proved the most important substantially improving its explanatory value. Their relative magnitude was also maintained. The housing and socio-economic indicators had much less effect on the R2 value and do also, as shown in table 4, have substantially smaller beta values. Population in *i*, number of movers from *j* and number of previous movers all have positive effects on flows. It should be noted that previous flows is the second most important variable to explain present mobility, after number of out-movers from *j*, and that this result remains when controlling for cluster (with the exception of cluster 3 and 4, where it is the third most important variable). There are of course many possible explanations and interpretations to this, but it clearly signals path dependency even in short-distance moving patterns. Distance is however negative, supporting the distance-decay function. The other distance-related variables indicate that flows go towards the city centre, as hinted by the RTK study, but at the same time, leaving Stockholm municipality has a significant and positive value. These results may seem conflicting, but given the shape of Stockholm municipality, this is not necessarily the case: it is fully possible to change municipality but still move closer to the Inner city. The proportional change in flows is however negatively affected by a change of cluster, although the effect is very small, signalling that flows go between areas of similar status and composition.

The above variables are quite similar between clusters. The most important differences are found among the socio-economic variables (table 4). Share of population with foreign background is significant and important for both Cluster 1 (Swedish-dominated home ownership areas) and 5 (immigrant-dense rental areas), but while being strongly negative for Cluster 1, indicating a reduced proportional permillage of moves when the destination has a larger share of people with foreign background than the origin, flows from Cluster 5 rather seem to go towards places with a high share of people with foreign background. The share of population with low income are significant and negative for Cluster 2-5, indicating that flows are larger to destinations with higher incomes than the origin (although the positive results for share of social welfare recipients contradicts this conclusion). For residents of Cluster 5, this does however not indicate moves into ñwealthyò neighbourhoods as the results for high income earners and high education also are negative and of similar magnitude. Housing variables seem to have little effect in all five clusters, and are negative when significant, regardless of form of tenure. Another difference is found in distance to the city centre, which only seems to affect inhabitants in Cluster 1 (Swedish-dominated home ownership areas). The positive value indicates them moving closer to the centre. This result can partly be explained by these neighbourhoodsô locations on the fringes of Stockholm municipality, but is on the other hand somewhat surprising given that a move from Stockholm municipality to another home ownership area would in most cases be a move away from the centre. All clusters get positive significant values for crossing a municipal border. The proportional change in the permillage of movers from *i* to *j* thus seems to increase when the destination is located outside Stockholm municipality.

As indicated by R2 values, the explanatory power of the model is very different between clusters, increasing as the cluster becomes poorer. A possible interpretation is that people living in neighbourhoods of less social status are more affected by differences between origin and destination, probably because fewer destinations are open to them due to e.g. financial limitations.

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…owing Beta values for logged coefficients

