Comparing the effects of socio-economic and spatial factors on crime patterns at the macro level of a London borough

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Abstract
Recent study using space syntax to analyse spatial patterns of crime has shown that at a micro level of the individual dwelling and its neighbouring spaces, the spatial configuration of an urban layout is a factor in crime vulnerability, in that, given that the local conditions are right, spatial integration and visibility can reduce vulnerability and segregation with increase it (Hillier and Shu, 2000). The study has also suggested that there may be similar configurational effects at the level of the residential area, although at this level possible interactions between spatial and socio-economic factors have also been identified (Hillier, 2000). Another syntax-based study, however, has shown that if a whole town or large urban area is studied as a whole, then higher crime levels are often associated with the more integrated and more central areas, thus suggesting that integration may be a disbenefit. However, these apparent higher rates may be simply an artefact of the fact that integrated and central areas have higher densities of population and premises, and greater mixes of use, and therefore higher crime opportunities. They also tend to have less advantaged populations who are known to be more vulnerable to crime in general. The 2001/2002 British Crime Survey has in its findings also linked socio-economic factors to different types of crime and crime victimisation but because bivariate analysis is used, it has not been possible to differentiate the factors that affect crime patterns (Simmons, 2002). It is unclear then whether spatial or socio-economic factors are responsible for higher crime rates in more integrated and central areas.

Keywords
Crime, spatial factors, socio-economic factors

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Of particular interest to this study is the application of space syntax as a tool and methodology in analysing space, which has proven successful in previous crime and space studies. Other studies have used geographical information system (GIS) to map or analyse crime based on recorded crime statistics, and socio-economic and demographic variables. But, unfortunately these do not adequately show the exact location of crime at the neighbourhood level (Cozen et.al 2002) and do not analyse space. This study aims to clarify this by carrying out a study of social and spatial factors in parallel, in relation to average crime rates in the wards of a London borough (Waltham Forest) using space syntax. This is done by comparing and mapping deprivation, integration and crime patterns of the wards using census data from the 1991 Census for the socio-economic and demographic data, 'axial' (line based) space syntax analysis for the spatial data, and police record for the crime rates. Key findings are that although prima facie there appears to be a slight tendency for overall crime rates to be higher in more integrated areas, when these are considered alongside

socio-economic and demographic factors in a multivariate analysis, the effects disappear, and with certain spatial variables even seem to be reversed. The study also observed a number of interesting relations among the socio-economic factors; an apparently strong association between the numbers of children in a ward and the average crime rate disappears when the relative deprivation of the ward is taken into account, as does an apparent correlation with unemployment when children are taken into account. It is concluded that these differences are shown to be differences between spatially grouped rather than dispersed wards, so the effects are really broader regional effects which are above the level of the ward.