

## 2 The spatial form of poverty in Charles Booth's London

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### Abstract

This paper reviews recent research into poverty and spatial form and describes how the application of space syntax methods to this research area, coupled with the use of primary data from the Charles Booth maps of Poverty in 19th century London, has enabled analysis of the socio-economic and spatial structure of areas frequently perceived as 'ghettos'. Through a comparison of two distinctive areas of London – Soho in the West End and the famously poor area of London's East End, the analysis shows a consistent correspondence between poverty and spatial segregation. Booth's economically based 'line of poverty', used to distinguish between those 'in poverty' and those living 'in comfort' is supplemented in this paper by a proposed spatially defined line of poverty, distinguishing between poor, spatially segregated streets and more prosperous, spatially integrated streets. Furthermore, through the application of the latest segment angular techniques, space syntax analysis reveals a new finding relating to the formation of poverty areas, which combine low integration with large numbers of small street blocks, suggesting that this combination of spatial factors helps explain the persistence of poverty and poor quality housing, detrimental to the living standards of the poverty classes. This finding also helps explain how such areas can create a sense of entering 'another world', with the emergence of sub-cultures and new communities. The paper concludes with the proposition that when such areas are located close to economically active, well integrated streets, such spatial patterning can serve as a necessary mechanism for the social integration of minorities and is frequently part of a natural process of acculturation and integration in the urban environment.

### Introduction

"Segregation is one of the key methods of accommodating difference" (Peach, 1996: abstract)

The importance of urban form in affecting social outcomes, such as poverty, is at the root of the study described here. Despite a recent growing interest in understanding the processes involved in the formation of poverty areas within cities (DTLR, 2001), this paper is different from other studies in its focus on the relationship between urban morphology and the spatialisation of poverty. It is also methodologically novel in its use of space syntax methods to arrive at quantifiable measures of local patterns of space in order to explain why poverty areas emerge. Other aspects of spatial analysis considered here include the persistence of poverty areas over time and the relationship between poverty areas and economic activity.

This paper describes spatial analysis of poverty in late 19<sup>th</sup> century London. The main source on poverty at the time is the multi-volume 'Life and Labour of the People in London' (Booth, 1891) and the maps of poverty published by Booth in 1889 and 1899. It has been said that Booth's work was the first 'empirical sociology' (Pfautz 1967: 127) of poverty and wealth and the accuracy and coverage of Booth's data made their analysis ideal for the research described here<sup>1</sup>.

The period studied in this paper was a critical point in the social and economic history of London. Worsening poverty and unemployment during the period culminated in the publication of a searing account of the life of the poor in 'The Bitter Cry of Outcast London' by William Preston in 1883. Growing public concern with the situation of the poor as well as the potential threat to social order was raised by graphic (and in many cases exaggerated) accounts in the popular press of the time (Ginn, 2006). During the 19th century, London had a labour market based on small scale production and the finishing trades. The employment was seasonal and workers were employed on a casual basis, with employment rates fluctuating with the demands of the market. Rather than being experts in a single trade, some workers would hold several occupations during the year. Davin (1996) shows how this pattern of work made workers much more spatially dependent; work was reliant on local knowledge built up through longstanding residence in the area:

The local network played a central part in day-to-day survival when times were difficult, you knew or would quickly hear on the grapevine where to go for cheap or free food and fuel, who would give you credit, where there might be homework given out or a child wanted for errands or child care, what firm was taking on hands, how to get a reference or charitable help... (Davin, 1996: 34)

On the other hand, the poorest classes were the most transient and thereby the poorest were the most disadvantaged by having to move:

Variations in family income or household composition were often a reason for changing house. When income shrank through illness or unemployment, leaving even less margin for rent, somewhere cheaper had to be found. (Davin, 1996: 35)

Davin shows that this 'restlessness' was criticised by the comfortable classes and Evans (1978) shows how a misunderstanding of the nature of poverty led to the middle classes avoiding contact with the poor, except through the accounts of reformers and professionals such as clergy and public health inspectors. The poor were also viewed as being perversely immobile, concentrating in large masses of disease and immorality. The poor problem had become a spatial problem, since high concentrations of poverty were seen to be risking both moral and physical contamination by the casual poor of the respectable poor.

By the end of the 19th century the problem of the teeming masses of the poor had become so bad that it was a topic of constant concern. The Artisans and Labourers Dwelling Act (the Cross Act) of 1875 was passed in order to enable local authority clearance and rebuilding of the worst housing, although as pointed out by Fishman (1988: 8), this process took many years and ultimately led to private investment initiatives, (such as the East London Dwellings Company) to construct modern dwellings for profit. It can be said that the roots of the transformation of modern cities, are the housing changes made from the end of the 19th century onwards. This is described by Hanson (2000: 100):

One of the earliest inward-facing morphologies in the record, and one of the most influential and best-publicised philanthropic housing schemes for the working classes, was Henry Roberts Model Housing for Families at Streatham Street, Bloomsbury (1847-50)... Nor did all the early model housing turn its back so obviously to the street: some small schemes were built as walk-up flats with an entrance from the street, others favoured outward-facing balcony access, but the majority opted for the more controllable courtyard form... by the 1860s... the Peabody Trust, was master-planning large rectangular urban sites as arrangements of 'simple, clean-shaped blocks, without re-entrant angles, facing the street on the one side and a large private court on the other' (Tarn, 1969, p. 21) as the most healthy, affordable and safe way to house the urban labouring classes. The agenda for the first urban transformation had been set.

Hanson shows that the unforeseen outcome of the planning solutions to poverty was that – despite some improvements to sanitary provision, quality of construction and internal layout – the nature of the new housing form was to create deeper, more labyrinthine layouts which cut off the inhabitants from the everyday life of the streets:

Indeed, the whole story is one of a ruptured interface between dwelling and street.... strangers passing through have been eliminated from the interior of the estate altogether by means of its intimidating, bounded and labyrinthine layout. (Hanson, 2000: 113).

