COLLECTIVE EFFICACY, DEPRIVATION AND VIOLENCE IN LONDON

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Abstract

This paper examines the importance of neighbourhood context in explaining violence in London. Exploring in a new context Sampson's work on the relationship between interdependent spatial patterns of concentrated disadvantage and crime, we assess whether collective efficacy (i.e. shared expectations about norms, values and goals, as well as the ability of members of the community to realise these goals) mediates any potential impact on violence of neighbourhood deprivation, residential stability and population heterogeneity. Reporting findings from a dataset based on face-to-face interviews of 60,000 individuals living in 4,700 London neighbourhoods, we find that collective efficacy is negatively related to police recorded violence. But unlike previous research, we find that collective efficacy does not mediate the statistical relationship between structural characteristics of the neighbourhood and violence. After finding that collective efficacy is unrelated to an alternative measure of neighbourhood violence, we discuss limitations and possible explanations for our results, before setting out plans for further research.

Keywords: collective efficacy; violence; social disorganisation theory; social disadvantage.

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Introduction

Sampson's (2012) recent book, *Great American City: Chicago and the Enduring Neighborhood Effect,* is a powerful restatement of the importance of place in social patterning and stratification. The argument is that '…virtually all social life is interdependent in underappreciated spatial forms—"things go together" in and across distinct places.' (Sampson, 2012: 379). If analyses of social life and social conditions are to be complete, he reasons, they need to consider not only individual-level determinants, but place-level characteristics that can have causal effects which are irreducible to individual phenomena.

One aspect of Sampson's work that has generated enduring interest across the social sciences is his investigation of the spatial patterning of violence across Chicago. In a series of papers (Sampson *et al.,* 1997; 1999; 2002), which that have since been built upon through a number of re-analyses of the same data (e.g. Browning et al., 2004), he has shown that neighbourhoods characterised by deprived social and economic conditions are limited in their ability to control or supervise behaviour (primarily that of young people). He also shows that the statistical effects of concentrated disadvantage, residential stability and population heterogeneity on violence (and perceived violence) are partly mediated by 'collective efficacy', i.e. shared values and shared propensities for action. First, particular patterns of social and economic life shape the extent to which neighbourhoods develop shared dispositions to feel and act, fostering social control and cohesion. Second, significant variation in these shared propensities to act on behalf of the collective good, which is then related to levels of violence, as well as people's perceptions of violence in their locality. Aspects of this framework have since been explored in a variety of cities, including Belo Horizonte, Brazil (Villareal and Silva, 2006); Brisbane, Australia (Mazerolle et al., 2010); Freiberg, Germany (Oberwittler, 2001); Indianapolis, Rochester, Tampa-St. Petersburg, and St. Louis, USA (Veléz, 2001); Medellín, Colombia (Cerdá et al., 2012); Mesa, USA (Armstrong et al., 2010); Stockholm, Sweden (Sampson and Wikström, 2008); Tianjin, China (Zhang et al., 2007), as well as nationally in Britain (Lowenkamp et al., 2003; Odgers et al., 2009; Sampson and Groves, 1989).

The two central questions driving this paper are '*What are the individual and structural determinants of collective efficacy in London?*' and '*Does collective efficacy have the same relationship to social disadvantage and crime as in other cities?*'. We proceed as follows. After a brief review of the theoretical background to the paper, we discuss the research setting and outline the various sources of data used. Following a discussion of a series of multilevel statistical models that examine the correlates of collective efficacy, we then present results from a series of ecological models that examine the area-level relationship between structural disadvantage, collective efficacy and crime. Fitted models are discussed and limitations of the study are reviewed, before closing with a discussion on areas for further development.

This paper adds to the criminological literature on the spatial patterning of violent literature by examining whether Sampson's model of social and spatial context is 'portable' to the UK's

capital city, London. Investigating the link between structural characteristics of place (the social and economic conditions that vary across neighbourhood) and violence, and examining whether collective efficacy acts as a statistical mediator between structural characteristics of the neighbourhood and violence, our empirical strategy (i) uses small-area geographical units, (ii) has independent measures of neighbourhood quality, and (iii) combines both survey and routinely collected administrative data to create a unique and powerful dataset.

Social disorganisation theory

Although it has a long and distinguished history, starting with Park and Burgess (1924), Thrasher (1927) and Shaw and McKay (1942), the rise of psychological approaches to understanding criminal behaviour led to a waning interest in social disorganisation until the late 20th Century (Bursik, 1988). William J. Wilson's (1987) US work is widely credited as the spark for a resurgent interest in understanding the influence of 'context' amongst academic criminologists, social commentators and the public alike, with MacLeod (1987) writing in a similar vein.

In parallel, the work of Robert J. Sampson and colleagues (*inter alia* Sampson, 1987; Sampson and Groves, 1989; Sampson et al., 1997; 1999; 2002), as well as the review by Bursik (1988) brought social disorganisation theory – and ecological theories more broadly – back to the forefront of sociological and criminological thinking. A key argument of Sampson and Groves (1989) – and a central motivation for their focus on social disorganisation – was that Shaw and McKay's arguments relating to concentrated disadvantage, residential stability and population heterogeneity had been fundamentally misunderstood (Akers and Sellers, 2009). Sampson and Groves (1989) argued that residential instability (for example) should not be regarded as a direct cause of crime, but as something which 'fosters institutional disruption and weakened social controls' (Sampson et al., 1997: 919).[1] Similarly, it is through a lack of contact and the erosion of trust in neighbours that population heterogeneity causes criminal behaviour (Sampson et al., 2005).[2] Population density (see Sampson, 1987) is often assumed to capture the effect of rapid depopulation associated with deprived neighbourhoods in the US and/or reduced opportunities for interpersonal crime to occur (Browning et al., 2004) and has been found to be negatively correlated with homicide (Morenoff et al., 2001). 'Family disruption' (lone parenthood) was also added by Sampson (1987) to an explanatory model of crime; this was thought to affect the ability of parents to supervise their own children as well as their capacity to provide guardianship of the local community.

The concept proposed by Sampson and colleagues as a way of bridging these and other neighbourhood characteristics and crime is *collective efficacy*. Building on notions of trust, cohesion,

[1] Hipp et al. (2009) found that violent crime increased residential instability (particularly in areas with high diversity), but not vice-versa. To that end, violent crime, residential instability and population heterogeneity are linked together in a complex 'spiral of decline' (Hipp et al., 2009; see also Harding, 2008; Kirk and Laub, 2010: 42-48).