	City	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
No of inhabitants *i*	0,167 ***	0,121 ***	0,191 ***	0,128 ***	0,259 ***	0,136 ***
Mean age *i*	0,017 ***	-0,004	0,036	-0,021 **	0,053 ***	0,019
% youth *i*	0,076 ***	0,015	0,021	0,041 ***	0,113 ***	0,032 *
No of movers from *j*	0,458 ***	0,383 ***	0,499 ***	0,555 ***	0,493 ***	0,52 ***
Housing structure						
Difference in composition (ref: i =mixed, j = mixed)						
mixed to homogenous[1]	-0,022 ***	-0,014	-0,057 ***	-0,021 **	-0,041 ***	-0,014
homogenous to homogenous[2]	-0,023 ***	-0,015	-0,043 **	- -	-0,008	0,001
homogenous to mixed[2]	0,003	0,009	-0,024	- -	0,004	0,022
Difference in % home ownership	-0,06 ***	-0,086 ***	-0,051 *	-0,004	-0,076 ***	0,008
Difference in % rentals	-0,019 ***	0,002	-0,035	-0,027 **	-0,015	0,005
Difference in % multifamily housing	-0,03 ***	-0,055 ***	-0,071 **	-0,014	-0,026 *	-0,047 **
Socio-economic indicators						
Difference in mean age	0,009	-0,004	0,016	0,008	0,018	0,035
Difference in % youth (18-29)	-0,045 ***	-0,053 ***	-0,052 *	-0,055 ***	-0,041 **	0,004
Difference in % married	0,037 ***	0,014	0,043	0,014	0,041 *	0,033
Difference in % with children	-0,033 **	-0,043 *	-0,021	-0,036 *	-0,012	0,018
Difference in % foreign background	-0,037 ***	-0,083 ***	-0,023	-0,029 **	0,009	0,124 ***
Difference in % high education	-0,034 ***	-0,021	-0,004	-0,021 *	-0,065 ***	-0,085 ***
Difference in % employed (20-64)	-0,061 ***	-0,004	-0,019	-0,029 **	-0,035 *	-0,025
Difference in % high income earners (upper quintile)	0,001	0,007	-0,077 *	0,047 **	-0,025	-0,095 **
Difference in % low income earners (low quintile)	-0,046 ***	-0,003	-0,067 **	-0,066 ***	-0,051 ***	-0,084 ***
Difference in % social welfare recipients	0,017 ***	0,013	0,03	0,023 **	0,024 **	0,028 *
Distance indicators						
Distance in meters *ij*	-0,19 ***	-0,188 ***	-0,207 ***	-0,212 ***	-0,185 ***	-0,185 ***
Difference in distance to city centre	0,009 *	0,036 ***	0,026	-0,005	-0,008	0,011
Crossing municipal border (ref = no)	0,138 ***	0,067 ***	0,12 ***	0,199 ***	0,156 ***	0,12 ***
Change of Cluster (ref = no)	-0,009 **	0,01	-0,025	-0,017 *	-0,017 *	-0,011
No of movers *ij* 1995-2000	0,235 ***	0,265 ***	0,141 ***	0,19 ***	0,22 ***	0,193 ***
R2	.503	0,445	0,465	0,484	0,546	0,578
N	51712	11968	3366	18326	9724	4488

*** = significant at the 99.9 % level, **=significant at the 99 % level, *= significant at the 95 % level

[1] Homogenous = Ó75 % of one form of tenure, mixed = all others.

[2] No homogenous neighbourhoods are found in Cluster 3.

Divergent Moving Patterns

The third aim of the paper, after exploring and explaining moving patterns, is to find divergent moving patterns. Divergence is interpreted as *ij* pairs with high residuals. A high

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…effectively predict mobility between *i* and *j*, thus hint … housing composition, socio-economic position and distance affect moving patterns.

Most residuals are for all clusters relatively clustered around zero but there are also divergent patterns. The most extreme residuals should be of most interest, but these and many of the larger residuals are found in *ij* pairs with very few movers and thus of little interest to the analysis. This is however not the case for all large residuals. Many of the within-neighbourhood flows have large permillages, consist of a large number of movers and have high residuals, indicating that people do move within their current neighbourhood to a larger degree than they actually should if only factors of relative attractiveness, distance, and available dwellings were in charge. There are also some large residuals found between different neighbourhoods, often belonging to different clusters, indicating a moving pattern that cannot be explained completely by the above variables.

