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# The Socio-Demographic Spatial Structure of Dublin in 1981

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*Abstract:* The small area statistics of the 1981 Census of Population are analysed with a view to identifying the spatial patterns associated with the socio-demographic structure of Dublin. Factors identify the Socio-Economic Status structure; the Family Status (on stage in the life cycle) structure; the New Residential Areas (which result from post-1971 planned growth) and the Rented Sector. The factors are described and mapped, indicating the varied spatial structures of these differentiating characteristics of the city. The policy implications of these patterns are discussed. The problems of infrastructural resource allocation are commented upon, particularly in the context of Dublin's highly segmented geography of family status.

## I INTRODUCTION

The recent availability of the small area statistics from the 1981 Census of Population enables a much finer spatial scale of analysis of socio-demographic information to be undertaken within the Republic of Ireland than at any time since the 1971 Census of Population. The small area statistics from the latter census provided the basis for an analysis of the social structure of the city of Dublin by the present authors (Brady and Parker, 1975). This paper addresses the situation in the city as of 1981, with a view to identifying the spatial patterning of underlying socio-demographic structures in Dublin. It is divided into four sections; the first section briefly reviews the background to geographical research in urban social structure. The next section provides an overview of Dublin's socio-spatial structure as identified by Brady and Parker (1975) in 1971 and several subsequent papers, and comments upon the growth of the city since that date. The following section of the paper analyses the situation in 1981, whilst the final section provides a concluding overview.

## II OVERVIEW OF SOCIO-DEMOGRAPHIC SPATIAL STRUCTURES

The complex social and demographic mosaic that makes up most cities has a number of important societal implications. Where different groups of people live relates directly to the varying demands for infrastructural and other facilities and is, in part at least, a direct result of physical land-use planning policies. The construction of large areas of similar types of housing appealing to people of a similar social status and at a similar stage in the life cycle will result in heavy demand for certain types of infrastructural facilities at any given point in time. As the population and therefore the area ages, different types of facilities will be required bringing different pressures upon the urban system. By way of example, the development of a large number of 'starter' homes in a particular area will result within a few years in a substantial number of young children and a consequent demand for health care clinics, pre-schools and primary schools. As time passes there will be greater demands for secondary schools and local employment opportunities, and in the long term the situation will change, for example, in terms of educational infrastructure, from one of the underprovision of educational facilities to one of educational overcapacity.

A further instance of the implications of the varying socio-demographic mosaic of the city is that the class structure of different areas of the city, with differing employment and unemployment profiles will create varying levels of demand for retail facilities, for entertainment and leisure opportunities and the many other facets that go to make up the urbanite's daily lifestyle. Such spatial variations will therefore have important implications for a wide variety of business and public investment decisions. One such instance is accessibility to services such as primary medical care. Knox (1978) has shown that there are wide variations in the provision of primary medical care between the various social areas of Edinburgh and Glasgow. The provision of all these facilities requires the allocation of scarce resources and the careful planning of the future geographies of the urban area.

However, knowledge of the present-day spatial and structural patterns of the urban area's social geography is a necessary prerequisite to studying the processes at work in the city and to making rational long-term policy decisions. The present paper therefore analyses the 1981 Census of Population small area statistics for the Dublin built-up area with a view to identifying the underlying socio-demographic structures of the city and the spatial patterning of these different structures. The paper also provides a basis for the future analysis of the changing nature of the socio-demographic structure of Dublin, since in order to evaluate the implications of past policies, the extent of changes within urban social areas needs to be examined. In the context of published data in the Republic of Ireland, this can only be accomplished by a comparative analysis of

the 1971 and 1981 Census of Population small area statistics, which will form the topic of further research.

Studies of the socio-demographic structuring of the city not only have an applied role in planning provision but also provide useful insights into the extent to which cities conform to observed patterns elsewhere. Research on urban socio-spatial structures began early in the present century with the work of the Chicago school of human ecologists and developed through the social area analyses of Shevky, Williams and Bell (Shevky and Williams (1949); Shevky and Bell (1955)) to the factor ecological studies that became a major research thrust of urban social geography during the 'sixties and early 'seventies. Yeates and Garner (1976, p. 252) note that "the immediate utility of the ecological approach was that the processes pertained to groups rather than individuals and therefore could be applied to groups of people that are collected by the census into recording units of one kind or another". Subsequent work utilised such data to define communities within urban areas through the methodology of social area analysis. They suggested that as society became more urbanised with the move away from a rural base to an urban-industrial base, the social complexity of society increased, particularly in the context of economic status, family status and ethnic status. It has been generally suggested that these three dimensions take on different spatial expression in urban areas: economic status (or social class) taking on a sectoral pattern; family status, which has often been interpreted as 'stage in the life cycle', taking on a concentric pattern; and ethnic status taking the form of segregated nodes within the city and being most noticeable in North American urban areas (see, for example, Murdie, 1969).