[2] Sampson (2008) argues that increased heterogeneity will actually *reduce* disorder.

self-efficacy, collective action and informal social control, collective efficacy has been defined as 'social cohesion among neighbors combined with their willingness to intervene on behalf of the common good' (Sampson et al., 1997: 918). To measure collective efficacy, study participants are asked about the extent to which individuals in a neighbourhood share values, trust one another and are willing to intervene if they see anti-social or criminal acts occurring. These measures have been successfully combined into a single, reliable and valid scale at the neighbourhood level via the development of 'ecometrics' (see Raudenbush and Sampson, 1999; but see Oberwittler, 2001), where higher scores mean a more homogenous neighbourhood in terms of trust, values favouring law-abidance, and acting for the collective good (what might be termed 'pro-social collective efficacy').[3] To summarise the results from Chicago, collective efficacy has been found to have a strong negative relationship with crime, in particular violence (Sampson et al., 1997; Sampson and Raudenbush, 1999; Morenoff et al., 2001), and to mediate the relationship between deprivation, unemployment, ethnic heterogeneity and violent crime (Sampson et al., 1997). In essence, the extent of collective efficacy in a neighbourhood seems to act to dissuade or promote criminal acts by those with greater propensity for crime or who are particularly susceptible to contextual cues.

Of particular relevance to our present study of collective efficacy in London is Sampson's (2006: 162) argument that 'application of neighborhood studies to other societal contexts is badly needed if we are to make further progress in understanding the generalizability of the link between community social mechanisms and crime rates'. Many of the papers which test the crime-collective efficacy relationship within the US use the same Chicago dataset collected by Sampson and colleagues (e.g. Morenoff et al., 2001; Browning et al., 2004; Silver and Miller, 2004; Kirk and Matsuda, 2011; Kirk and Papachristos, 2011; Gibson, 2012). There is a growing body of independent studies that often use the same or similar measures as Sampson et al. (1997) reporting results akin to those in Chicago (Zhang et al., 2007; Sampson and Wikström, 2008; Oberwittler and Wikström, 2009; Odgers et al., 2009; Armstrong et al., 2010; Mazerolle et al., 2010) (for a list of studies which examine collective efficacy and crime, see Appendix A). That said, there have been some contrary results in other contexts (e.g. Kingston et al., 2009; Cerdá et al., forthcoming; Villareal and Silva, 2006) and although a recent meta-analysis by Pratt and Cullen (2005) found that collective efficacy appeared to be an important concept in the understanding of crime (ranked 4th overall), the 'failsafe *n*' for this result was 13.[4]

Our central task in this paper is to assess whether results on collective efficacy generalise to London. Building on other research in this field, we explore the relationship between collective efficacy and violent crime rates in over 4,600 London neighbourhoods. We first examine whether certain structural characteristics predict area-level recoded rates of violence, before then

[3] Reflecting discussions on the strategic and conditional nature of trust, Sampson (2004) makes clear that as with self-efficacy, collective efficacy is task-specific in nature, hence the focused nature of the questions asked.

[4] Meaning that only thirteen 'no effect' studies are required to shift the overall *p*-value reported in the meta-analysis above the 5% significance level.

assessing whether collective efficacy mediates any of the statistical effects, and checking whether these structural characteristics predict collective efficacy.

Research setting

London is the capital of the United Kingdom, and is one of the largest urban zones in the EU. As of the 2011 Census it had an estimated population of 8,173,900 (ONS, 2012a), although the boundaries and population estimates vary, with the 'Greater London urban area' having a population of 8,278,251 in 2001 (ONS, 2001). Between 2001 and 2009, London's population increased by over 430,000 people (ONS, 2011). This is a highly diverse city. Department for Education data shows that over 45% of state funded primary school children have English as a second language. Furthermore there are 41 different national groups – those born outside the UK – with more than 10,000 members (ONS, 2001), with an estimated 300 languages spoken in state schools (von Ahn et al., 2010). In terms of how the ethnic mix of the city has changed over time, figures from the Office for National Statistics (ONS, 2012b) suggest that between 2001-2011 the overall proportion of White inhabitants has dropped by more than seven percentage points, whereas there have been increases in the number of Asian and Chinese residents; but there is substantial ethnic clustering across the city. Administratively, London consists of the Greater London Authority (GLA), the 32 Boroughs and the City of London. Boroughs are themselves divided into 624 electoral wards, which form the basic unit of administrative geography in England. Below this, electoral wards are further subdivided into 4,766 Lower-layer Super Output Areas (LSOAs).

Deprivation and inequality

The 2010 Index of Multiple Deprivation, developed by Noble et al. (2004), shows parts of London are consistently ranked amongst the most deprived in England on some measures (such as income deprivation), as well as being the least deprived on other measures (such as education, training and skills). Generally, the highest concentrations of deprivation are in the east, north, and north-west of the city, mainly in the boroughs of Brent, Hackney, Islington, Newham and Tower Hamlets. Specifically, the three electoral wards with the highest levels of income deprivation in England are in the London boroughs of Tower Hamlets, Newham and Hackney, and nearly one-in-three children in London lives in poverty (GLA intelligence unit, 2011). This masks significant variation within the city. For example there is a forty percentage point difference in the proportion of children in poverty in Hackney (poorest) compared to Richmond (one of the richest). In relation to measures of the lived environment and housing, London is also highly deprived (see Leeser, 2011). London has also amongst the highest income inequality in Europe, with Inner London being the most unequal region in the whole of England having roughly 28% of individuals in both the top and bottom fifths of the income distribution (The Poverty Site, 2011). This division is mirrored in Boroughs themselves, with some of the most

deprived Boroughs containing a mixture of wealthy and very deprived wards (London's Poverty Profile, 2011; GLA, 2002).

Crime trends in London

Table 1 below details the crime rate per 1,000 head of population for a range of offences. As with the rest of England and Wales, crime in London has been declining over the past decade (with the exception being drugs offences, which have increased by 63% in the same period). As with deprivation, these figures mask considerable variation within the city itself. Despite these general reductions in crime, London still stands apart from the rest of England and Wales in the *amounts* of crime experienced, with consistently higher rates of crime identified over the same period (see e.g. Flatley et al., 2010).