Standardized residuals for *ij* pairs where the number of movers is 50 or more and the residuals are larger than 1 (standard deviation) are shown in table 5 (flows within neighbourhoods) and 6 (flows between neighbourhoods). A comparison of the two tables gives at hand that the number of *ij* pairs fulfilling these criteria are larger when movers stay within their origin area compared to when they move to another neighbourhood, with the exception of Cluster 1 (Swedish-dominated home ownership areas) and 5 (immigrant-dense rental areas). Traditional explanatory factors are thus better at explaining moves between different neighbourhoods than why people choose to remain in the area when moving. The tables also show quite distinct differences between clusters. In relation to number of *ij* pairs, Cluster 1 has most divergent patterns. The largest residuals for within neighbourhood moves are found in Cluster 3 and 4 (Swedish-dominated mixed and rental areas) while the lowest are found in Cluster 5. This is interesting as Cluster 5 also has the highest numbers and shares of movers who move within the own neighbourhood. Apparently, the large shares of within-movers in these neighbourhoods are explained quite well by variables related to number of inhabitants in origin and available dwellings at destination, distance, housing composition and socio-economic composition. One possible explanation is that many of these areas are quite large. Moves within Tensta, well-known in Sweden as an immigrant-dense, distressed neighbourhood and thus belonging to Cluster 5, constitutes the second largest flow among all *ij* pairs with a permillage of 529. This means that more than half of those who have resided in Tensta 2000-2006 have conducted a move within the neighbourhood. One explanation for this is that Tensta is the most populated neighbourhood, thus providing better opportunities to move within the area. Another potential explanation is that people moving from the poorest cluster have fewer options when choosing their destination, due to e.g. financial limitations.

Table 5: Large Standardized Residuals per Cluster for Moves Within Neighbourhood

Moves WITHIN neighbourhood (no of movers ≥ 50, residual Ó1)					
	No of Cases	Mean Movers	Mean Inhab. *ij*	Max residual	Min residual
Cluster 1 (N=11968)	23	240	1566	2,33	1,906
Cluster 2 (N=3366)	8	734	4807	2,792	1,172
Cluster 3 (N=18326)	34	863	5096	3,886	1,031
Cluster 4 (N=9724)	23	1002	5514	3,847	1,041
Cluster 5 (N=4488)	6	1773	5486	2,255	1,133

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per Cluster for Moves Between Neighbourhoods

hbourhoods (no of movers Ó50, residual Ó1)

	No of Cases	Mean Movers	Mean Inhab. *i*	Mean Inhab. *j*	Max residual	Min residual
Cluster 1	27	95	3497	5533	2,67	1,039
Cluster 2	3	199	7514	4938	1,898	1,086
Cluster 3	23	71	4701	4274	2,164	1,062
Cluster 4	16	113	4685	3972	1,525	1,009
Cluster 5	7	95	7159	4836	1,605	1,062

I have also calculated standardized residuals when the model includes path dependence as a variable and found that these residuals are smaller in general, that the number of *ij* pairs fulfilling the above criteria is substantially lower (125 compared to 170), and that this is valid for all clusters. This is especially true for residuals of flows *between* neighbourhoods. Whereas the total number of large residuals in table 6 is 76, the equivalent number for when controlling for path dependence is only 42. Hence the flows between 34 *ij* pairs are divergent in terms of characteristics related to origin, destination or their relative attractiveness, but there has still been such a high mobility between them that the large residuals disappear when including this variable in the calculation. The change in size and number of the largest residuals when controlling for previous moving patterns indicate again that chain migration do take place even within cities, potentially affected by processes in the origin neighbourhood.

Conclusion

Residential mobility affects segregation, which in turn result a ógeography of opportunityô and neighbourhood externalities of different character. These externalities are argued to affect decision-making, and a growing literature is showing results for social mobility. Few have however tried to explicitly link these neighbourhood mechanisms back to residential mobility. If there is a connection it should affect moving patterns, supporting some flows while restricting other. The aim of this paper has been to analyze moving patterns in Stockholm in order to detect divergent patterns that cannot be explained by variables related to population, available dwellings, distance and attractiveness in terms of housing and socio-economic composition. Such findings indicate that *something else* is steering movers in these directions.