Within the last two decades there has been widespread application of factor analytical techniques to study the socio-demographic structure of cities throughout the world and such studies have generally been termed 'factorial ecologies' (Rees, 1971). The utilisation of such techniques means that a substantially larger set of variables can be included in the analysis of urban social structure than those utilised by the social area analysts and the extension of social area analysis into factorial ecology has been reviewed by Johnston (1971) among others, and noted by the present authors (Brady and Parker, 1975). Overviews of factorial ecology have been provided in a supplement to *Economic Geography* in 1971, notably by Berry (1971), and most recently by Davies (1984), whilst Rhind (1983) has provided a commentary on aspects of the analysis of census data and small area statistics. Apart from those analyses noted in the 1971 factor ecological study of Dublin (Brady and Parker, 1975), more recent factorial ecologies have included Davies' work on Calgary (Davies, 1975), Edmonton (Davies, 1978) and Cardiff (Davies, 1983), as well as temporally comparative analyses of individual cities by Lo (1975) on Hong Kong and by Davies and Healey (1977) on Calgary. Inter-urban comparisons have also been undertaken

in Australia (Houghton, 1975) and Alberta (Davies and Welling, 1977) and by O'Neill (1976) for Cork, Limerick and Waterford based on the 1971 Census of Population.

## III DUBLIN'S SOCIO-SPATIAL STRUCTURE IN 1971

There have been four published analyses of Dublin's socio-spatial structure as of 1971, all with somewhat differing objectives and utilising varying methodologies, but all basing their data inputs on the small area data of the 1971 Census of Population and examining the spatial patterning of the 196 or so wards of the continuous built-up area. In 1975, Brady and Parker published a factorial ecology indicating the basic socio-demographic dimensions of the city, whilst during the following year Breathnach (1975—76) undertook a factor analysis as part of a study of educational priority areas in Dublin. Hourihan's (1978) study of social areas in Dublin also undertook a factor analysis as a prelude to integrating the resultant axes by cluster analysis to identify distinctive groups of social areas, whilst Bannon, Eustace and O'Neill (1981) utilised a two-stage cluster analysis to identify social areas and social sub-areas in the city for their NESC study of growth and decay in Dublin.

Brady and Parker's (1975) analysis identified five factors, based upon 56 variables from the Census of Population, which related to housing conditions-twilightism, socio-economic status, family status, residual communities and professionalism, the latter two being more minor factors with professionalism as a sub-set of socio-economic status. The analysis commented upon each of these factors separately, illustrating them in cartographic form and indicating that on the first factor, housing conditions-twilightism was concentrated particularly in the south inner city and Pembroke-Ballsbridge area and extended along the coast to Blackrock, Dun Laoghaire and Dalkey. These areas contrasted with the much more modern housing of the urban periphery, particularly throughout much of the northside of the city but also in the western areas.

However the socio-economic factor demonstrated the considerable differences between areas that loaded similarly on the housing conditions factor. For example, the south inner city and Pembroke-Ballsbridge varied noticeably in terms of the social class of residents, while the newer housing areas of the northern fringe identified by the housing conditions-twilightism factor were shown to comprise areas of different socio-economic status. A notable feature of the class structure of Dublin was the presence of the 'Liffey corridor', a band of low status territory on both sides of the river extending inland to the lower socio-economic areas of the public housing estates on the western side of the city. In general many of these areas, because of their relative maturity, did not possess a

youthful population as identified by the family status factor. Rather parts of the northern fringe and particularly a large tract of territory from Templeogue through to Ballybrack highlighted the peripheral nature particularly of young family structures in Dublin in 1971. Conversely, heavy concentrations of 'mature' family status occurred in the south inner city and Ranelagh-Rathmines areas, areas which together with much of the north inner city, parts of the 'Liffey corridor' and the coastal belt from Sandymount to Dalkey also scored heavily on the fourth factor, residual communities, which emphasised inter-war housing and an aged population. This coastal belt also scored heavily on the professionalism factor, together with parts of the southern fringes of the city from Dalkey to Rathfarnham as well as northern areas such as Howth and Clontarf.

Breathnach's (1975-76) assessment of educational priority areas (EPAs) only utilised 9 variables, four of which formed a poverty factor and which were subsequently used to rank the wards of the city to identify EPAs. These 4 variables comprised labouring and transport occupations, the unemployment rate, households with over 7 persons and car ownership, the latter being inversely related to the other 3 variables. Whilst the factor is not mapped, Breathnach does include a map of wards ranked on these key poverty variables and the Liffey corridor is evident together with other census tracts that have substantial proportions of local authority housing.