Table 1: crime rates per 1,000 head of population in London 2002/03-2010/11

Crime type	**02/03**	**03/04**	**04/05**	**05/06**	**06/07**	**07/08**	**08/09**	**09/10**	**10/11**
Violence	25.00	25.34	27.36	26.58	24.29	23.02	23.12	22.82	21.43
Sexual offences	1.00	1.39	1.47	1.39	1.24	1.16	1.16	1.30	1.32
Robbery	6.00	5.53	5.29	6.11	6.10	4.93	4.31	4.37	4.63
Burglary	16.00	14.34	13.75	13.95	12.88	12.51	12.39	12.12	12.06
Criminal damage	20.00	20.07	18.39	16.49	15.17	13.66	12.62	11.53	10.38
Drugs offences	5.00	6.01	5.92	7.09	7.19	9.50	10.04	8.73	8.18

Sources: GLA & MPS http://data.london.gov.uk/visualisations/atlas/crime-pfa-annual/atlas.html ; http://maps.met.police.uk/

Data

Our data come from a range of sources, combining the Metropolitan Police Public Attitudes Survey (METPAS) collected between 2007-2010; the 2001 Census; reported violent crime data in 2010-2011 provided by the Metropolitan Police; data from the London Ambulance Service on callouts for knife injuries in 2010-2011 provided by the Greater London Authority; and the Index of Multiple Deprivation (IMD) (Noble et al., 2004). METPAS ran between 1983-2012 and was a representative face to face survey of residents of London aged 15 and over, covering a range of topics including public perceptions of the criminal justice system, victimisation, and contact with the police. We use METPAS data from 2007-2010. METPAS used a multistage clustered design, with a total of 267 residents randomly drawn from the Postcode Address File

within each of London's 32 boroughs each quarter.[5] This yielded a total achieved sample of 61,436 and an average response rate of 60% across all boroughs (CELLO mruk research, 2009).

Defining 'neighbourhoods'

Selecting suitable boundaries to represent neighbourhoods has been a longstanding challenge for neighbourhood effects research, with many studies forced to use spatial units that bear little resemblance to residents' own conceptions of their local neighbourhood (Sampson, 2011). In the UK this has meant studies relying on postcode sectors, electoral wards (e.g. Sampson and Groves, 1989), and other administrative boundaries – area geographies that can vary considerably in size and social composition. Larger areas increase internal heterogeneity and make it difficult to identify differences between areas, masking important social processes that operate within smaller geographical areas. Here we use Lower-layer Super Output Areas (LSOA) to represent neighbourhoods. These consist of between 4-6 census enumeration Output Areas (OA), covering roughly 600 households with around 1,500 people on average. Households are grouped together based on spatial proximity, natural boundaries and homogeneity of dwelling type and tenure but unlike electoral wards are not subject to boundary changes. LSOAs are substantially smaller and more internally homogenous than the area geographies that have been relied upon by many previous studies, enhancing our ability to uncover evidence of neighbourhood processes operating within local communities. Data are available from a total of 4,761 LSOAs in London (99.9%), with an average of 12 respondents per area.[6] Henceforth, the terms 'LSOA' and 'neighbourhood' are used interchangeably.[7]

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[5] The city of London is not included in the sample frame because it is covered by a separate police force.

[6] Twelve may seem like a small number of people to reliably report neighbourhood characteristics, but other studies (e.g. Hipp, 2007; Oberwittler and Wikström, 2008) as well as methodological texts in this area (e.g. Snidjers and Bosker, 2012) demonstrate that this number would allow adequate estimates of neighbourhood averages.

[7] We are mindful that METPAS survey respondents were asked questions relating to their 'local area and community', where 'local area' is defined as 'the area within about 15 minutes' walk of here'. Leaving aside the division between 'neighbourhood' and 'community' (see Kirk and Laub, 2010) this means there will be inherent variability in the areas people are thinking about when answering questions about 'neighbourhood'. For a healthy adult, a 15 minute walk could mean up to a mile (1.6km) radius from their house depending on street layout and speed of walking, for someone who was infirmed this would be a much shorter distance. We also know that this will vary by age. Previous research has shown that, for instance, most of the activities of children take place within 800m of their home (Jones et al., 2009) but that adolescents move around a great deal more (Wikström et al., 2010) and thus what they define as their neighbourhood might not match well with administrative boundaries. However, there is other research which demonstrates an overlap between 'artificial' neighbourhoods such as output areas or LSOAs, neighbourhoods as subjectively defined by 'experts' (such as town planners), and residents' own perceptions of their 'neighbourhood' (see Haynes et al., 2007). One important aspect of how residents sort 'their' neighbourhood from others is by housing type (e.g. detached, terraced, etc.) as this is a more visible marker than 'deprivation'. Furthermore, it was noted that typically '[w]hen asked about their neighbourhood, respondents appeared to be describing the conditions within a very small distance from their home' (Haynes et al., 2007: 824), in keeping with more recent theoretical and empirical research on

Violent crime

Two measures of violence are used here. The first uses police recorded counts of violent crimes[8] occurring within the local area and the other is counts of ambulance call outs for injuries relating to knife crime. We incorporate these measures as the rate per 1,000 head of population of 'violence against the person' within each LSOA. The recorded crime measures are capped at 150 offences per 1,000 head of population to mitigate the impact of a small subset of LSOAs with particularly high crime rates. The recorded crime data are highly skewed so unless otherwise stated we use the natural logarithm of the recorded violent crime rate per 1,000 head of population.

Collective efficacy

To measure collective efficacy we adopt a similar approach to Sampson et al. (1997), combining a series of questions covering social cohesion and informal social control. Individuals were asked to report on five-point Likert scales the extent to which they agreed with six statements, from 'strongly agree' (1) to 'strongly disagree' (5) (see Appendix B for details of questions used here and in a sample of other studies). All items were reverse coded so that higher scores represented greater pro-social efficacy (i.e. high trust, high social control), with the six items combined using principle components analysis (PCA) to produce a 'collective efficacy' score for each individual. These were then aggregated to the neighbourhood level.

Neighbourhood crime in 2001

We include a compound measure of all neighbourhood crime in 2001 from the Index of Multiple Deprivation because residents who live in high crime neighbourhoods might be unwilling to intervene and this might confound the collective efficacy/violence relationship.

Neighbourhood social composition

To capture the social composition of each neighbourhood, we used data from the 2001 census of England and Wales and the neighbourhood statistics division of the ONS. This has the advantage of being independent of the METPAS survey data, whilst also allowing for temporal sequencing. Using data for all LSOAs in England and Wales (n=32,478) variables covering unemployment, occupations, population structure, car ownership, housing, occupancy details and tenure, in and out migration, income support and the amount of land classified as domestic, nondomestic, and green space were combined using PCA with an orthogonal rotation to

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the ecology of crime, this suggests that 'smaller is better' (Oberwittler and Wikström, 2008). Given that LSOAs are constructed to capture homogeneity of housing type (amongst other elements) it seems reasonable to assume that they are capturing the lived reality of local residents' neighbourhood.