The detrimental effect on social integration was to have its worst effect on the weakest and least powerful; "those who depended on their local environment the most to support them in their everyday life" (Hanson, 2000: 117-118). Hanson's proposition is that the unexpected outcome of the built solution to poverty was to exacerbate the separation between classes.

Analysis of the spatial form of immigrant quarters (Vaughan, 2005; Vaughan and Penn 2006) has concluded that immigrants tend to congregate in poverty areas, suggesting that it is the location and spatial segregation of the area itself which make it more likely to be settled by poorer immigrants. This paper takes this research further, using the latest space syntax methods of segment analysis to compare two districts of London and by considering the relationship between immigrants and living in a poverty area.

The first part of this paper gives a background to research into poverty areas, explains the nature of space syntax research into poverty and introduces the Charles Booth maps of poverty. This is followed by analysis of two poverty areas on the Booth maps, the East End and Soho and analysis which leads to the spatial definition of a 'poverty line'. After this comes analysis of the impact of the slum clearances which took place in the period between the two Booth maps (1889 and 1899) and the spatial form of immigrant settlement during this period. The paper ends with conclusions about the nature of spatial segregation and its impact on poverty.

## **The study of Poverty Areas**

Research into poverty areas suggests that despite the many attempts to improve housing quality over the past 100 years, these interventions have “failed to substantially alter the geography of poverty”, Orford et al. (2002: 34). Similarly, a recent White Paper on planning cities, DTLR (2000), indicates that “many of the areas of East London identified by Charles Booth in the late 19th century still show up today as having the worst social deprivation; in three wards in Tower Hamlets over 80% of children live in households that depend on means tested benefits” (DTLR, 2000: section 2.18).

The importance of space itself in having an impact on people’s lives is rarely highlighted in contemporary studies of life in poverty, despite the fact that accessibility to the economic life of the city is clearly of as paramount importance today, as it was 100 years ago. One exception to this is Lupton (2003a: 5), who states that:

physical characteristics, through their impact on population mix, lead neighbourhoods to ‘acquire’ certain other characteristics, such as services and facilities, reputation, social order and patterns of social interaction, as people and place interact. For example, disadvantaged individuals in an isolated area will form one set of social relations, while disadvantaged individuals in a well-connected area may form another.

Another growing focus of interest is neighbourhood design and well-being in poverty areas. Ellaway et al. (2005) show that area of residence is increasingly recognised as being associated with levels of obesity and physical activity. Barton (2005), in an unpublished paper - ‘Healthy Urban Planning and Transport’, states that “the segregation of land uses is undermining the potential for integrated neighbourhoods and local social capital.” Whilst Bonnefoy et al. (2003) have highlighted a new distribution of housing conditions, with pockets of poverty alongside wealth. As noted by Glennerster et al. (1999: 8): “in the past decade or more we have begun to find increasing evidence first that inequality has grown sharply and secondly that it is more geographically concentrated.” This ties in with findings in an early report on this author’s Booth study (Vaughan et al, 2005a), which has shown that fine-scale spatial variations can give rise to conditions of spatial and social segregation.

This paper maintains that it is vital to consider the physical dimension of poverty, since living in a poverty area can exacerbate the disadvantages of poor individuals. Moreover, the establishment of an area as ‘poor’ is the result of a series of processes which have an impact on the area’s deprivation. These can be concentrations of inadequate housing, bad health and other cycles of areal (area based) economic deprivation (Lawrence, 2005). Studies in the 1980s and 1990s by the Space Syntax Laboratory have found that living in poverty areas makes you more vulnerable to crime (Hillier, 2004). Lastly, poverty can also lead to unequal access to jobs and thus high rates of unemployment in a particular area (Spicker, 2003; Green and Owen, 2006).

Typical geographical research into social data involves the use of mapped data to identify visually apparent patterns. The drawback is that these tend to highlight problematic clusters (e.g. robberies in town centres) and ignore problematic distributions (e.g. burglaries in cul-de-sacs). Unlike other studies of this type, space syntax studies do not seek to aggregate data, instead they analyse statistical relationships between properties of spatial layouts and the occurrence of particular social phenomena (cf. Hillier, 2004 on crime).

Space syntax methods are particularly useful in addressing the questions raised in this paper, since they enable an understanding of the impact of small-scale variations in the urban fabric. The accuracy of spatial data is also vital to this type of study, as is the ability to relate spatial and social data at the street block scale. Previous research by the author (cf. Vaughan and Penn 2001) has developed such techniques for modelling the growth of immigrant quarters over time, using census records of entire population cohorts matched to spatial location and mapped over time. This methodological approach allows for small differences between neighbouring streets and their degree of inter-accessibility to be quantified precisely, whilst the importance of this scale is that it is at the level at which people experience the city – the scale in which they meet, interact and carry out economic transactions. With the ability to represent and quantify the relational properties of the space structure of street networks and open spaces, coupled with spatially precise social data, spatial measures are independent of variables such as class, land values and land-use, so the relationship between urban form and social structure can be studied statistically, with each variable considered in turn.