The general moving patterns in Stockholm can be described by some simple generalizations: i) the largest flows are movements within neighbourhoods ii) the largest flows between neighbourhoods go to adjacent neighbourhoods, iii) flows of any substantial size, in both number of movers and relative size of flow, are restricted to quite few neighbourhoods iv) the degree of clustering in patterns differs between types of neighbourhoods. The most clustered patterns are found when the origin area belongs to the poorest cluster. In order to be able to find divergent *ij* flows, a regression analysis has been carried out controlling for ñstandard variablesò. Results suggests that the most important factors in explaining mobility are number of people living in *i*, number of people in *j* who have conducted a move (used as a proxy for available dwellings), distance between *i* and *j* and previous mobility between *i* and *j*. These results were expected, but the last one is of extra interest in relation to the theoretical basis for the study since its large impact supports that movers from the same area follow the path of previous movers. This could at least hypothetically be related to theories about socialization processes in the origin area, i.e. that ideas about ñgoodò destinations are spread, or to social networks connecting *i* and *j*. When controlling for housing and socio-economic characteristics

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to five clusters, the same variables continued to be the e important differences between clusters. Flows from the wealthiest, Swedish-dominated areas are negatively affected by the share of population with foreign background being higher in destination than in origin, while the opposite is true for flows from the poorest, immigrant-dense areas. As for share of low-income earners, the results are negative for all clusters, meaning that flows seem to go towards somewhat wealthier areas. Interestingly, the magnitude of this variable increases for each cluster, meaning that the poorest cluster also is the one where this variable has the highest impact. Another thing implied by the models is that the largest relative flows seem to be found between areas of similar characteristics.

In order to find divergent patterns, I have analyzed residuals. Large positive residuals indicate that flows are higher than the model predicts them to be. Although most large positive residuals are found between neighbourhoods of very few movers, there are exceptions. Moves within the neighbourhood seem to be more common than the model predicts. These results are in line with the results of the RTK (1998) study, saying that the own neighbourhood was found by the Stockholm inhabitants to be the second most attractive option if moving, after the Inner City. The analysis of moving patterns shows that within-neighbourhood moves are most common in Cluster 5, the poorest cluster. The residuals for such moves in this cluster are however not exceptionally large, indicating that they can be explained quite well by the model. It is likely that differences in socio-economic characteristics and housing composition explain these moves to quite a large extent, given that the poorest part of the population also are the ones with fewest options in the housing market and thus are ñforcedò to move between areas of similar characteristics. There are also some large residuals between unique *ij* pairs, indicating clear moving patterns that cannot be explained by traditional factors. These results support that other factors need to be taken into consideration when explaining intra-city moving patterns and consequently how neighbourhoods develop in terms of population composition. The strong effect of previous moving patterns in the regressions suggests that path dependency can be found even within cities, especially between some origin-destination pairs which large residuals were explained by adding previous mobility to the model. Whether this path dependency can be explained by sociological processes within the neighbourhood of origin remains a question to be answered but the results from this study indicates that this is a possibility that needs further examination.

This paper does not try to claim that neighbourhood externalities do affect residential mobility and moving patterns; only raise the question and show the possibility. In order to move on, one must take the study down from the aggregate level, focusing on individual moves originating in the same neighbourhood. Although not discussing neighbourhood effects, there is a literature focusing on movers leaving specific neighbourhoods and where they go. Moves from poverty areas have received special attention in recent years, in Sweden (e.g. Bråmå & Andersson 1995) as elsewhere. The general result is that movers leaving such areas are likely to move within the neighbourhood and if leaving, often for a similar environment. These studies are generally part of the residential segregation literature, connecting to neighbourhood effects in the sense that leaving poverty areas is regarded beneficial as a means to escape negative externalities. Including neighbourhood externalities also as an explanatory factor would add a new dimension to these studies.

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Brown, L.A. & Moore, E.G. (1970), ñThe Intra-Urban Migration Process: A Perspectiveò, *Geografiska Annaler* B, 52:1, 1-13

Bråmå, Å. (2006),òõWhite flightõ? The production and reproduction of immigrant concentration areas in Swedish cities, 1990-2000ò, *Urban Studies* 43:7, 1127-1146

Bråmå, Å. & Andersson, R. (2005), ñWho leaves Swedenõs large housing estates?ò, in: van Kempen, R., Dekker, K., Hall, S., & Tosics, I. (eds), *Restructuring large housing estates in Europe*, Bristol: The Policy Press

Castles, S. & Miller, M.J. (2009), *The age of migration. International population movements in the modern world* (4th ed), Palgrave Macmillan