[8] Murder, wounding (with and without intent), common assault and public (dis)order offences.

produce a series of indicators of neighbourhood difference (see Appendix C).[9] The component structure is similar to previous studies (Morenoff et al., 2001; Sampson and Raudenbush, 1999; Sampson et al., 1997), broadly capturing the levels of neighbourhood socio-economic disadvantage, population mobility, and urbanicity, along with details of the area housing structure and age profile (with the final factor a reflection of both the proportion of children (<18) and the proportion of elderly residents). A measure of population density was also included, along with a measure of the adult-to-child ratio to capture elements of informal monitoring. Finally, we include a measure of the extent of ethnic diversity in the local area, based on the Herfindahl concentration formula (Gibbs and Martin, 1962).[10] This details the probability (ranging between 0/1) of two randomly selected individuals from the same area being of different ethnic origin, with higher scores representing more ethnically heterogeneous neighbourhoods. A table of descriptive statistics for all measures is given in Appendix D.

Analytic strategy

To examine the relationship between collective efficacy, neighbourhood social composition, and violent crime we specify a number of analytical models. First we use multilevel linear regression models to examine the extent that individual perceptions of collective efficacy are shaped by the neighbourhood social composition, over and above the characteristics of the individual sample members. This informs us whether systematic differences in collective efficacy exist between local areas, over and above so-called 'composition effects'. We then examine the aggregate relationships between neighbourhood characteristics, collective efficacy and crime by estimating a series of contextual regression models on the 4,761 neighbourhoods in London. In the first step we present simple correlations between the aggregate measures. Second, we run a series of linear regression models using social composition factors as covariates, with the logged rate of violence per 1,000 head of population as the outcome. Third, we include our neighbourhood collective efficacy measure to give an estimate of the association between efficacy and violent crime, net of compositional factors. Finally, we run Poisson models using ambulance call outs as the dependent variable as validation of the OLS models. Our interest is in exploring whether efficacy is still associated with violence net of compositional characteristics and the extent to

[9] We also explored an oblique rotation. This produced the same factor structure and was substantively the same, so we prefer to use the simpler orthogonal rotation results.

[10] The diversity index is defined as

$$HI = 1 - \sum_{i=1}^{n} s_i^2, \qquad [1]$$

where s_i is the share of ethnic group *i* out of a total of *n* ethnic groups (White, Black, Asian, Mixed, Other).

which efficacy mediates the relationship between measures of disadvantage.[11] All analyses were undertaken with Stata 12.

Results

Correlates of collective efficacy in London

We begin by reporting the results from a series of multilevel models where individual assessments of collective efficacy are the outcome (Table 2). Model 1 partitions the variation in our measure of efficacy between individuals and local neighbourhoods. This reveals that approximately 9% of the variation in levels of efficacy occurs between neighbourhoods lending support to the contention that efficacy is not simply an attribute of individuals, but may also have a collective/shared component. Model 2 incorporates individual predictors of efficacy, with all covariates operating in the expected direction given previous research. Higher levels of individual efficacy are evident amongst older residents and people identified as having a higher socio-economic status. Those working full time and residents of owner occupied accommodation also report higher levels of efficacy, as do longer term residents of the local area (those living in an area for five or more years). Non-white ethnic groups also generally report higher collective efficacy, which is in keeping with research from the US (Hipp, 2010). Adding in the measures of the social composition of local neighbourhoods, a mixed picture is evident (model 3). In keeping with previous findings, residents of more deprived areas and neighbourhoods with a higher density of terraced accommodation report lower efficacy than similar individuals living in more affluent local areas. We also find that average levels of efficacy are lower in more urban neighbourhoods, but higher in areas with an older age structure.

[11] We fit simple OLS and Poisson models for the aggregate analyses and multilevel linear models for individual collective efficacy and calculating aggregate measures. Multilevel models are an extension to standard regression methods that enable us to account properly for the non-independence between residents living within the same local area, and to model heterogeneity in levels of perceived efficacy between neighbourhoods as a function of social composition (for detailed coverage of multilevel modelling see Snijders and Bosker, 2012). Here we use a linear multilevel model, denoted in equation 2:

$$Y_{ij} = \beta_0 + \beta_1 X_{ij} + \alpha_1 W_j + \alpha_2 X_{ij} W_j + u_j \quad . \quad [2]$$

Here Y_{ij} is the perceived collective efficacy in the local area for the *i*th individual in the *j*th neighbourhood. β_0 is the intercept and β_1 is the regression coefficient for individual i in neighoburhood j for the individual-level covariate X. α_1 is the regression coefficient for the area level coefficient W in area j, and α_2 is a cross-level interaction between individual covariate X and area covariate W. In the random part of the model, u_j are neighbourhood departures from the overall level of collective efficacy. To account for the possibility that perceptions of collective efficacy vary systematically within local areas as a function of a person's socio-demographic background, a vector of individual-level controls is included covering gender, age, ethnicity, social class, employment status, and length of residence. As a result, the neighbourhood departures can be thought of as a sample adjusted estimate of the differences in levels of perceived collective efficacy by local residents across neighbourhoods.

Unlike many studies which characterise ethnically diverse neighbourhoods in terms of segregation, distrust and low levels of cohesion (e.g. Putnam, 2007; Goodhart, 2004; Alesina and Ferrera, 2000) we find that levels of efficacy are *higher* in more ethnically diverse neighbourhoods. This might be due to the fact that there is greater ethnic mixing in London, with Londoners more likely to experience meaningful social contact with people from other ethnicities (Hewstone, 2009). We also identify marginally higher levels of 2007-2010 efficacy in neighbourhoods characterized by *greater* levels of migration in the previous year (2000-1).

Contextual analyses of violence in London

Next we use the aggregated measures of collective efficacy in 2007-2010 along with 2001 census neighbourhood data to predict two outcomes: (the natural log of) recorded violent crimes 2010-11, and ambulance callouts for knife crime injuries 2009-11. Both measures are averaged over time and expressed as rates per 1,000 head of population. Table 3 includes estimates from two models with the logged rate of violent crime in the neighbourhood as the outcome. This shows that neighbourhood crime rates are closely related to the structure of the neighbourhood, with the included neighbourhood characteristics explaining nearly 60% of the variation in crime rates. As in previous research, we find that crime rates are higher in more socio-economically disadvantaged neighbourhoods, areas experiencing greater population mobility, areas with a greater proportion of terraced accommodation and flats, and more ethnically diverse neighbourhoods. We also find evidence of enduring patterns of crime over time, with a strong relationship between the levels of crime in 2001 and the violent crime rates in 2010. One puzzling result was for the 'Age structure' factor (which combines the proportion of children and the proportion of elderly residents within a neighbourhood) – the higher this was, the lower the level of recorded violence. Given the time-lag of roughly nine years, it is difficult to imagine why having a more youthful population in 2001 would result in lower recorded violence in 2010/11, unless this is acting as a proxy for the proportion of young families in a given area during that decade.