Booth's 'Life and Labour of the People in London' is, as the title suggests, a study of the local economy of each part of London. The colouration of the maps published with the books is based on a clear-cut differentiation of poverty counts from street to street (and in many cases, variations between street sections), accompanied by his own assessments about each district of the city, which were based on classifications collected by Booth and his team of researchers. These included School Board Visitors, who had a detailed knowledge of families with children. There has been criticism of the maps being impressionistic. For example, Topalov (1993) maintains that there is a certain interpretive quality to the Booth maps, firstly in the actual definition of class division, secondly in the possible subjective assigning of families to class categories. In addition to which, some of the data were extrapolated from the individual (school records) to the family level. However, the Visitors information was "cross-checked against those of philanthropists, social workers, policemen and others" (Englander and O'Day, 1998: 124). Bearing in mind that Booth gathered copious evidence on income and patterns of employment and unemployment, it can be argued that Booth's classifications were as precise and as scientific as could be achieved at the time. Both the 1889 and 1899 maps show a delineation of poverty situation based on employment patterns and forms of labour, with the result that what might have been regarded as classification according to degrees of poverty came also to be thought of as classification according to different kinds of work (Hennock, 1976). For the revised 1899 map, members of the Booth Inquiry went on 'Walks' around the area, - usually an investigator and a policeman - recording their impressions of change of colour since 1889. These are vivid in language and opinion and frequently show a great detail of change from the survey a decade earlier<sup>2</sup>. Underlying the classification is an emphasis that some of the poor are there for no fault of their own and perhaps a reorganisation of space will eliminate the worse street culture (Booth, 1891). As stated by Fishman (1988: 11), "the poor were not a homogeneous class", but varied in their situation according to their work status.

In both the 1889 and 1899 maps, the classification used a colour code that can be seen in table 2.1 - the classes shown in parentheses refer to the more detailed classifications used in the published books:

“Black. The lowest grade (corresponding to Class A), inhabited principally by occasional labourers, loafers and semi-criminals - the elements of disorder.

Dark Blue. Very poor (corresponding to Class B), inhabited principally by casual labourers and other living from hand to mouth.

Light Blue. Standard poverty (corresponding to Classes C and D) inhabited principally by those whose earnings are small... whether they are so because of irregularity of work (C) or because of a low rate of pay (D).

Purple. Mixed with poverty (usually C and D with E and F, but including Class B in many cases).

Pink. Working class comfort. Corresponding to Class E and F, but containing also a large proportion of the lower middle class of small tradesman and Class G.) These people keep no servants.

Red. Well-to-do; inhabited by middle-class families who keep one or two servants.

Yellow. Wealthy; hardly found in East London and little found in South London; inhabited by families who keep three or more servants, and whose houses are rated at £100 or more.”

**Table 1: Booth classification of poverty classes. Source: Bonnefoy et al., 2003: 53**

For the purposes of this study, one of the most important aspects of the Booth maps was the presentation of spatially accurate data at the level of the street block and the large area of coverage of the data. Having two maps set 10 years apart, showing data collected by the same methods, meant that the author's research team had at their disposal an invaluable source of data showing spatial and social change over time. The use of temporal analysis provides an understanding of past processes; historical and contemporary analysis of poverty and space and can provide insight into the future impact of planning decisions.

### **The spatial form of poverty**

Figure 2.1 is an extract from Booth's 1889 map of poverty. It shows that the main streets of the East End, Whitechapel Road and Commercial Road East are classified as red (middle class - dark grey on the main streets in this greyscale image), whilst the remainder of the district is classified in the classes below,

ranging from pink ('working class comfort') through purple to the poverty classes of light blue, dark blue and black<sup>3</sup>.



Figure 2.1 Booth map of poverty in London, 1889, showing the East End, © Sabiha Ahmad July 1999.

A comparatively poor area in the West End of London was chosen as a second case study, due to its striking social and economic differences from its immediate surroundings. The area, broadly the geographical district of 'Soho', was defined as the streets south of Oxford Street, east of Regent Street, north of Coventry Street and west of Charing Cross Road. See illustration here (Figure 2.2), which shows that the Soho area had a large number of streets in the poverty tones of black, dark blue and light blue, framed by streets with red ('middle class') classifications. As shown by Breward (2006: 30) – in a section entitled 'Carnaby Street schmutter': "The stark difference between Marylebone, to the north of Oxford Street and Soho, to the south, was marked along architectural, ethnic, social and professional lines."



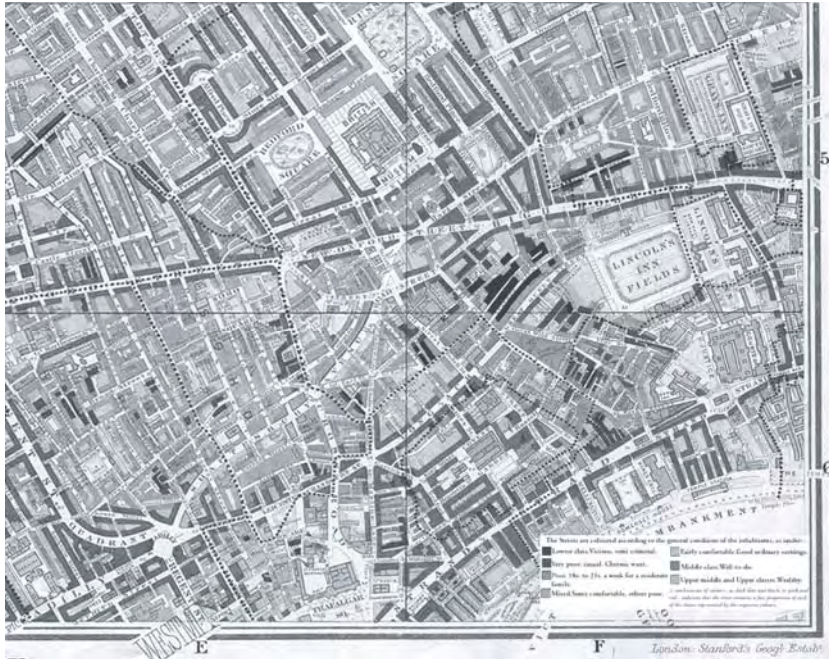


Figure 2.2 Booth map of poverty in London, 1889, showing the West End and Soho, © Sabiha Ahmad July 1999