Clark, W.A.V. & Ledwith, V. (2006), ñMobility, housing stress and neighbourhood contexts: ecidence from Los Angelesò, *Environment and Planning A* 38, 1077-1093

DaVanzo, J. (1981), ñRepeat Migration, Information Costs, and Location-Specific Capitalò, *Population and Environment* 4(1), 45-73

Farley, R., Steeh, C., Krysan, M., Jackson, T. & Reeves, K. (1994), ñStereotypes and Segregation: Neighbourhood in the Detroit Areaò, *American Sociological Review* 44, 425-428

Feijten, P. & Ham, M. van (2008), ñWho wants to leave their neighbourhood? The effect of being different from the neighbourhood population on wishes to moveò, *Environment and Planning A* 40, 1151-1170

Fernandez, R.M., & Kulik, J.C. (1981), òA Multilevel Model of Life Satisfaction: Effects of Individual Characteristics and Neighborhood Compositionò, *American Sociological Review* 46, 840-850

Galster, G.C. & Killen, S.P. (1995), ñThe geography of metropolitan opportunity: A reconnaissance and conceptual frameworkò, *Housing Policy Debate* 6(1), 7-43

Ham, M. van & Clark, W.A.V. (2009), ñNeighbourhood mobility in context: household moves and changing neighbourhoods in the Netherlandsò, *Environment and Planning A* 41:6, 1442 ï 1459

Harris, D.R. (1999), ñõProperty Values Drop When Blacks Move In Becauseé õ: Racial and Socioeconomic Determinants of Neighborhood Desirabilityò, *American Sociological Review* 64, 461-479

Jones, H. (1990), *Population Geography*, London: Paul Chapman Publishing Ltd

Lee, B.A., Oropresa, R.S. & Kanan, J.W. (1994), òNeighborhood Context and Residential Mobilityò, *Demography* 31:2, 249-270

Leventhal, T. & Brooks-Gunn, J. (2000), ñThe neighbourhoods they live in: the effects of neighborhood residence on child and adolescent outcomesò, *Psychological Bulletin* 126(2), 309ï 37

Manski, C.F. (1993), ñIdentification of Endogenous Social Effects: The Reflection Problemò, *Review of Economic Studies* 60:3, 531-542

McPherson, M., Smith-Lovin, L. & Cook, J. (2001), ñBirds of a Feather: Homophily in Social Networksò, *Annual Review of Sociology* 27, 415-444

Pais, J.F., South, S. & Crowder, K. (2009) ñWhite Flight Revisited: A Multiethnic Perspective on Neighborhood Out-Migrationò, *Population Research and Policy Review* 28:3, 321-346

Quigley, J.M. & Weinberg, D.H. (1977), ñIntra-Urban Residential Mobility A Review and Synthesisò, *International Regional Science Review* 2, 41-66

Regionplane- och trafikkontoret (RTK) (1998), *Rörlighetens värde. Flyttningar i Stockholms län*, Report 1-1998

Ritchey, P.N. (1976), ñExplanations of Migrationò, *Annual Review of Sociology* 2, 363-404

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...ca, S. (2002), ñHow Do Places Matter? The Geography ... a Look Inside the Black Box of Residential Mobilityò, *Housing Studies*, 17:1, 71-82

Sampson, R., Morenoff, J., & Gannon-Rowley, T. (2002), ñAssessing óNeighborhood Effectsô: Social Processes and New Directions in Researchò, *Annual Review of Sociology* 28, 443-478

Sharkey, P. (2008), ñThe Intergenerational Transmission of Contextò, *American Journal of Sociology* 113:4, 931-969

Vartanian, T.P., Walker Buck, P. & Gleason, P. (2007), ñIntergenerational Neighborhood-Type Mobility: Examining Differences between Blacks and Whitesò, *Housing Studies* 22:5, 833-856

Zipf, G. K. (1946), ñThe P1P2/D Hypothesis on the Intercity Movement of Persons,ò *American Sociological Review* 11, 677-686