Coming back to the central focus of the paper and again in keeping with other research in this area, we identify a negative association between collective efficacy and levels of crime (*b* -0.019, se 0.007, $p \leq .01$). However, unlike previous research this is considerably weaker than the other neighbourhood effects, equating to a fall of only 1.9% of violent crimes per 1,000 head of population for every one standard deviation increase in collective efficacy. Interestingly, the inclusion of collective efficacy also only has a marginal mediation effect. The magnitude of effect for socio-economic disadvantage drops slightly when collective efficacy is included, but very few other changes to the model are evident. This is unlike results from, for example, Chicago and Stockholm where the coefficient for disadvantage is cut in half once collective efficacy is added (Sampson and Wikström, 2008: 113). It is worth noting that in addition to finding theoretically relevant relationships, the models do a good job of explaining variation at the neighbourhood level, again similar to results from elsewhere. In summary, whilst collective efficacy is negatively

Table 2: individual and neighbourhood correlates of individual collective efficacy

	Model 1			Model 2			Model 3		
	Coeff.	**SE**	***p***	**Coeff.**	**SE**	***p***	**Coeff.**	**SE**	***p***
Female				-0.001	0.009	0.915	0.000	0.009	0.974
Age				0.018	0.003	0.000	0.017	0.003	0.000
Living_as_married[a]				-0.078	0.016	0.000	-0.078	0.016	0.000
Single				-0.103	0.013	0.000	-0.106	0.013	0.000
Widowed				-0.053	0.018	0.003	-0.053	0.018	0.003
Divorced				-0.219	0.023	0.000	-0.224	0.023	0.000
Separated				-0.190	0.028	0.000	-0.186	0.028	0.000
Mixed[b]				0.063	0.017	0.000	0.057	0.017	0.001
Asian				0.150	0.014	0.000	0.147	0.014	0.000
Black				0.140	0.014	0.000	0.145	0.014	0.000
Other				0.000	0.046	0.995	-0.010	0.046	0.822
5+ year resident				0.101	0.010	0.000	0.100	0.010	0.000
Rented[c]				-0.132	0.010	0.000	-0.142	0.011	0.000
Other_tenure				-0.072	0.034	0.037	-0.084	0.034	0.014
Working FT[d]				0.085	0.010	0.000	0.084	0.010	0.000
Class C1[e]				-0.046	0.014	0.001	-0.043	0.014	0.002
Class C2				-0.089	0.015	0.000	-0.092	0.015	0.000
Class D				-0.109	0.020	0.000	-0.100	0.020	0.000
Class E				-0.043	0.018	0.016	-0.038	0.018	0.033

NH: Concentrated disadvantage							-0.126	0.010	0.000
NH: Population mobility							0.013	0.010	0.185
NH: Urbanicity							-0.041	0.007	0.000
NH: Age structure							0.029	0.007	0.000
NH: Adult:child ratio[f]							0.026	0.008	0.001
NH: Housing structure							-0.100	0.009	0.000
NH: Ethnic diversity (1=diverse)[f]							0.277	0.044	0.000
NH: IMD crime							-0.001	0.007	0.856
Intercept	0.010	0.007	0.124	-0.059	0.027	0.030	-0.257	0.045	0.000
Random effects (sd)									
Between	0.322	0.006		0.304	0.006		0.279	0.006	
Within	0.943	0.003		0.923	0.003		0.923	0.003	
Rho	10.4%	0.004		9.8%	0.004		8.3%	0.003	
N individual / N group	49,560 / 4,748			47,308 / 4,748			47,299 / 4,746		

Note: All neighbourhood independent variables are from the 2001 Census. Individual data and outcome come from METPAS 2007-2010. Additional controls for the quarter the survey took place in were also included to account for seasonality (not shown). [a] Reference group is married. [b] Reference group is white. [c] Reference group is 'owner occupier' (outright or with a mortgage). [d] Reference group is other employment status. [e] Reference group is Classes A & B. [f] Unstandardised measure.

Table 3: OLS regression models for neighbourhood correlates of (log) recorded violence rate per 1,000 (2010-2011 combined)

MPS 2010-11	**Model 1**			**Model 2**		
	Coeff.	**SE**	***p***	**Coeff.**	**SE**	***p***
Factor						
Concentrated disadvantage	0.485	0.012	0.000	0.479	0.012	0.000
Population mobility	0.364	0.011	0.000	0.363	0.011	0.000
Urbanicity	-0.049	0.008	0.000	-0.052	0.008	0.000
Age structure	-0.083	0.008	0.000	-0.082	0.008	0.000
Housing structure	0.295	0.011	0.000	0.291	0.011	0.000
Ethnic diversity[a]	0.458	0.051	0.000	0.478	0.052	0.000
Adult:child ratio[a]	-0.060	0.009	0.000	-0.059	0.009	0.000
IMD crime	0.143	0.008	0.000	0.143	0.008	0.000
Collective efficacy				-0.019	0.007	0.008
Intercept	2.881	0.044	0.000	2.868	0.044	0.000
N	4,759			4,746		
R^2 x 100	58.5			58.5		

Tables notes: [a] Both the diversity index and the adult-to-child ratio are unstandardised measures. Disadvantage, mobility, urbanicity, 'youthfulness', housing structure, ethnic diversity and adult:child ratio all measured during 2001 census. Collective efficacy measured in 2007-2010 with METPAS data.

Table 4: Poisson models for neighbourhood correlates of London Ambulance Service callout rate for knife-crime injuries per 1,000 (2009-2011 combined)

LAS 2009-11	**Model 3**			**Model 4**		
	Coeff.	**RSE**	***p***	**Coeff.**	**RSE**	***p***
Factor						
Concentrated disadvantage	0.638	0.038	0.000	0.636	0.039	0.000
Population mobility	0.401	0.036	0.000	0.400	0.035	0.000
Urbanicity	0.034	0.022	0.112	0.033	0.022	0.127
Age structure	-0.055	0.029	0.062	-0.055	0.029	0.060
Housing structure	0.306	0.030	0.000	0.305	0.030	0.000
Ethnic diversity	1.087	0.166	0.000	1.106	0.167	0.000
Adult:child ratio	-0.020	0.033	0.551	-0.019	0.033	0.572
IMD prior crime	0.272	0.024	0.000	0.271	0.024	0.000
Collective efficacy				-0.018	0.021	0.395
Intercept	-1.318	0.144	0.000	-1.330	0.144	0.000
N	4,759			4,746		
Pseudo-R^2 x 100	17.4			17.4		

Tables notes: [a] Both the diversity index and the adult-to-child ratio are unstandardised measures. Disadvantage, mobility, urbanicity, 'youthfulness', housing structure, ethnic diversity and adult:child ratio all measured during 2001 census. Collective efficacy measured in 2007-2010 with METPAS data.

related to violent crime in London, it is only weakly so. Further, collective efficacy does not appear to mediate the relationship between measures of social disadvantage and crime as it does elsewhere.