This marked difference between the main streets and the interstices of the East End area corresponds to spatial analysis of the area. The graph (Figure 2.3) is coloured up according to the spatial accessibility at street segment scale (a street segment is the section between junctions, similar to a face of a US street block): based on a measure of the extent of street length reached at a set number of turnings away, considering the angle of incidence of the street junction. The segments are coloured in a colour range from dark to light – from integrated to segregated. In this case the computation stops at radius 4<sup>4</sup>. The analysis also suggests an explanation for the apparent segmentation of the district from its surroundings, with a highly dominant set of streets running east-west through the district, but few highly accessible north-south streets. The interstices have pockets of more segregated streets. In other words, the main streets within the area are not well connected to many of the main streets around the area; this might be an explanation for why the East End has consistently been thought of as a poverty area. Similarly, the Soho area (Figure 2.4), south of the very dominant east-west alignment of Oxford Street, is also poorly connected outwards.



Figure 2.3 East End 1889, Total segment length radius 4.

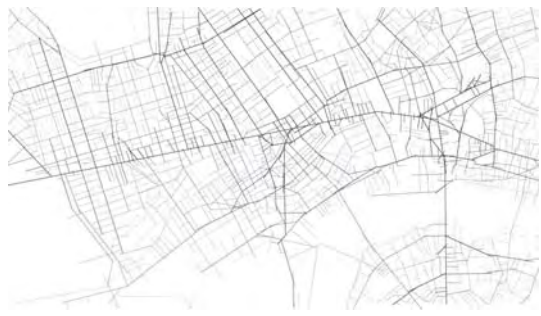


Figure 2.4 West End 1889, Total segment length radius 4.

**The Spatial Distribution of Poverty**

Stedman Jones (1971) shows in 'Outcast London' that the label of the area of London which became known as the 'East End', conjured up in people's minds a...

Nursery of destitute poverty and thriftless, demoralised pauperism, in a community cast adrift from the salutary presence and leadership of men of wealth and culture, and... a political threat to the riches and civilisation of London and the Empire (Stedman Jones, 1971: 15-16 in Fishman, 1988).

Although the East End had become a notoriously poverty area by the late 19th century, it is important to note that although Booth's statistics confirmed that over 30% of the East End population was poor, there were also more prosperous streets surrounding pockets of severe poverty. Fishman (1988) suggests that a 'major cause' of these perceptions was the 'accident of location "...one great effect of railway, canals and docks in cutting into human communities [is] a psychological one... East Londoners showed a tendency to become decivilised when their back streets were cut off from main roads by railway embankments"' (Fishman, 1988: 2, quoting from *The Nineteenth Century* XXIV, 1888: 262).

Booth himself highlighted the importance of physical boundaries in isolating 'poverty areas' and their inhabitants from the mainstream of urban life: "Another dark spot of long-standing poverty and extremely low life... is wedged in between the Regent's Canal and the gas works" (Pfautz, 1967: 113, quoting Booth)<sup>5</sup>. The reasoning behind this relationship might be lack of accessibility to place of work having an impact on poverty situation – not so much as where you live, but how where you live is connected to places of work in the area<sup>6</sup>. The following analysis considers the measure of local accessibility known as Radius 3 (local) integration<sup>7</sup> which previous space syntax research has shown corresponds reliably to the distribution of pedestrian movement flows (Hillier and Penn, 1996).

Spatial analysis of the 1889 map was made in relation to the Booth classifications, considering each segment in turn (cf. Vaughan et al, 2005b). Figure 2.5 indicates that there was a distinctive difference between average spatial accessibility for segments classified in the poverty range (the black, dark blue and light blue segments) and the remainder of the streets. In general, there was a relationship between greater accessibility and greater prosperity, with a large drop in integration between the streets defined as middle class and all others. What is also striking is that the most segregated poverty class is the light blue class of standard poverty, which Booth used to classify streets which are "inhabited principally by those whose earnings are small... whether they are so because of irregularity of work or because of a low rate of pay". The question arises why the poorest classes, were not quite as spatially segregated as the light blue class. There are two possible explanations for this: first, that the bottom two classes were the underclass of the time and therefore did not follow a spatial logic of the Movement Economy<sup>8</sup>. The second possible explanation is that the streets inhabited by the lower two classes were divided into two main types: the rookeries, in highly segregated locations and tenement houses that, had started off more prosperous (and in more accessible locations), but had fallen on hard times. Indeed, this is supported by statistical calculations of Entropy (as defined by Hillier et al 1987 and more recently Turner, 2001 as a measure of how ordered the system is from a location), which indicate that some poor streets were in small clusters isolated from higher-class streets, while other poor streets were adjacent, set behind or perpendicular to them.

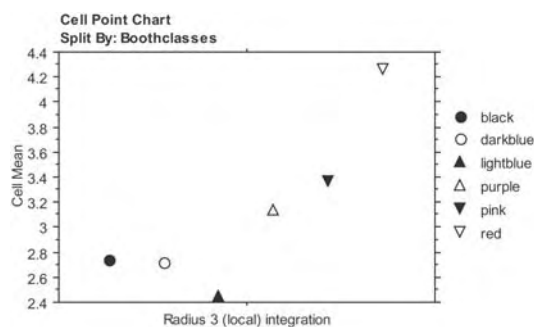


Figure 2.5 East End 1889: average axial integration per class (at street segment scale) – x axis shows classes from 1 to 6