Hourihan's (1978) identification of social areas utilised 46 of the Census variables in an initial factor analysis, which resulted in five factors: socio-economic status, a life cycle dimension, a housing dimension and two further life-cycle components. Although not described in detail, there is sufficient evidence to indicate that whilst not utilising exactly the same set of variables as Brady and Parker, Hourihan's socio-economic status component identifies similar areas as being of low status and high status as those identified by the earlier analysis. Similar patterns appear to emerge in terms of the life cycle component compared to the family status factor of Brady and Parker with the peripheral location of the youthful population being evidenced and Ballyfermot being remarked upon by both analyses as being relatively mature in terms of the life cycle. By contrast the housing factors differ between the two studies, probably because of differences between the variables included in the analyses.

Hourihan groups these axes of differentiation by cluster analysis to produce 7 social areas which he terms the inner city, comprising two clusters of the city centre and 'the zone in transition'; a cluster termed the area of young unmarrieds, which corresponds closely to the city's flatland areas; a cluster termed the corporation estates, which occur particularly in the western and north-western areas of the city but with pockets elsewhere; and three clusters which he terms the suburbs. These include older suburbs to the north and south of the inner city area as well as parts of Blackrock and Dun Laoghaire; high

status suburbs notably Booterstown, Stillorgan, Foxrock, Killiney and Howth; and the rapidly expanding suburban fringe areas in the Rathfarnham-Templeogue, Blanchardstown and northern parts of the city.

Bannon, Eustace and O'Neill (1981), with a similar objective of identifying social areas, adopted a different methodological strategy, firstly cluster analysing 42 variables from the 1971 Census of Population to produce six groups of social areas and then subsequently cluster analysing each of these to produce social sub-areas. The six broad social areas identified by the study comprise inner city areas; twilight areas; flatland; old middle class suburbs; local authority suburbs and new owner occupied suburbs. Although different variables were utilised and different methodologies, there are certain areal overlaps between Hourihan's areas and those of Bannon *et al.* The inner city areas notably show broad correspondence between the two studies, whilst Hourihan's 'zone in transition' relates to the twilight areas of the subsequent study. There are also spatial similarities between the earlier study's area of young unmarrieds and Bannon *et al.*'s flatland cluster. Nevertheless there are differences between the studies, most notably in the wards included in the different suburban clusters. The cluster analysis technique seems suited to the purpose of Bannon *et al.*'s study, where the objective was to identify sample areas for a subsequent household questionnaire, but as a mechanism for solely identifying social areas it would seem to require a larger number of variables including measures of social malaise and economic well-being which are not available from the Census. By contrast, the factor ecological technique enables the *different* dimensions of the socio-demographic structure of the city to be identified both statistically and cartographically thus providing a basis for policies or further research related specifically to individual dimensions of the city's social structure.

In the ten years between the 1971 and 1981 Censuses of Population, the city grew considerably and the Dublin built-up area expanded substantially. The population of the Greater Dublin area, as defined by the Census, increased by 14.2 per cent to over 915,000, but the spatial distribution of population change varied considerably. The County Borough lost 7.4 per cent of its population during the decade, whilst Dun Laoghaire Borough only grew by 2.5 per cent. The northern suburbs, including the satellite town of Blanchardstown, expanded from some 25,000 to over 75,000 population, whilst the southern suburbs, which included the satellite towns of Tallaght and Lucan-Clondalkin, increased by over 100,000 people to a total of just in excess of a quarter of a million. Commuter communities developed beyond the built up area including Portmarnock, Malahide, Swords, Ashbourne, Leixlip, Celbridge, Maynooth, Greystones and even further afield (Hourihan, 1983). Inevitably these population changes have resulted not just in differences in population numbers

but also differences in the socio-demographic character of different parts of the city and commuter communities. Further changes in the socio-demographic structure of the city can be anticipated during the next two or three decades as a result of the growth predicted by both the ERDO Study (Eastern Regional Development Organisation, 1985) and by Davy, Kelleher and McCarthy (1985). In particular, the ERDO study forecasts a considerable expansion of the city with most of the future growth of the city accommodated in the towns around Dublin. This has serious implications not only for the provision of facilities but also for the future of the existing built-up area.

## IV THE FACTORIAL ECOLOGY OF DUBLIN IN 1981

In many respects it is regrettable that the full small area statistics of the Census of Population for 1981 have only recently become available, for considerable changes have clearly occurred since that Census was taken. Nevertheless, the data do allow the most up-to-date, detailed-scale analysis to be made of the underlying socio-demographic structures of the continuous built-up area. The 1981 Census of Population contained substantially more information than the 1971 Census, some 800 data items compared to 400 data items, which provide a broader range of variables from which to select inputs into a factorial ecology. New data include, for example, the primary fuel used to heat the home (see Brady, 1986), whether houses have central heating and the number of family units with children in different age categories. Unfortunately, not all of the information collected in 1971 was replicated in the 1981 Census, nor have all definitions remained the same. This makes direct comparison between the 1971 factorial ecology and the current study quite difficult. (The temporal comparison will form the basis of a subsequent study utilising a common set of variables). Furthermore, some of the information is almost too detailed for a factorial ecology, while the large range of variables available from the latest Census means considerable duplication among certain socio-demographic measures and hence necessitates careful choice of variables.