We next present results for independently collected data on ambulance callouts for injuries relating to knife crime across London between January 2009 and December 2011 (Table 4). The distribution of the outcome is highly skewed (and this is not ameliorated by logging), so following Gould (2011) we specify a Poisson regression model with robust standard errors. Here we find no direct relationship between collective efficacy and this alternative measure of neighbourhood violence. We were concerned that this might be an artefact of the skewed outcome variable and choice of modelling approach, but alternative specifications (e.g. logit) produce the same pattern of results (not shown). One explanation is that the outcomes used are measuring different things and are thus not comparable, but this is rebutted by the correlation between the two measures (Spearman's rho .505, $p \leq .001$, n = 4,760). Similarly, it is because ambulance callout data is different in some respects that it has appeal. Primarily, such data may capture assaults which go unreported to the police (as noted above). As the seriousness of injuries increases this is unlikely to be the case and it might be that ambulance crews are only called out in situations where violence has already escalated – directly mapping onto recorded violence rates. However, the correlation between ambulance callouts in a given year and rates for specific offence types is only between .4 and .5 for assault and wounding, suggesting that whilst there is some overlap between these measures, the ambulance data is capturing different aspects of violence in London. Finally, it might be that the nature of the act of calling an ambulance overlaps strongly with elements of collective efficacy (helping one's neighbours, acting if trouble arises). However, if this were the case then we would expect ambulance call outs to be highly correlated with collective efficacy, rather than conditionally orthogonal to it.

Discussion

This paper combines a unique, underutilised survey (although see Jackson et al., 2012) with administrative data to examine collective efficacy in London. The dataset arising from this work provides a diverse test-bed. Using small-area geographies for over 4,600 neighbourhoods, we found that the correlates of collective efficacy in London appear to be similar, in many cases the same, as those reported elsewhere in the (mainly Western) world (e.g. Mazerolle et al., 2010). Concentrated disadvantage, the extent of 'urbanicity', the relationship for vacant properties/terraced housing were, for example, negatively related to collective efficacy.

Conversely, we found that ethnic heterogeneity in 2001 was positively associated with greater collective efficacy in 2007-2010 (cf. Sturgis et al. 2013). At first this seemed counter-intuitive given results from elsewhere, but we believe that our measure of ethnic diversity is capturing the effects of two related processes. First, although London's population increased by an estimated 430,000 between 2001 and 2009 (ONS, 2011) it is the *rate of change* that matters. Slow and steady in/out migration would not result in wholesale destruction of personal networks and/or social

control (Kirk and Laub, 2010). However, rapid changes to demographics likely would. Second, as a function of in-migration to so-called 'ethnic enclaves' (Johnston et al., 2002), immigrants moving to London exist in pockets of social life rather unlike those around them – they may already have family and friends living nearby and are able to seamlessly move from one geographical context to the next with a great deal of continuity, fostering or maintaining higher levels of collective efficacy (for a detailed discussion of this issue see Kirk and Laub, 2010). As such, we believe this measure of diversity captures some stability of residence and pre-existing network ties, hence the positive association with collective efficacy. Much has been made about influxes of poor residents to an area, but as Van Wilsem et al. (2006) discuss, an influx of socio-economically *advantaged* groups could lead to disorganisation because of the lack of commonality between the old and new residents. We also found that the 'age structure' of the neighbourhood was positively related to levels of collective efficacy as was the ratio of adults to children. We believe these results might, in part or whole, reflect the proportion of families with young children living in a given area, but more research is needed in this area to unpick this relationship.

However, contrary to other research in both the United States and Europe, we did not find that collective efficacy mediated the relationship between disadvantage, residential instability and recorded violent crime. Furthermore, collective efficacy was only weakly related to violent crime rates, and *unrelated* to an alternative measure of community violence (ambulance call outs for knife crime injuries). Some research has already pointed to the 'limits of collective efficacy' (Cerdá et al., forthcoming; Villareal and Silva, 2006; Maxwell et al., 2011) and these results contribute to that debate.

One area for criticism is our neglect of social and political institutions, specifically their role in ameliorating/propagating deprivation and/or crime. What exactly is meant by 'institution' appears to be open to interpretation with the current *criminel du jour*, banks (Veléz and Richardson, 2012), being included alongside youth / community organisations (Gardner and Brookes-Gunn, 2009), and the police (Sampson and Bartusch, 1998; Kubrin and Weitzer, 2003a). It is important to remember that neighbourhoods do not exist in a political vacuum. But we do not think there is a convincing argument for claims such as 'mortgage lending will *directly* affect local homicide much like other structural variables such as neighbourhood disadvantage' (Veléz and Richardson, 2012: 495 emphasis added) as it is more likely that the impact of the local political economy would be felt *in*directly through, in this case, rates of homeownership and concomitant residential stability (see Kirk and Laub, 2010: 44; Kirk and Hyra, 2012).

We take more seriously the potential criticism in relation to the omission of community groups and the police, specifically the *quality* of police-public interactions. These again are elements that may have direct and/or indirect influences on the likelihood of violence occurring through a variety of mechanisms (see e.g. Kubrin and Weitzer, 2003b). We intend to investigate these further, particularly the role played by legal cynicism where agents of law enforcement are regarded as '*illegitimate*, *unresponsive*, and *ill equipped* to ensure public safety' (Kirk and Matsuda, 2011: 444 emphasis in original), as this would act to limit the legal options available to resolve

disputes. With formal criminal justice avenues closed, settling disputes using violence would become more salient, thus increasing violence (and perhaps other crimes), as well as reducing the likelihood of cooperation with the police. Several papers have examined this (Kirk and Papachristos, 2011; Sampson et al., 2005; Sampson and Bartusch, 1998) – although each takes a slightly different view on how cynicism should be conceptualised and operationalised. Nevertheless, Kirk and Matsuda (2011) demonstrate that high levels of legal cynicism at a neighbourhood level result in a lower likelihood of arrest for an individual after they have committed a crime, especially if that neighbourhood is predominantly black. They extend this by arguing that collective efficacy is the mediating mechanism between legal cynicism and the probability of arrest. In areas devoid of collective efficacy, the probability of arrest following a crime is almost zero, but increases as collective efficacy increases, net of neighbourhood legal cynicism. They also suggest that legal cynicism inhibits collective efficacy in environments with dense social ties. A neighbourhood with high collective efficacy and high levels of legal cynicism might result in more crimes occurring because of a belief that 'the police can/will not act so we must protect ourselves'.[12]

Critics might also point out that a study in Chicago (1990-1995) is very different from London (2001-2011) and thus they are not comparable. Patterns of residential segregation are nowhere near as stark in London even now – one need only look at racial maps of the two cities to see this. Another reason for the different results might be the greater temporal lag in the present study. We have 2001 census data for LSOA characteristics, then outcome data from 2007-10 and 2010-11. Changes may have occurred in some LSOA demographics between these time-points, but equally there will be a lot of stability in others. Given this, inter-temporal changes might part account for the relationships noted. But Sampson (2009a) demonstrates that neighbourhood characteristics are quite stable over time, something he has shown empirically within the US (Sampson, 2009b).

Conclusion

Going beyond neighbourhoods

The results from our models for collective efficacy appear to support the view that 'smaller is better' (Oberwittler and Wikström, 2008). We found 9% of variation in levels of collective efficacy occurred between neighbourhoods (as so defined) meaning that 91% of variation occurs *within* them. This might help to explain the weak relationship between collective efficacy and violence: in essence we may be operating at too high a level of aggregation. However the work of Wikström et al. (2010, 2012) highlights that no matter how small, focusing on geographical units has its limitations. To understand the relationship between environment and behaviour we need to gain a better understanding of *which people go where*, *when* and *with whom* (kinds of people in

[12] We may have seen examples of this during the 2011 London riots when ethnic minority businessmen and their relatives took to the streets with weapons in order to protect their businesses and neighbourhoods from rioters.

kinds of places). The central reason for doing so is that '[p]eople react to the same set of local circumstances in different ways' (Haynes et al., 2007: 823), a view which is supported both theoretically and empirically (see Wikström et al., 2012). This type of work documenting time spent on activities has been undertaken in time-use studies (e.g. Gershuny and Sullivan, 1998). However, Wikström et al. (2010, 2012) have developed a space-time-budget (STB) methodology which captures both the *where*, *when* and *with whom*. Without such knowledge, we may mistakenly believe that greater ethnic diversity equates to better social mixing, but it may be that groups lead 'parallel lives' (Burgess et al., 2005), where different ethnic groups exist in contiguous but non-overlapping daily routines, with little or no influence on one another, operating with high levels of in-group/out-group bias. Similarly, although research (e.g. Haynes et al., 2007) demonstrates a good overlap between subjective and artificial definitions of 'neighbourhood', these may still not capture where people go and what therefore influences their conceptions of place.

Collective efficacy and violence – is the cart before the horse?

We have ignored the issue of the precise causal (and likely cyclical) relationship between collective efficacy, concentrated deprivation, 'disorder', and violence. Sampson (2006: 157-9) alludes to this with some analyses from Chicago demonstrating that collective efficacy in 1995 was predictive of the level of deprivation five years later (r = .86; R^2 = .75). It seems likely that present day collective efficacy is a function of both past levels of violence and one or more of the factors comprising concentrated disadvantage. Skogan (1986: 207), for example has argued that 'the engine of neighborhood change is selective out-migration'. If, as Sampson (2006) suggests, current collective efficacy is a determinant of future economic success, then there is a serious endogeneity problem[13] with research on collective efficacy which will only be resolved through strong theorising and better data which incorporate changes within and between neighbourhoods over time (Kirk and Laub, 2010) and using methods which focus on change (such as fixed-effects longitudinal models). The promise of such analyses is being able to disentangle some of the complexities within this field, as Hipp et al. (2009) appear to have done for residential instability and violence.

A final point which highlights the complexity with broadly defined 'neighbourhood effects', is the distinction drawn by Wikström and Sampson (2003) between neighbourhoods as 'contexts of action' and 'contexts of development'. In terms of the latter there is good evidence that the collective efficacy of neighbourhoods influence the development of criminal propensity in adolescents, but neighbourhood collective efficacy is *much less* important than the collective efficacy of the family (see Wikström, 2012). Returning to the former – neighbourhoods as 'contexts of action' – it is unlikely that there are simple deterministic relationships between neighbourhood characteristics and criminal acts. As we note above, here we are only dealing with one element of actions defined as crimes so in order to explain crime: '...we must understand the

[13] 'Endogeneity refers to the fact that an independent variable included in the model is potentially a choice variable, correlated with unobservables relegated to the error term' (Millimet, 2001).

complexity of crime as a type of behavior. Crime is, for analytic purposes, similar to a backache. Backaches will never be attributable to any single cause; neither will criminal acts' (Brantingham and Brantingham, 1993: 6).

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APPENDIX A: SAMPLE OF LOCATIONS WHERE COLLECTIVE EFFICACY AND CRIME HAS BEEN ASSESSED

	Study	Location
1.	Armstrong et al. (2010)	Mesa, Arizona
2.	Breetzke (2010)	Tshwane, South Africa
3.	Browning et al. (2004)	Chicago, USA
4.	Cerdá et al. (forthcoming)	Chicago, USA & Medellín, Colombia
5.	Kirk and Papachristos (2011)	Chicago, USA
6.	Gibson (2012)	Chicago, USA
7.	Lowenkamp et al. (2003)	UK-wide
8.	Maxwell et al. (2011)	Chicago, USA
9.	Mazerolle et al. (2010)	Brisbane, Australia
10.	Morenoff et al. (2001)	Chicago, USA
11.	Obertwittler (2001)	Freiburg, Germany & 'rural location'
12.	Odgers et al. (2009)	UK-wide
13.	Sampson et al. (1997)	Chicago, USA
14.	Sampson and Groves (1989)	UK-wide
15.	Sampson and Wikström (2008)	Chicago, USA & Stockholm, Sweden
16.	Silver and Miller (2004)	Chicago, USA
17.	Veléz (2001)	Indianapolis, Rochester, Tampa-St. Petersburg, and St. Louis
18.	Villareal and Silva (2006)	Belo Horizonte, Brazil
19.	Zhang et al. (2007)	Tianjin, China

Other studies have also found an association between collective efficacy (or its subdomains) and youth problem behaviour (Rankin and Quane 2000), delinquency (Simons et al., 2005), and intimate partner violence (Browning, 2004).

APPENDIX B: QUESTIONS USED FOR COLLECTIVE EFFICACY SCALE IN METPAS & EXAMPLES OF QUESTIONS USED IN OTHER STUDIES

METPAS

Participants were asked to respond whether they 'strongly agree' (1), 'agree', 'neither agree nor disagree', 'disagree' or 'strongly disagree' (5).

Cohesion/trust

- People in this neighbourhood can be trusted.
- People act with courtesy to each other in public spaces in this area.
- You can see from the public space here in the area that people take pride in their environment.

Informal social control/willingness to intervene

- If any of the children or young people around here are causing trouble, local people will tell them off.
- The people who live here can be relied upon to call the police if someone is acting suspiciously.
- If I sensed trouble whilst in this area, I could get help from people who live here.

PHDCN (Sampson et al., 1997)

Informal social control

Neighbours can be counted on to intervene if:

- Children were skipping school and hanging out on a street corner.
- Children were spray-painting graffiti on a local building.
- Children were showing disrespect to an adult.
- A fight broke out in front of their house.
- The fire station closest to their home was threatened with budget cuts.

Social cohesion/trust

- People around here are willing to help their neighbours.
- This is a close-knit neighbourhood.
- People in this area can be trusted.
- People in this area generally don't get along with each other.
- People in this neighbourhood do not share the same values.

Sampson and Wikström (2008)

- Informal social control: "If some children were spray-painting graffiti on a local building, how likely is it that your neighbours would do something about it?".
- Informal social control: "If there was a fight in front of your house and someone was being beaten or threatened, how likely is it that your neighbours would break it up?".
- Trust/cohesion: "People around here are willing to help their neighbours".
- Trust/cohesion: "People in this neighbourhood can be trusted".

Mazzerolle et al. (2010) 'derived from PHDCN'

Informal social control/Willingness to intervene

- If a group of neighborhood children were skipping school and hanging out on a street corner, how likely is it that your neighbours would do something about it?
- If some children were spray-painting graffiti on a local building, how likely is it that your neighbors would do something about it?
- If there was a fight in front of your house and someone was being beaten or threatened, how likely is it that your neighbors would do something about it?
- If a child was showing disrespect to an adult, how likely is it that people in your neighborhood would scold that child?

- Suppose that because of budget cuts the fire station closest to your home was going to be closed down by the city. Would you say that neighborhood residents would organize strongly to try to do something to keep the fire station open?

Social cohesion/trust

- People around here are willing to help their neighbors
- This is a close-knit neighborhood
- People in this neighbourhood can be trusted.
- People in this neighbourhood generally don't get along with each other.
- People in this neighbourhood do not share the same values.

Cerdá et al. (forthcoming)

Informal social control

- Someone would call the police if they saw a fight in the street.
- A neighbour would advise the parents of a child that their child was making trouble.
- A neighbour would reprimand someone because that [person] left graffiti in a house or building in the neighbourhood.
- Someone would intervene if a child was being disrespectful to an adult.

Social cohesion

- Neighbours help survey the neighbourhood.
- One neighbour helps the other.
- People offer to work in a committee or council for the neighbourhood.
- Neighbours help survey or care for the children of others.

APPENDIX C: ROTATED FACTOR LOADINGS FOR NEIGHBOURHOOD MEASURES BASED UPON 2001 CENSUS DATA FOR ALL OF ENGLAND AND WALES (N = 32,478)

	Rotated Component Matrix[a]				
	Concentrated disadvantage	Population mobility	Urbanicity	Age structure	Housing structure
% income support	**.890**	.202	.155	.125	.085
% lone parent	**.836**	.024	.149	.293	.142
% local authority housing	**.852**	-.008	.019	.078	-.153
% unemployed	**.828**	.200	.212	.119	.130
% no car	**.817**	.371	.338	-.089	.069
% professional or managerial	**-.780**	.155	-.024	.174	-.343
% owner occupied	**-.620**	-.374	-.163	-.529	.040
% domestic land use	.044	.110	**.919**	.044	.174
% green space	-.143	-.130	**-.905**	.030	-.048
Population density	.237	.242	**.807**	.162	-.094
% agricultural land	-.109	-.052	**-.628**	-.095	.037
% in migration	-.098	**.868**	.048	.082	.123
% out migration	-.045	**.856**	.098	.126	.203
% single parent non-pensioners	.314	**.778**	.244	.074	-.057
% non-domestic land use	.292	**.570**	.262	-.083	-.066
Occupancy rating	.454	**.552**	.376	.144	-.287
% under 18	.405	-.398	.039	**.702**	.136
% over 65	.015	-.251	-.148	**-.902**	-.043
% vacant property	.227	.459	-.138	-.145	**.541**
% terraced property	.274	.095	.259	.242	**.690**
% flats	.485	.529	.214	-.105	**-.502**
Factor name	ldisad	lpoptrans	lurban	lyouthpop	lhouse

Table notes: [a] Rotation converged in 6 iterations. Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

APPENDIX D: DESCRIPTIVE STATISTICS

Individual measures (max *n* = 61,437)

		Mean	SD
Demographics			
	Female	0.53	0.50
	Resident 5+yrs	0.61	0.49
	Working full-time	0.46	0.50
Age		**n**	**%**
	15-17	827	1.35
	18-21	2,215	3.61
	22-24	2,942	4.79
	25-34	11,912	19.39
	35-44	13,603	22.14
	45-54	10,304	16.77
	55-64	7,486	12.18
	65-74	7,904	12.87
	75-84	3,254	5.3
	85+	682	1.11
	Missing	308	0.5
Ethnicity			
	White	40,753	66.33
	Mixed	4,146	6.75
	Asian	8,079	13.15
	Black	7,503	12.21
	Chinese/other	737	1.20
	Missing	219	0.36
Marital status			
	Married	29,971	48.78
	Living as married	5,597	9.11
	Single	16,182	26.34
	Widowed	5,101	8.3
	Divorced	2,419	3.94
	Separated	1,523	2.48
	Missing	644	1.05
Socio-economic group			
	A- Higher managerial/professional	707	1.15
	B - Intermediate managerial/professional	7,923	12.9
	C1- Supervisory/ clerical	19,860	32.32
	C2 - Skilled manual workers	15,401	25.07
	D- Semi-skilled and unskilled manual workers	5,544	9.02
	E - Casual labourers, pensioners, unemployed those on basic benefits	10,661	17.35
	Missing	1,346	2.19

Neighbourhood measures (max *n* = 4,761)

	N	Mean	SD	Min	Max
Violence rate[a]	4760	21.72	19.89	0	150
Ambulance call rate (knife crime)[a]	4760	0.55	0.94	0	15.42
Concentrated disadvantage[b]	4759	0.24	1.17	-2.31	4.09
Population mobility[b]	4759	0.56	1.19	-1.53	7.36
Urbanicity[b]	4759	0.90	0.82	-2.08	6.11
Age structure[b]	4759	0.32	0.75	-3.56	3.55
Housing structure[b]	4759	-0.88	1.25	-5.74	5.50
Ethnic diversity (1=diverse) [b]	4760	0.40	0.18	0.01	0.72
Adult:child ratio[b]	4760	3.67	1.22	1.60	11.80
IMD crime[b]	4760	0.40	0.71	-2.02	3.13
Collective efficacy[b]	4748	0.02	0.45	-2.24	1.59

[a] Both rates are calculated as per 1,000 head of population, with violence capped at 150. [b] Unstandardised measures are given here.