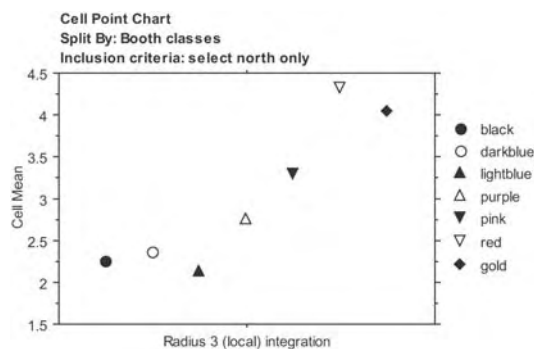
This pattern of correspondence between poverty and spatial segregation was found to continue at all the spatial scales, from local integration (each street in relation to those up to 3 turnings away), 5, 7, 9, 11, to global integration (all streets in the model). Statistical analysis of the numerical values of axial analysis values averaged by segment is displayed in Table 2.2, which shows the average values for radius 3 (local) integration and radius 7 (radius-radius)<sup>9</sup> integration for each class in the East End area as well as the average for all streets calculated at segment scale.<sup>10</sup> It is evident that all the poverty streets are less integrated than the average, whilst the more prosperous pink and red streets are more integrated than average. The differences are highly significant ( $p < .0001$ ) for the Black, Dark Blue and Light Blue streets. It is possible to conclude from this that there is a spatial definition of poverty which matches Booth's socio-

economic definition, with a poverty line<sup>11</sup> of spatial segregation that lies between the three bottom classes and the remaining streets.

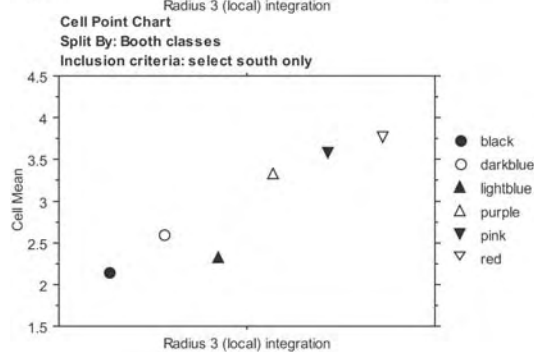
Class	No.	Local	Significance (p)	Radius 7	Significance (p)	Axial Length
Red	6	4.251	<.0001	2.000	<.0001	527.782
Pink	5	3.353	<.0001	1.771	<.0001	330.966
All streets	-	3.205	-	1.740	-	293.244
Purple	4	3.126	.0070	1.714	<.0001	256.775
Light Blue	3	2.444	<.0001	1.568	<.0001	176.869
Dark Blue	2	2.709	<.0001	1.640	<.0001	182.809
Black	1	2.732	.0001	1.656	.0017	189.715

**Table 2 Average axial integration per class (at street segment scale)**

The following analysis of the West End district was made in order to see if there were clear distinctions between the Soho district and the more prosperous area to the north of Oxford Street. Figures 2.6a and 2.6b compare the 1889 map averages of axial integration per class (at street segment scale) north and south of Oxford Street (excluding Oxford Street itself, which is highly integrated and pulls up the mean values for red, middle class streets, as shown in Figure 2.6c). (The scale of the graph has been locked to ease comparison.) In both cases there is a general trend of a rise in integration alongside a rise in prosperity similar to the pattern shown for the East End, above. It is notable that the integration values for the red ('middle class') streets are much higher in the area north of Oxford Street, whilst gold ('upper middle and upper' class) streets have an average value which is below the average red values in the north and very close to the average red values in the south (when Oxford Street is included, see Figure 2.6c, the values for streets classified as red are only marginally different from the north overall). The 'stepping back' of the gold streets, many of which formed part of squares, helps support a theory proposed by Bill Hillier<sup>12</sup>, that the tendency of the most prosperous squares in London is to remove themselves slightly from the main streets of the city, by having only one flank on the main spatial structure.

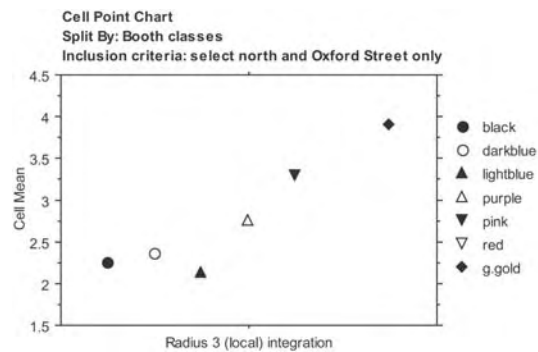


*2.6a. All streets north of Oxford Street, excluding Oxford Street.*



*2.6b. All streets south of Oxford Street, excluding Oxford Street.*





2.6c. All streets north of Oxford Street, including Oxford Street.

Figure 2.6 West End 1889: average axial integration per class (at street segment scale) – x axis shows classes from 1 to 6

Analysis of the morphological properties of the Soho area, such as block size, showed significant ( $p < .0001$ ) differences between Soho and surrounding areas – on average the length of street segments was 47.32 metres in Soho and 67.81 in Marylebone, not counting Oxford Street itself (which has very long segments). The affect of smaller block size is an intensification of the grid, with the ability to make more small-scale journeys. In cases where this is coupled with high levels of integration, this has been found to correspond to areas of intensified commercial activity (Hillier, 2001). This is explained by Penn (2003), who shows that “one of the primary effects of the built morphology and its use by people” is to enable movement, smaller blocks enable speedier journeys across the grid. Penn’s second effect is that the “morphology of the environment defines a local visual field and so defines the area from which one can derive visual information and within which one can potentially be considered visually co-present with others” (Penn, 2003: 62.12). In the cases here, smaller blocks are not coupled with large visual fields and high integration, so, the consequence effect is likely to be localised patterns of movement and social interaction, which do not engage as well with the larger scale built environment (and the larger patterns of socialisation). The critical difference from Hillier’s (2001) argument is that in those cases, city centres have grid intensification coupled with high integration. These findings help explain how both Soho and the East End emerged over time as poverty areas. It also helps explain how these areas have acquired a history of being the place of sub-cultures, whether of specific economic activities, specific markets or specific social groups.