The range of variables chosen for a factor analysis is very important since it will determine the nature of the factors which will emerge. Therefore it is very important that variables are chosen which cover as wide a range of the social, economic, demographic and housing attributes of the city as possible. However it is important that there should not be an overconcentration upon any one broad dimension. Therefore variables which were essentially surrogates of other variables were excluded. The number of variables chosen is less important, for as Perle has pointed out "ecological structure at one point in time is little affected by the number of variables used" (cited in Davies, 1984, p. 107). The argument

in favour of using a large number of variables is that it gives a greater insight into the structure of each of the factors aiding the interpretation of the underlying axes of differentiation.

Fifty-four variables were eventually selected for inclusion in the factorial ecology. The variables are listed in Table 1 and include measures of the age structure, marital status and fertility of the population; household size and stage in the life cycle of family units; levels of education, social class and employment structure of the population; housing tenure and age of housing; and housing facilities including the primary form of heating. Although these variables represent a wide range of indicators, there are still deficiencies in the extent of the data provided by the Census particularly in relation to measures of the "well being" of the population.

Those variables categorised in Table 1 under the heading 'Age and Marital Status' will differentiate between the demographic structures of newer and older residential areas of the city, with the single people over 17 years of age variable highlighting flatland areas. Multi-household dwellings and small households, both in size and numerically, will also highlight such areas, whilst other variables included in the category 'Household Size' will identify areas of varying social status and stage in the life cycle as well as indicate degrees of overcrowding which are related to housing type and tenure as well as social class. Older and newer family residential areas will be differentiated by the life cycle structure variables which have implications for differing infrastructural needs related to different types of families. Educational attainment, social groups and employment structure variables will interrelate and identify the social status of different parts of the city, cross-cutting with the demographic and housing variables. The presence of a student population, the importance of married women in the workforce and the extent of those households without anyone at work are incorporated into the analysis alongside more traditional employment variables to indicate the changing character of societal employment structures. Housing tenure and facilities will indicate varying social areas of the city, incorporating elements not only of local authority planning and housing policies but interrelating with the age of housing variables which will identify the newer and older residential areas of the city.

Concern has been expressed in the literature (Davies, 1984) about the method of calculating the various indicators. It has been shown that closed number sets should be avoided where possible and that the denominators used in scaling the data should be varied to reduce the problem of spurious correlations. For the present analysis the variables were expressed as proportions of the most appropriate base figures and the data calculated for the 200 District Electoral Divisions (DEDs) which constitute the continuous built-up area of Dublin.

A principal axes analysis was undertaken on the data set utilising a varimax

Table 1: *Variables included in the Factorial Ecology*

*Age and Marital Status*

1. Population under 19 years of age
2. Population over 64 years of age
3. Single People over 17 years of age
4. Married People
5. Fertility Ratio: Children 0–4 years as a proportion of 15–45 year old Female Population

*Household Size*

6. Persons per Household
7. Persons per Room
8. One and Two Person Households which are not Family Units
9. Two Person Household Units
10. Household Units with more than 9 People
11. Households in Multi-Household Dwellings
12. Households with less than Three Rooms

*Life Cycle Structure*

13. Family Units with at least one child aged 0–4 years
14. Family Units with the youngest child in the 5–14 age group
15. Family Units with the youngest child over 15 years
16. Family Units with No Children
17. Households with One or Two People aged over 64 Living Alone

*Educational Attainment*

18. Primary Level Education
19. Vocational Level Education
20. Secondary Level Education
21. Higher Level Education

*Social Groups*

22. Higher Professional
23. Lower Professional
24. Employers and Managers
25. Salaried Employees
26. Other Non-Manual Workers
27. Skilled Manual Workers
28. Semi-Skilled Manual Workers
29. Unskilled Manual Workers

(Table 1 *continued*)

Table 1 *continued*

*Employment Structure*

30. Population aged 15 and over at Work
31. Population aged 15 and over Unemployed or Seeking First Job
32. Students in the Population aged 15 and over
33. Population aged 15 and over that is Retired
34. Unemployed under 25 year olds in the Workforce
35. Labour Force at Work
36. Males in the Workforce
37. Married Women in the Workforce
38. Married Women as a Proportion of Employed Women

*Housing Tenure*

39. Housing rented from the Local Authority
40. Housing rented unfurnished, not from the Local Authority
41. Housing rented furnished
42. Housing being bought from the Local Authority
43. Housing being bought by Mortgage
44. