NEIGHBOURHOOD INFLUENCES ON FEAR OF CRIME AND VICTIMIZATION IN SWEDEN:

A REVIEW OF THE CRIME SURVEY LITERATURE

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Abstract

Seeking to address neighbourhood characteristics that influence individual outcomes is continuously built into public policy in a variety of policy areas. If the design of neighbourhood social interventions is informed by empirical knowledge then they may prove be more cost effective than interventions that target individuals. The adequacy of the evidence to support such interventions is however the subject of much international debate. This paper examines current criminological 'knowledge' in this area with particular reference to the accumulated knowledge base in Sweden, which has never before been assessed.

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INTRODUCTION

Along with increasing segregation in Sweden (Kölegård et al, 2007) there has been a growing academic as well as political interest in what ways individual life chances are affected by characteristics of the residential neighbourhood, so called neighbourhood effects. Living in a disadvantaged (and segregated) area is assumed to affect individual life chances negatively and foster for example fear of crime, social and physical disorder and criminality. Founded on this belief the Swedish government suggested a metropolitan policy program in an attempt to counteract the social consequences of concentrated poverty (the so called "metropolitan policy" was proposed in Sweden in 1997). The general goal was to prohibit segregation and the consequences thereof in the three largest metropolitan areas (Stockholm, Gothenburg, and Malmö). One of the more specific aims was that all parts of a city should be perceived as attractive and safe by the population and provide healthy living environments for children and adults (storstadspolitiska propositionen 1997/98:165, see also Palander, 2006). The assumed influence of neighbourhood characteristics on individual outcomes are continuously built into public policy in a variety of policy areas. The adequacy of the evidence to support this belief is however the subject of much international debate and the accumulated knowledge base in Sweden has never been assessed.

Swedish as well as international research has consistently shown fear of crime and victimization to be unequally distributed among population groups and between neighbourhoods with different levels of disadvantage. There is however an important difference to be noted when talking about neighbourhood effects. Differences between neighbourhoods may arise because certain population groups more vulnerable to fear of crime and victimization are concentrated to some areas (e.g. the elderly, women, and individuals with a lower level of socio-economic status) due to selection processes. This is called a composition effect (and is due to selective migration). These individuals would, according to a compositional explanation, feel equally afraid and be equally victimized wherever they lived, and the neighbourhood context per se would have little to do with that. Unique neighbourhood effects arise when people with the same characteristics experience different levels of fear of crime and victimization depending on where they live and not who they are (Curtis and Jones, 1998). Knowledge of what causes people to experience different levels of fear of crime and victimization risk is essential if policy makers are to make informed decisions about how to reduce fear and victimization. This knowledge is more specifically important when deciding whether to target neighbourhoods, groups of individuals, or both.

To date, the fairly limited amount of Swedish research on this policy-relevant topic provides inconclusive results when it comes to establish neighbourhood effects on fear of crime and victimization. The discrepancies in the literature may be accounted for by differences in methodological approach, level of aggregation at which the phenomenon is studied and differences in included neighbourhood characteristics and how they are measured. The same problem seems to apply to Swedish sociological research on neighbourhood effects in general (Brännström, 2008). This complicates interpretation of results and as a consequence it is difficult to get a clear picture of the empirical state of the field.

In an attempt to further our understanding of the significance of neighbourhood characteristics this paper reviews the empirical state of Swedish research. Since this is the first review of this type of research in Sweden it makes a valuable contribution to scholars as well as policy makers. The purpose is threefold. First, I provide policy makers and scholars with a summary and overview of contextual studies on victimization and fear of crime in Sweden. Based on available empirical results, I evaluate whether neighbourhood characteristics have an independent effect on individual fear of crime and victimization (i.e. the available support for neighbourhood effects) and what neighbourhood characteristics have been found to have an effect. Second, I discuss how existing research studies have dealt with common problems related to studies on the significance of neighbourhood characteristics for individual outcomes. Several reviews of international research (Baldwin, 1975; Jencks and Mayer, 1990; Galster and Killen, 1995; Ellen and Turner, 1997; Pickett and pearl, 2001; Sampson et al 2002; Sellström and Bremberg, 2006) have identified specific issues to be considered when evaluating the state of empirical research. Since a full discussion of all the methodological and theoretical problems associated with the study of neighbourhood effects is beyond the scope of this paper I have chosen to focus the assessment on[1] (a) methodological approach; (b) geographical units and level of aggregation; (c) included neighbourhood characteristics and how they are measured. Third, based on the findings, recommendations for future research are made.

A brief history of the [contextual] study of fear of crime and victimization in Sweden

Swedish criminological research on the effects of geographical contexts in general and the local neighbourhood in particular was in part spurred by the large scale "Stockholm Project" launched in 1990 as a continuation of previous research on urban crime conducted at the National Council for Crime Prevention (Brå) and the department of criminology at Stockholm University (e.g. Wikström, 1985; 1987; 1990; 1991). One of the main objectives of the Stockholm Project was to study the relationship between social and physical disorder, victimization, fear of crime, and neighbourhood social organization. The geographical units were eight larger city-parts with different residential composition and level of socio-economic resources. Overall, the results showed a connection between perceived social and physical disorder, fear of crime, victimization, and areas characterized by rented homes (Wikström, 1990)[2]. Accumulated Swedish research has shown that people experience different levels of fear and victimization risk depending on where they live and at the same time disorder and various social problems have been found to be concentrated to certain parts of a city. These environments are generally ethnically segregated, economically disadvantaged, and low in social control. These results are supported by international research (see Dolmén, 2002, for an overview of such studies).

The 1990´s saw a significant increase in the number of Swedish criminological studies using survey data in and several local victimization surveys were launched in multiple counties and cities across Sweden (e.g. Wikström et al, 1997a; 1997b; 1997c; Torstensson et al, 1998; Torstensson, 1999; Torstensson and Olander, 1999; Torstensson and Persson, 2000). This made it possible to integrate analytical levels (i.e. individual and neighbourhood or schools) by combining survey data on individuals with demographic and socio-economic data on geographical areas. The main focus of the surveys was the relationship between disorder, social control, victimization, and fear of crime in urban and rural areas. The surveys were identical to allow for comparison. Today, primarily three studies that measure fear of crime and

victimization to some extent are conducted continuously. The Swedish Crime Survey (SCS) is annually conducted by the National Council for Crime Prevention. It utilizes a nationally representative random sample of the population. The Level of Living Survey (LNU) is not primarily a victim survey but mainly measures the distribution of welfare. The sample consists of a representative sample of the Swedish population. LNU has been conducted by the Swedish Institute for Social Research (SOFI), Stockholm University, since 1968 and replicated 1974, 1981, 1991, 2000 and LNU 2010 is currently conducted. The third survey, the Survey of Living Conditions (ULF), is annually conducted since 1975 and includes questions on crime and security periodically.

The 21st century has seen an increase in the number of Swedish studies that seek to identify neighbourhood characteristics related to increased levels of fear of crime and victimization risk. Statistical innovations of the last decades have also allowed scholars to advance the study of neighbourhood effects and make more sophisticated analyses. Therefore methodology is an important part of the description of Swedish research and the time seems right to evaluate the state of the empirical field today.

METHOD

Data Sources

In order to achieve as high recall as possible and to be able to best represent the state of empirical research on the topic searches were made for peer reviewed articles published in international journals in English as well as so called "grey literature"[3] written in Swedish. Inclusion criteria for studies were: (1) study population in Sweden; (2) outcome victimization or fear of crime; (3) the geographical context, on any level of aggregation, was expected to influence fear of crime and victimization; (4) a sample of several geographical areas.

Neighbourhood effects can be difficult to prove when using large areas since the variation within these areas becomes very large. I nonetheless found it important to include studies analyzing large geographical areas in order to describe the research field correctly. Other contemporary reviews of research on neighbourhood effects have had as inclusion criterion that the studies should apply multilevel analysis (Sampson et al, 2002; Sellström and Bremberg, 2006). This was not an inclusion criterion for this review since the application of multilevel techniques is still rather limited in Sweden. Thus, this review is inclusive rather than exclusive.

Studies were identified via searches in electronic databases, special search in key journals, bibliographies of retrieved articles, and relevant organizations[4]. Because the first multilevel study in a Swedish setting was published in 2001 (Smith et al, 2001) and because this signals a new "era" through the application of new methodology in Swedish contextual research, 2001 was used as a lower bound for the selection of articles. Ecological studies up until 1996 are summarized in Wikström (1996) and I was unable to find any studies that fitted the inclusion criteria published in the period between 1996 and 2000. However, some of the articles included in this review were conducted during this period but published in 2001.

A total of 14 studies that fitted the inclusion criteria were included in the review. In one case the same study was published twice, once as a report in Swedish and once as a peer-

reviewed article (Estrada and Nilsson, 2008). In that case the latter peer-reviewed article was included in the review. One study was a comparative study between Chicago and Stockholm (Sampson and Wikström, 2008). Results are not presented for Stockholm alone but the decision was made to nonetheless include the study since it makes an important methodological contribution to victimization studies. One study is a purely descriptive study but nonetheless included since it is the only study that describes variations in fear of crime and victimization on the county level (Eriksson, 2008b). Studies on general populations were included as well as studies based on a specific segment of the population, for example single mothers.

RESULTS

Table 1 (see pages 19-21) provides information on the outcome, sample, statistical model, geographical unit, neighbourhood characteristics and main findings of the 14 studies that were identified as fitting the inclusion criteria. Three studies had results on both outcomes (Wikström and Dolmén, 2001; Dolmén, 2002; Eriksson, 2008b). All studies are cross-sectional and therefore when referring to neighbourhood effects these should be interpreted with some caution and thought of as potential effects and not causal effects.

Eight studies investigated the effects of neighbourhood factors on what is referred to as the umbrella concept fear of crime[5] (Wikström and Dolmén, 2001; Smith et al, 2001; Dolmén, 2002; Lindström et al, 2003; Lindström et al, 2006; Eriksson, 2008a; 2008b; Mellgren et al, 2011).

Ten studies investigated the effects of contextual factors on violent and property related victimization (Wikström and Dolmén, 2001; Wikström and Wikström, 2001; Dolmén 2002; Estrada and Nilsson, 2004; 2007; 2008; Larsson, 2006; Nilsson and Estrada, 2007; Sampson and Wikström, 2008; Eriksson, 2008b).

Next the included studies are discussed based on (a) methodological approach; (b) geographical units and level of aggregation; (c) included neighbourhood characteristics and how they are measured. As expected, the degree of variability between studies was found to be substantive.

Methodological approach

The main objective of research on neighbourhood effects is to determine if characteristics of residential neighbourhoods (or other geographical areas) have unique effects on individual life chances that cannot be attributed to personal background characteristics. Traditionally, in Sweden as well as internationally, questions like these have been investigated in single-level models, either at the aggregate level (also referred to as ecological studies) or at the individual level. In these models data on individuals as well as data representing context is measured at the same level. These models have been criticized for not taking into account the nested structure of the data, being unable to separate the impact of context from the impact of the individual and therefore inadequate to analyze geographical differences in individual outcomes (Merlo et al, 2001). Nonetheless this approach is (still) frequently used. Methodological advancements, more

specifically the development of random coefficient models, more commonly and henceforth referred to as multilevel analysis/models, have made it methodologically possible to simultaneously analyze data from different levels (e.g. individual and neighbourhoods or schools). Multilevel models are explicitly concerned with detecting contextual influences of hierarchical structures on behavioral and attitudinal outcomes at lower levels, and with distinguishing true contextual effects from compositional effects, or consequences of segregation or selection (Snijders and Bosker, 2004). As such it is possible to determine whether there are effects of a higher level on an individual outcome controlling for characteristics of the individual. Multilevel analysis has been acknowledged as the accurate framework for modeling contextual effects (Miethe and McDowell, 1993; Johnson, 2010) and important for improving our understanding of different social phenomena. Indeed, the number of studies with a multilevel approach is on a steady increase, with a majority originating from the United States and Britain. In multilevel analysis, the coefficient that gives information about how much of the observed variance at level one that is situated at the higher level is called the intraclass correlation coefficient (ICC). The ICC is "equal to the correlation between values of two randomly drawn micro-units in the same, randomly drawn, macro-units (Snijders & Boskers, 1999, p 17). An ICC of 10 percent means that 10 percent of the variance can be found between the higher level units, e.g. at the neighbourhood level. The ICC is initially calculated in a so called empty model with no controls.[6]

Even though the number of Swedish studies that apply multilevel analysis has grown since the first study was published in 2001 (Smith et al, 2001) many studies approach the issue of the role of the neighbourhood by adding neighbourhood level variables to an individual level model. Table 1 demonstrates that the included studies have used different types of statistical models. The different methodological approaches are one possible explanation to the divergent results. An often cited reason for the limited use of multilevel analysis is that the available data material does not allow for multilevel analysis. In the studies where this was the case, two specific problems were identified. Either it was not possible to link the individual to a unique area (Estrada and Nilsson, 2004; Larsson, 2006) or the number of individuals per area included in the survey are too few to make reliable estimates of social processes at the neighbourhood level (Estrada and Nilsson, 2007; 2008;). Raudenbush and Sampson (1999) recommend a net sample size of 25-30 respondents per neighbourhood unit to maximize the ecological reliability. They also found that having more than 40 respondents per area did not add significant improvement of ecological reliability (Raudenbush and Sampson, 1999). Among the studies in this review that utilized multilevel analysis, one included as few as 5 respondents per area (Sampson and Wikström, 2008). The number of respondents per area ranged from 1-29 in Estrada and Nilsson's study (2008) with an average of 2.3. Smith et al (2001) used 20 as a lower bound in most cases, others used 20 (Lindström et al, 2003; Mellgren et al, 2011) and Eriksson (2008a) included an average of 38 respondents per unit. The mentioned studies analyze rather small geographical units compared to Lindström et al (2006) who studied municipalities and city quarters. They were able to include 200-250 respondents per area. Small samples of individuals per unit may lead to underestimation of the effect of neighbourhood characteristics (Sellström and Bremberg, 2006). Thus some of the results in the included studies should be interpreted with care. Of course this is also dependent on what neighbourhood characteristics are studied and how the measures are constructed. In general, measures based on an aggregate of survey responses are

most sensitive to bias stemming from few respondents per unit. Administrative data do not have these limitations since it is based on a total of the population. Also, if too few second level units are analyzed it can be difficult to detect between neighbourhood variance (Duncan et al, 1998). The smallest number of level-two units analyzed in the included studies is 8 (Wikström and Wikström, 2001) and 41 (Smith et al, 2001).

Multilevel analysis has been found to produce different results from single-level (O'Campo et al, 1995). This mainly poses a problem when trying to establish the state of empirical evidence of neighbourhood effects on victimization outcomes (e.g. Sellström and Bremberg, 2006). Nine out of the ten studies on victimization were single-level and only one of the studies included in this review applied multilevel analysis (Sampson and Wikström, 2008). Previous research on the risk of burglary victimization and violent victimization has shown that multilevel models with contextual predictors offers a better prediction of victimization risk compared to models that only includes individual-level variables (Miethe and McDowell, 1993). Miethe and McDowell (1993) also found that the inclusion of contextual factors altered the importance of individual-level characteristics. None of the studies on victimization report ICCs. The methodological approach in fear of crime studies is more consistent across studies. Five out of the eight studies on fear of crime utilized multilevel models. The studies with a multilevel methodological approach all find unique neighbourhood effects even after considering individual background characteristics. The rather modest amount of variance between neighbourhoods ranges from 4.3% to 21.2% in the empty models and are successively smaller as individual and neighbourhood variables are introduced into the equations. The differences in the amount of variance found at the higher level might be explained by different operationalisations of the outcomes and different geographical sizes of the units of analysis.

The unit of analysis and level of aggregation in contextual studies
All studies in this review, as well as a majority of international studies, rely on administratively defined areas (Oberwittler and Wikström, 2009). Sweden has several administrative classifications of areas of different sizes with varying purposes and degree of political autonomy. Practical reasons often guide the choice of contextual units since administratively defined areas provide an opportunity to easily link area level data to individuals. The most common unit in regional statistics is counties. Sweden is divided in 21 counties which vary significantly in areal size and population size. The next level hierarchically is the municipality. Sweden has 290 municipalities with extensive political autonomy over its region (in the European Union the corresponding unit is Local Area Unit 2). The municipalities are responsible for providing schooling and child care to mention but a few areas of responsibility. Each municipality divides the region into city quarters and neighbourhoods of varying sizes for administrative and statistical purposes. Sweden is also divided in SAMS-areas (9200) which are homogenous areas with approximately 1000 inhabitants per area. SAMS-areas are not used in official statistics (Statistics Sweden, 2005) but often in research. Please refer to table 1 for an overview of the areal units utilized in the included studies.

It is important to pay attention to the different units of analysis, their sizes and characteristics, for several reasons. It is probably so that individual, contextual, political, and cultural factors have different meanings depending on the level of aggregation at which they are

analyzed (Subramanian et al, 2003). Also, some theories may be apt to test at a certain level of aggregation and others at different levels (Ouimet, 2000). In one study the city-level was even found to be a more predictive social context for juvenile delinquency than the neighbourhood-level (Weijters et al, 2007). None of the studies included in this review analyses the influence of the same variables on different levels of aggregation and therefore little is known about how predictors act on different levels of analysis in Swedish settings. For example, social cohesion may be suitable to measure at the smaller neighbourhood level but not at the regional level due to the theoretical meaning of the concept as a social process going on between neighbours or people in the same neighbourhood (Sampson et al, 1997). An empirical example that can illustrate the different meaning of variables at different levels of analysis is the two studies by Lindström et al (2003) and Lindström et al (2006) included in this review. In the former study individual sense of security can be partly explained by neighbourhood level social capital. In the latter study (Lindström et al, 2006) the same outcome is studied but at the municipality level[7] (city parts of larger municipalities are also included). Social capital (defined identically as electoral participation rate) is not significantly related to individual sense of security at this level but instead the variable administrative police district (indicating differences in strategy, management, policy and administrative routines between police districts) is the best contextual predictor. This suggests that social capital is important at the neighbourhood level but not as a predictor at the municipality level. But, since some variance is lost because of the aggregation this is not surprising. The case where different results are produced depending on the level of aggregation on which the phenomenon is studied is called the "aggregation effect" (Oberwittler and Wikström, 2009) or the "modifiable area unit problem" (Ratcliffe and McCullagh, 1999) and can be more or less pronounced depending on what is being studied (Burgess et al, 2001).

Municipalities are an important area classification from a political and policy point of view since it is the lowest level of political autonomy. However, from a theoretical point of view when studying social mechanisms and neighbourhood structural characteristics it has some weaknesses. Municipalities vary significantly in geographical size and population size and thus using the unit municipality means using several different units regarding geographical size and population size. Swedish municipalities vary from 0.25 inhabitants per square kilometer to 4058 inhabitants per square kilometer (Statistics Sweden, 2005). Furthermore, 85 per cent of the Swedish population inhabits 1.3 per cent of the total land areal (Statistics Sweden, 2005). Thus the mean values of regional statistics represent areas with significant differences in areal size and population. Research on neighbourhood effects in general has been criticized for using too large units and for operating "…with a very weak concept of neighbourhood" (Lupton, 2003:3-4). Lupton goes on to say that because of this "its [neighbourhood effects research] findings are in some cases almost meaningless and possibly misleading" (Lupton, 2003:4, comment in brackets is the authors). In a recent study Oberwittler and Wikström (2009) shows that smaller units has the advantages of being homogenous and that people's perception of an environment is more concurrent in a smaller area.[8] This results in a higher ecological reliability as well as scale reliability of variables based on survey responses. Another advantage discovered with using smaller areas is the increase in statistical power for detecting contextual effects (Oberwittler and Wikström, 2009). Too large units might thus obscure contextual effects. Block and Block (1995) have also argued that that there is a risk of drawing the wrong conclusions about patterns of crime when using large, heterogeneous areas and risk a so called reversed ecological fallacy.

Eriksson (2008b) described differences in levels of fear and victimization across Swedish counties. These areas are large and most likely masks within area variation as the characteristics of highly and poorly resourced areas evens out when means are calculated. On the other hand, using too homogenous areas risk heavily underestimating contextual effects. This might be the case with studies where the areas analyzed are grouped together based on level of resource deficiencies (Estrada and Nilsson, 2007; 2008).

Neighbourhood characteristics: how are they measured and which matter?

The reviewed studies consider a wide range of so-called neighbourhood characteristics. Scholars have attempted to measure context in two different ways: either as aggregated variables based on individual responses to social surveys or as structural characteristics of the neighbourhood based on administrative data. The latter is often used to form indices of resource deficiencies and the former to measure neighbourhood level social processes, such as social control and social and physical disorder. Administrative data are highly accessible in Sweden through Statistics Sweden and reliable at multiple levels of aggregation. Although administrative data does not allow for a direct measure of social processes such as social control, classic social [dis]organisation variables are in some cases used as proxies for such processes.

Several studies have attended to structural characteristics of areas measured by administrative data, either as single indicators or composite indices. Structural characteristics include the demographic composition of an area, area distribution of economic resources, population density, mobility, ethnic heterogeneity, and infrastructural environment such as land use and housing type. Composite measures have the advantage of avoiding multicollinearity between variables and the disadvantage of obscuring the individual influence of variables (Pickett and Pearl, 2001). In the studies that use several indicators of disadvantage it is therefore not possible to discriminate between the effects of different variables. The most common approach in the reviewed studies is to treat the structural characteristics of neighbourhoods as proxies for social mechanisms at the neighbourhood level, i.e., the socio-economic structure of a neighbourhood is considered to affect fear of crime and victimization indirectly through its impact on neighbourhood level social processes. Although the evidence for unique effects of neighbourhood level disadvantage after controlling for individual characteristics is weak and individual characteristics seem to have the most decisive influence on fear of crime and victimization risk, taken together the studies indicate that neighbourhood level disadvantage is indirectly linked to higher levels of fear and victimization.

Social mechanisms that refer to collective aspects of life in the neighbourhood and that are seen as the mechanisms delivering neighbourhood effects are investigated to a lesser extent in the reviewed studies. Though, the significance of such variables is recognized (e.g. Eriksson, 2008a:30). Both survey data and administrative data have been used to measure social processes. Key informants (Pauwels and Hardyns, 2009) and systematic social observation (Sampson and Raudenbush, 1999) have been proposed as ecologically reliable alternatives but are yet to be tested in a Swedish setting. Social processes attended to in the studies include social capital, social integration, collective efficacy, social control, and social and physical disorder.

Three studies examine the relation between neighbourhood social capital and fear of crime. At the neighbourhood-level (Lindström et al, 2003) and at the SAMS-level (Eriksson, 2008a) significant effects of neighbourhood social capital on individual fear of crime was found but this relation is not confirmed at higher levels of aggregation (Lindström et al, 2006).

One study measure perceived disorder, based on survey data, at the neighbourhood level (Mellgren et al, 2011). The use of averages of individual level measures has been the subject of criticism in multilevel studies, although such measures have been used in several contemporary studies of contextual influences on individual fear (e.g. Wyant, 2008). Average perceived neighbourhood level social and physical disorder was found to influence individual fear of crime even after individual characteristics had been considered. In line with these results, although measured at the individual level, Wikström and Dolmén (2001) and Dolmén (2002) found survey measured perceived neighbourhood disorder to influence fear of crime and victimization. Further support for the significance of social processes for victimization is offered by Sampson and Wikström (2008) who found victimization to be more frequent in unstable, disadvantage neighbourhoods low in collective efficacy. Collective efficacy, as developed by Sampson et al (1997), and social capital share important features and are often operationalised with the same components, such as the extent to which neighbours trust and help each other (Kruger et al, 2007). According to Putman social capital can be defined as "features of social organization, such as networks, norms, and trust that facilitate coordination and cooperation for mutual benefit" (Putnam, 1993:369). According to this definition it can be understood as a resource that can be realised in an area through a collective effort of the residents. The concept of "collective efficacy" is distinct from social capital in the way that where social capital is based on ties between neighbours and the presence of organizations, collective efficacy is the process where these ties are activated to perform a specific task and achieve a specific goal (e.g a safe community environment). In Sampson et al´s (1999) view, neighbourhood ties per se are not important unless they are activated to perform a specific task. In an attempt to explain the so called gender gap in fear of crime Smith et al (2001) examined perceived risk and fear of assault. The analyses showed that women are more sensitive to the surrounding environment than are men. Social integration in the area was one social factor found to significantly affect women. The authors conclude that "…men 'personalize' risk and fear, based on their own status, while women 'ecologize' risk and fear" (Smith et al, 2001: 178).

Another group of studies measure the level of crime risk in a neighbourhood. Using various indicators, such as but not limited to, perception of neighbourhood level of problems (Estrada and Nilsson, 2004) and living in areas dominated by non-profit housing (Wikström and Wikström, 2001) findings point to the significance of a "risky neighbourhood" for individual fear of crime and victimization.

The conclusions drawn from the literature on fear of crime are very much in line with the international literature identifying social control, social integration and social and physical disorder as important mechanisms linking fear of crime to geographical contexts (see Dolmén, 2002, for a review of international research). When it comes to victimization outcomes neighbourhood characteristics seem to play a more decisive role in the distribution of property crime compared to violent victimization. Individual lifestyle indicators are more important for violent victimization and the neighbourhoods' socio-demographic make-up matter more for

property related crimes. However, given the fact that the literature is still rather sparse, there are not enough studies using the same outcome, neighbourhood characteristics, control variables and study design to draw any exact conclusions on the magnitude of neighbourhood effects and what characteristics are most important. The choice of neighbourhood level variables seems to be driven by accessibility rather than the theoretically proposed causal pathways.

DISCUSSION

This paper has attempted to review and summarize the results from Swedish research on the significance of neighbourhood characteristics for individual fear of crime and victimization. In doing so, critical empirical gaps have been identified. The intention of this last section is to discuss the most important findings and to turn the weaknesses of existing research into recommendations which will provide a starting point for future work in this area in Sweden.   It is my impression that the study of contextual influence in Sweden has evolved both theoretically and methodologically since Wikströms (1996) summary of research in the 1990´s. Studies in this review consistently find fear of crime and victimization to be unequally distributed across population groups and across geographical areas. This is an important finding in its own right. When unique neighbourhood effects are found they are generally modest and significantly smaller than compositional effects. However, findings offer an inconsistent and incomplete answer to the question of neighbourhood effects and thus offer little guidance for policy makers. Heterogeneity in methodological approach, level of aggregation, and included neighbourhood characteristics and how they are measured or indeed, created, are identified as significant obstacles to drawing conclusions. We should however not forget that the research tradition in Sweden is relatively young and is still developing both theoretically and methodologically.

It is possible; on the one hand, that Sweden is too homogenous to show clear neighbourhood effects. Also, contextual theory has to a large extent been developed first and foremost based on data on U.S. settings. There is a potential danger in relying too much on international findings. International comparisons indicate that the neighbourhood context may play a less significant role in explaining individual differences in Sweden[9]. Also, in international comparisons, fear of crime levels and crime levels are low in Sweden (van Kesteren, et al, 2000; van Dijk et al, 2007). This highlights the importance of local investigations of local problems. A relevant hypothesis is that neighbourhood effects on fear of crime and victimization are dependent of broader structural conditions in the societies in which area differences are studied. This could explain why some area effects are less pronounced in countries like Sweden, where social class differences and segregation are less evident compared to the U.S. (Sampson and Wikström, 2008) and the general standard of living is high.

On the other hand, Sampson and Wikström (2008) found the distribution of crime to be related to similar factors in Chicago and Stockholm. Moreover, segregation seems to be on the increase in larger Swedish cities (Nordström et al, 2010). Also, increased immigration and residential segregation has led to the development of multi-problem neighbourhoods (Wikström, 1996) and people living in disadvantaged areas more frequently worry about crime and their risk of victimization is higher (SOU 1997:96).

Moving forward: recommendations for the future

How then can the field advance to provide a solid knowledge base regarding the role of the neighbourhood for individual fear of crime and victimization, as well as other health-related problems? Specifically, the following priorities for future research are suggested.

A further emphasis on social mechanisms is needed. A number of studies show that there are variations that cannot be ascribed to characteristics of the individual. While theory recognizes social mechanisms at the neighbourhood level as the variables delivering neighbourhood effects only a few have attempted, or had the prerequisites, to explain how context works to affect individual outcomes. Most studies include structural characteristics and those do not say anything about the actual mechanisms responsible for independent neighbourhood effects. If the results are going to be employed in policy discussions the active mechanisms need to be identified. I suggest that future research focus explicitly on identifying mechanisms.

Second, efforts to study cross-level interaction should be increased, i.e. the possibility that context has different meanings for people with different individual characteristics. Once we have established if there are neighbourhood effects on the population as a whole it seems as a natural step to identify subgroups for which the effect of living in a certain neighbourhood is larger than other population groups. For example, Eriksson (2008 a) indicates that immigrants in disadvantage areas are more fearful than their native counterpart. Women and men also seem to be differently affected by the surrounding geographical context, as illustrated by Smith et al (2001). This indicates the need for interventions to be gender specific to some degree.

An issue of much theoretical and methodological importance that has not been discussed in this paper is the problem of self selection. If for example low socio-economic status is both causative of people residing in certain areas and makes them more fearful then individual socio-economic status must be included in the model or otherwise neighbourhood effects may be overestimated. This is particularly problematic in cross-sectional studies and highlights the need for longitudinal studies to be able to make causal inferences.[10]

There is a need for comprehensive data materials that allow for more sophisticated data analysis. This review shows that a limited number of data sources dominate Swedish research on neighbourhood context, victimization, and fear of crime. As such these materials play a significant role in the direction of research since included themes and survey questions consequently determines what is possible to investigate. Quantitative research on fear of crime and victimization of the kind reviewed here is also limited to a few scholars and research institutions. Heber (2005) notes a development in Sweden where research on fear of crime and crime victims is growingly carried out by private companies and authorities instead of research institutes. Examples are the Swedish Crime Survey (SCS) carried out by the National Council for Crime Prevention (Brå) and the annual Survey of Living Conditions (ULF) produced by Statistics Sweden. These surveys are not constructed first and foremost for research purposes but to supply statistics for official use. This can explain the general nature of such surveys.

Many of the limitations that face the studies included in this review were found to stem from restrictions coming from poor data. First, few data materials provide an opportunity to link

individuals and neighbourhoods. This automatically rules out the possibility of using multilevel modelling and is common in studies based on nationally representative samples of the population. A second problem with nationally representative samples is too few respondents per areal unit to get ecologically reliable measures and as a consequence multilevel analysis is seldom performed.

Not only the within-area samples have to be large enough but the survey instruments need to be comprehensive enough to be able to construct theoretically relevant and ecologically reliable contextual variables. Studies often fail to measure theoretically relevant concepts due to lack of data. As an example, neither the annual Survey of Living Conditions (ULF) nor the Level of Living Survey (LNU) are primarily victim surveys and do not include questions on social processes in the neighbourhood, such as social control, relevant for a contextual perspective on fear of crime and victimization. The Swedish Crime Survey (SCS) on the other hand is a national annual investigation of how the population experience crime and crime-related problems. However, it does not include a majority of variables recognized as important for fear of crime and victimization (e.g. disorder, social integration, social control, perceptions of the neighbourhood). The local victim surveys developed within the Stockholm Project were especially designed to measure social processes in the neighbourhood but are no longer carried out in their original form.

Surveys with a multilevel sampling design with local data on social processes in appropriately defined areas should be routinely collected and linked to various health-related problems. This would also allow for longitudinal analysis of dynamics of change, something that is missing today. Static models risks making similar miscalculations as single-level models in the way that they miss the influence of development on individual outcomes (Sampson et al, 2002). Thus we know nothing about how enduring neighbourhood effects are. It is positive though that the Swedish Crime Survey (SCS) is annually conducted and now also allows for linking individuals to areas. Thus there is potential for longitudinal analysis in the future. As an example on what can be achieved regarding the appropriateness of geographical units Chaix et al (2006) constructed neighbourhoods as buffer zones based on geographical coordinates. This is now possible using Geographic Information Systems and should be considered when designing research projects. Although the expenses related to such an operation are recognized it might be that such efforts are needed in order for the research field to advance. This would also provide an opportunity to identify "hot spots" of social problems and for interventions to target smaller areas.

Finally, it is possible that there are neighbourhood effects on fear of crime but not on victimization in Swedish settings. This review has highlighted that there is a paucity of multilevel studies on victimization that might explain the different results. It is possible that studies that make use of multilevel models produce different results regarding the existence of contextual effects compared to single-level studies (Johnson, 2010). However, it takes more studies, especially on victimization outcomes, to confirm this hypothesis.

From a policy perspective these suggested priorities for future work are essential if interventions are to be designed based on empirical knowledge. Sampson (2008) suggests that neighbourhood level interventions (if neighbourhood effects are found to be significant) may be

more cost effective than interventions that target individuals. However, surprisingly few of the studies include recommendations for policy makers. This lessens the usability of results in policy decisions and further highlights the empirical gaps in the literature.

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Table 1. Summary of reviewed studies.

Reference	Outcome (s)	Sample (year)	Type of model	Unit of analysis (range or average stated size)	Neighbourhood factor (s)	Association between neighbourhood factors and individual outcome
Smith, Torstensson & Johansson (2001)	Fear of crime, perceived risk	Survey of Stockholm, N= 3882 (1994)	Multilevel regression model	Community police districts, N=41	Ethnic mix, low socio-economic status, residential stability, lack of social integration, congregation of publicly managed rental units, suburban/urban (aggregated from survey data).	Neighbourhood factors more important for women than men. Higher levels of fear and risk in socially disorganized neighbourhoods low in social integration. ICC*: 12.1% and 11.8% of the variation in fear of assault was between police districts for women and men respectively. For risk perception the corresponding effect size was 21.2% and 15.6% for women and med respectively
Wikström & Dolmén (2001)	Fear of crime, victimization	Two regional surveys (Gävleborg and Stockholm), N=7059 (1996)	Single level linear regression	Neighbourhoods, N=324	Social integration, informal social control, minor social disorders.	Urbanization was linked to fear of crime through its impact on the level of informal social control and to victimization largely through its impact on neighbourhood level disorder. They further found that the intervening mechanism linking disorder to fear of crime and victimization was the level of social integration and informal social control.
Wikström & Wikström (2001)	Threats of violence	Stockholm Project Interviews, N=1498. Single parents (1992)	Single level linear regression	City parts, N=8.	Ecological risk.	The interaction between a risky lifestyle and living in non-profit housing means higher risk of victimization.

*Refer to ICC in empty models.

Table 1. Continued.

Reference	Outcome (s)	Sample	Type of model	Unit of analysis (range or average stated size)	Neighbourhood factor (s)	Association between neighbourhood factors and individual outcome
Dolmén (2002)	Fear of crime, victimization	Survey of Stockholm, N=3985 (1995)	Single linear regression	Classification of neighbourhoods by degree of urbanisation and dominating housing type.	Socio-economic structure, mobility, social integration and social control.	Geographical variations in fear of crime were linked to neighbourhood socio-economic situation and level of social control. In separate analyses of worry about violent crime and property crime social disorder was correlated to both outcomes separately, although the correlation between worry about violent crime and social disorder was higher. Violent victimization risk is primarily a function of individual lifestyle. Risk of property crime is higher in disadvantaged and disorderly areas.
Lindström, et al. (2003)	Sense of insecurity	Public Health Survey in Malmö, N=5422 (1994)	Multilevel regression model	City parts/neighbourhoods, N=68.	Social capital.	Higher sense of insecurity in neighbourhoods low in social capital. ICC*=7.2%.
Estrada & Nilsson (2004)	Threat, violent victimization	Annual Survey of Living Condition. N=1713 single mothers (1988-1999)	Single level linear regression	-	High risk neighbourhood.	Neighbourhood factors have no unique significant effects on victimization.
Larsson (2006)	Exposure to property crime	ULF, N=5732 (1998)	Single level linear regression	-	High risk neighbourhood.	Exposure to vehicle crimes were more common among poor but the higher risk was related to individual background rather than the neighbourhood of residence or poverty per se.
Lindström et al (2006)	Sense of insecurity	The Public Health Survey in Scania, N=13715 (2000)	Multilevel regression model	Municipalities/city quarters, N= 60 (municipalities: 6808-257,574).	Social capital and administrative police district.	Differences in strategy, management, policy and administrative routines between police districts affects individual sense of security. ICC*=4.3%.

*Refer to ICC in empty models.

Table 1. Continued.

Reference	Outcome (s)	Sample	Type of model	Unit of analysis (range or average stated size)	Neighbourhood factor (s)	Association between neighbourhood factors and individual outcome
Nilsson & Estrada (2007)	Violent victimization	Annual Survey of Living Conditions, N=7739. National sample (2006+2007)	Single level logistic regression	SAMS, N=3288 (average population of 1550, average area of 8 km2)	Resource deficiencies.	Higher risk of victimization among those classified as living in the poorest resourced neighbourhoods but after controls are included for individual and household factors no significant neighbourhood effects remain.
Eriksson (2008a)	Fear of crime	Swedish Crime Survey, N=12006, national sample (2006+2007)	Multilevel regression model	SAMS, N=2 935 (1000)	Social capital.	Neighbourhoods low in social capital experience higher levels of fear of crime. ICC*=6.1%.
Eriksson (2008b)	Fear of crime, victimization	Swedish Crime Survey, N=14945 (2006+2007)	Descriptive, ecological	Counties, N=21	-	Significant regional differences in levels of fear of crime and victimization.
Estrada & Nilsson (2004)	Threat, violent victimization	Annual Survey of Living Conditions, N=1713 single mothers (1998-1999)	Single level linear regression	-	High risk neighbourhood.	Neighbourhood factors have no unique significant effects on victimization.
Sampson & Wikström (2008)	Violent victimization	Survey, Chicago and Stockholm N=9121 (1995/1996)	Multilevel logistic regression model	Pooled sample of Chicago neighbourhoods and Stockholm neighbourhoods, N=541 (average population 5000)	Collective efficacy, instability, disadvantage.	Violent victimization in the residential neighbourhood was higher in neighbourhoods with high instability, disadvantage, and low in collective efficacy. ICC not reported.
Mellgren et.al (2011)	Worry about victimization	Malmö Fear of Crime Survey (1998)	Multilevel regression model	Neighbourhood clusters, N=79.	Neighbourhood social and physical disorder.	Individuals experience more fear of crime in disorderly neighbourhoods. ICC*=65.7%

*Refer to ICC in empty models.

[1] The readers are referred to the mentioned reviews of international research for a more elaborate discussion on various methodological and theoretical problems associated with neighbourhood effects research.

[2] For a summary of the different smaller projects included in the project and their results see Wikström, 1990.

[3] Grey literature refers to papers, reports, or other documents produced and published by governmental agencies, academic institutions and other groups that are not distributed or indexed by commercial publishers. These documents may be difficult to locate and obtain. I searched for grey-literature in bibliographies, research institutions and Swedish library catalogues.

[4] Database searches were made in Bibliography of Nordic Criminology (database maintained by Scandinavian Research Council of Criminology), Sociological abstracts, PubMed, ISI web of science, and academic search elite (ebsco). I also searched the journal of Scandinavian studies in criminology and crime prevention issue by issue since this is a key platform for research based on Nordic experiences. Journals were searched from their inception until June 2010. For the data base search we used the following keywords: Fear of crime OR Crime OR Victimization AND Neighbourhood OR Context OR Multilevel OR Environment OR Community OR Ecology AND Sweden.

[5] A full discussion on different aspects of the concept fear of crime is beyond the scope of this paper. We refer the readers to Heber (2005) and Vanderveen (2006) for elaborated discussions on fear of crime.

[6] For a more elaborate discussion on multilevel models in general and ICC in particular we recommend the reader to Snijders and Bosker (2004).

[7] Population size in the included municipalities varies from 6808 to 257 574.

[8] The higher homogeneity of smaller areas was pointed out already by Harvey Zorbaugh in his Phd study from 1929 (see Weisburd et al, 2009 p 13).

[9] Studies in the U.S and Canada have found contextual effects on fear of crime of about 12 percent (Wyant 2008; Fitzgerald 2008) and 11 percent (Taylor 1997).

[10] For a further discussion on selection bias the readers are referred to Sampson and Sharkey (2008).