### Immigrants and Poverty areas

The 10 years between Charles Booth’s two ‘Descriptive Maps’, were a period of great upheaval, particularly in the East End study area. This was due to a significant influx of (mainly Jewish) refugees from Eastern Europe, who arrived at the East End docks and rapidly found their way to the eastern edge of the East End, where an existing Jewish community and a burgeoning tailoring industry provided the necessary social and economic support required by this refugee group. Historical evidence suggests that the outcome of this influx was rental inflation, due to the willingness of the immigrants to live in extremely overcrowded conditions (Booth, 1902, Vol. IV, p. 59.)<sup>13</sup> The increase in rents also led to the displacement of some of the existing impoverished inhabitants of the area, who moved down river (eastwards) to seek cheaper accommodation, as Newman (1980) has shown. Not only was there significant social change at this time, but a large amount of slum clearance was taking place during this period, as described by Yelling (1986) and Gaskell (1990).

Due to the clear variations between the two maps, two separate spatial models matched with the corresponding Booth data were constructed. Initial analysis (see Vaughan et al, 2005a) of the changes to the East End area over time indicated that the slum clearances on the western edge of the East End had the effect of improving the overall economic situation of that area – but that this was an improvement which the incomers (rather than existing residents) were in a better position to take advantage of. There was a ripple-like effect of displacement of populations eastwards, with the outcome of shifting the worse off to the more inaccessible back streets and their replacement by a population that could afford the more expensive rent and in some cases strict housing regulations: “redevelopment had turned the social composition of the Flower and Dean Street area upside down, replacing unskilled with skilled labour” (White, 2003: 91).

Data on the spatial distribution of Jewish settlement in the East End was taken from a map published in a book written as a response to concerns about the influx of large numbers of refugee Jews in the 1880s and 1890s: ‘The Jew in London’ (Russell and Lewis, 1900). The map covers the entire Jewish population of the East End, but excludes minor settlement clusters outside the area, (such as in Dalston or Hackney). The

information included in the map (drawn by George Arkell, who also worked on Booth's maps of poverty) was based on information supplied by the London School Board and from the School Visitors of the Tower Hamlets and Hackney areas. As these are the same sources quoted by Booth in his writing about the East End, it is safe to assume that Arkell was drawing on the contacts and information he had acquired through his work for Booth. The information used to identify the location of Jews was based on forenames and surnames, names of schools attended, observance of holidays, etc. Similar to the Booth enquiry, information on homes containing children was extrapolated to include homes without children. Thus, the proportion of Jews in the homes without children was deemed to be the same as that in homes containing children, in the same street. The basic unit was a street, or street segment, in the case of longer streets. The map uses the following categories of Jewish density (proportion of the Jewish population to other residents of East London, street by street): 0-5%, 5-25%, 25-50%, 50-75%, 75-95%, 95-100%. The bands for the lower densities 0-50%, where Jews were a minority, were coloured in reds ranging from deep red, to light pink for the highest density. The bands for the upper densities 50-100%, where Jews were a majority, were coloured in blues from light blue, to deep blue for the highest density.

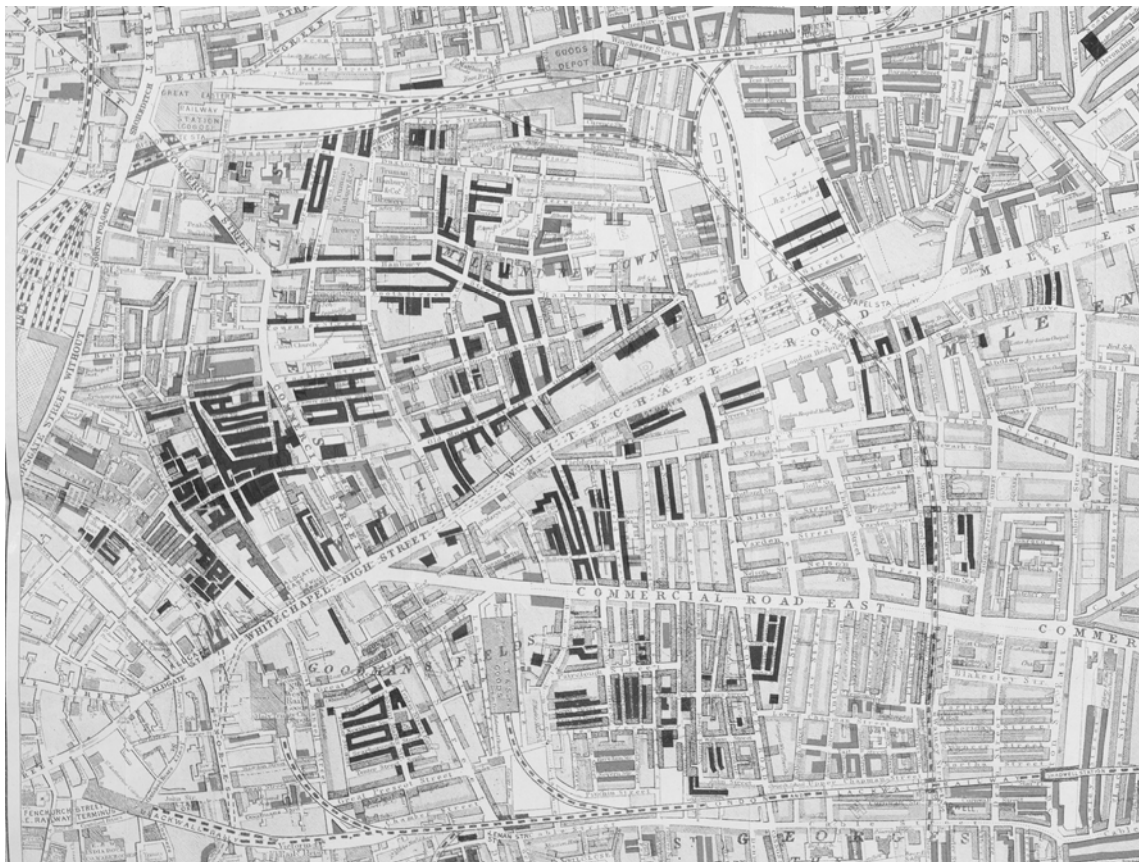


Figure 2.7: Section from 'The Jew in London' map 1899, courtesy Museum of London

The question addressed by this research is whether there is something particular about the nature of the life in poverty in a mixed, immigrant district. An examination of the Russell and Lewis data, which are the results of digitising the map classifications using the spatial database created for the Booth study, shows that there is a consistent pattern in the spatial location of immigrant settlement according to their proportion in the street ('density'). It is evident from studying the results of correlating immigrant density bands against local and global integration in Figure 2.8a and b respectively, that there is an increase in integration values to above the average for the area as density increases to the 50% mark, however integration values (and thus the potential for accessibility), decrease as density rises to the 100% mark. This is particularly the case for radius n (global) integration.

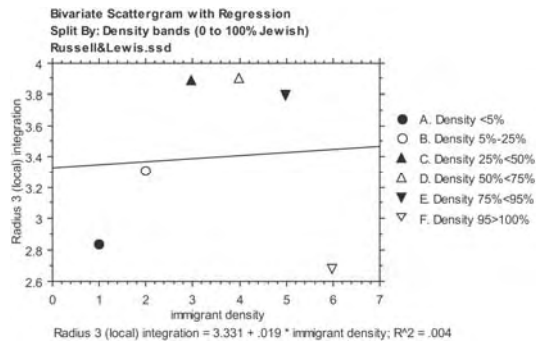


Figure 2.8a: Immigrant density correlated with Local integration

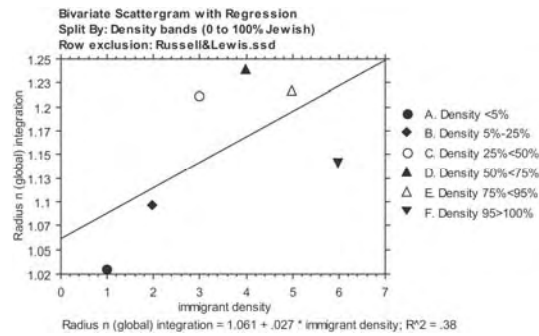


Figure 2.8b: Immigrant density correlated with Global integration

Bearing in mind that the streets most highly populated by immigrants were the back streets of the area, it follows that the distribution of poverty amongst densely populated immigrant streets should be analysed. An almost identical pattern to the distribution of integration is found when density is correlated with poverty (not surprisingly, as poverty has previously been shown to be closely related to spatial segregation). And in the univariate scattergram shown in Figure 2.9, we see that as density increases above the 50% mark, there is a marked decrease in Booth values of poverty, with the 95-100% immigrant streets having a Booth value ranging from 3.2 to 3.5 – namely falling at the high end of the poverty classes (where 1 and 2 denotes the very poor classes coloured black and dark blue and 3 is for the light blue classes).

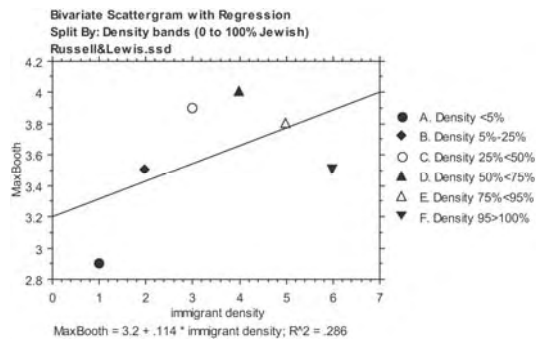


Figure 2.9: Univariate scattergram showing six density bands on the x axis, plotted against Booth classifications

In fact, this indicates that the immigrants were not located in the poorest streets, although some of the immigrant Jews lived in proximity to some of the poorest (gentile) streets of the area. Historical evidence suggests that the indigenous poor population benefited from living alongside the relatively more prosperous immigrant population. For example Davin (1996: 159), suggests that the mix of populations provided jobs which would otherwise not be available (she suggests there was less discrimination amongst Jewish immigrants, who were more likely to employ East End or Irish girls than other residents of the area).

## Conclusions

This paper has found a strong relationship between poverty and spatial segregation and contrariwise, between prosperity and spatial integration in 19<sup>th</sup> century London. There is evidence that the spatial segmentation of areas of the city can have detrimental effects on the most vulnerable populations, particularly those who are dependent on local movement and local networks of support and exchange. A statistical definition of a spatial ‘poverty line’ was proposed by the findings that showed the Booth poverty classes being situated in the most spatially segregated streets of the area.

Previous research by the author into patterns of immigrant settlement has suggested that the formation of immigrant quarters at the edge of urban business districts is a critical stage in the integration of immigrants into society (Vaughan, 2006). In fact, Carter (1983: 188) proposes that “ethnic areas, where immigrant populations adapted to a new culture and way of life, [become] distinctive sections of the industrial city.” Previous research has also shown that the location of immigrant quarters has historically been in the poorest districts of cities (Vaughan, 1999). The poverty situation of immigrants is not only relevant to factors such as the availability of cheap housing and casual labour (both of which are important to enable first footings

in a new area), but also because poor districts have an additional characteristic, that they are typically spatially and socially areas of transition, where newcomers, aliens and the 'other' can exist on the edge of the heart of the city whilst they find their feet in a new culture. As pointed out by Kershner (2004: 262), this is the case of the London immigrant quarter, the East End, which has been home to refugees for over 200 years. It is...: "a location...adjacent to the City of London, yet free from its restrictions, with a reputation for hosting nonconformity... a magnet for refugees and immigrants seeking economic opportunity and religious freedom." It seems likely therefore that the location of immigrant settlement close to the economic centres of a city is vital for their successful economic integration into the host society. Indeed, studies of historically successful immigrant groups show that the ability to connect with the economic centre through spatial proximity, coupled with support networks, helps create the foundations for economic activity and ultimately, economic mobility of people living in 'ghetto' areas. Recent research by Nasser (2004) sustains this contention, showing the successful transformation of Southall to support a "complex web of social relations and cultural affinities which manifest themselves in Southall's urban fabric". On the other hand, a pronounced separation from the economic centre can break this virtuous circle. The implication of these findings for planners and urban designers is that the dispersal of immigrants away from urban conurbations should be avoided. Moreover, the continuation of second generation immigrant clustering should not be viewed as a problem of 'ghettoisation', so long as other indicators of integration, such as education attainment and economic activity of the immigrant group are manifest.

The analysis here produced some new findings regarding the spatial form of cities. In particular, it was shown that Hillier's (2001) 'Centrality as a Process' theory can be supplemented by an understanding of how sub-areas of cities function in relation to their surroundings. The theory proposed here is that the spatial location on the edge of cities creates a springboard towards economic integration and ultimately, acculturation or social integration. The role of commerce and the markets as the first point of exchange between immigrant and host society was of vital importance. But of equal importance is the internal organisation of the spatial concentration, which can enable internal intensification of communal activity, socialisation, networking and self-support. The argument is that clustering - in particular strategic locations economically - is a necessary step in immigrant settlement. The analysis has shown that the perception that 'community' has only one dimension - complete intermixing of different cultural and ethnic groups can be replaced by a more subtle definition of simultaneous membership of a variety of 'communities' (see also Vaughan, 2006).

The analysis of change over the 10 year period showed a general improvement of poverty situation in areas which had slum clearances. By studying data for the same area in the form of a snapshot taken twice, ten years apart, the research has shown the impact of small-scale changes in the urban fabric. Indeed, a more complex situation emerges from a detailed study of the history of the area and its social transformation over time. The improvement of spatial accessibility did not necessarily improve the situation of the inhabitants of the area. In fact, the outcome was for the poorest of the population to move onto worse areas more distant from the economic centre. It is evident from studies such as those by Lupton (2003b) that only when spatial improvements are coupled with targeted social improvements, can genuine positive outcomes emerge from redesigning poverty areas.

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<sup>2</sup> The notebooks are available on the Booth website provided by the London School of Economics (<http://booth.lse.ac.uk/>).

<sup>3</sup> See colour reproductions of the Booth maps at <http://www.umich.edu/~risotto/imagemap.html> for the 1889 map and <http://booth.lse.ac.uk/> for the 1899 map.

<sup>4</sup> In space syntax analysis, as well as measuring accessibility between each street (or in segment analysis, street segment) to all other streets, known as 'radius n', analysis can be applied at different urban scales by restricting the radius at which it is applied. The radius refers to the number of steps in the mathematical graph, or in spatial terms, the number of turnings away from each point of origin.

<sup>5</sup> A close reading of Booth's extensive writings reveals that one important aspect of his work was his finding that urban morphology can have an impact on people's lives. Scattered through his writing are comments such as "Thus... the 'poverty areas' tended to be literally walled off from the rest of the city by barrier-like boundaries that isolated their inhabitants, minimizing their normal participation in the life of the city about them... (in Pfautz, 1967: 120).

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<sup>6</sup> Pfautz (1967, 116) points out that for Booth, the factor "... especially decisive in determining the class of residents... might be situation, in contrast to site".

<sup>7</sup> See above note 4 on the definition of radius in space syntax analysis.

<sup>8</sup> The movement economy theory (Hillier and Penn, 1996), stems from the natural movement theory (Hillier et al, 1993) and postulates that the spatial distribution of movement is part of a powerful mechanism by which cities organise their movement-seeking land uses such as shops in relatively integrated locations and uses which have lower requirements for movement, such as housing, in relatively segregated locations.

<sup>9</sup> Radius-radius integration is used here to approximate global integration without 'edge effect'. 'Edge effect' describes the fact that the edge of axial models tends to seem segregated due to the fact that streets on the edge of the map are not connected onwards. It is calculated by measuring integration up to x changes of direction away, when x is the mean depth from the most integrated line in the system.

<sup>10</sup> 'Segment scale' refers to the fact that mean axial spatial values were calculated for all street segments broken down by Booth class.

<sup>11</sup> Gillie (1996) shows that Booth described a line of poverty between those who were 'in poverty' and those 'in comfort'. In fact, there is no mention in his writings of an actual 'poverty line', a concept which came about in later days by Joseph Rowntree, starting with his classic study of York.

<sup>12</sup> Personal communication with the author, August 2005.

<sup>13</sup> White (2003: 61) also states that "In the ten years after Rothschild Buildings were first occupied, it was said that rents in the Jewish quarter had nearly doubled - at a time when wage rates were rising only slowly... Such an increase in the cost of living space reflected the growth of demand for a static or declining amount of housing accommodation. "See also Russell and Lewis (1900), Newman (1980) and Vaughan (1994) for more on the history of Jewish settlement in the East End. The spatial form of the map in relation to Jewish immigrant settlement patterns was analysed in detail in Vaughan, 1994.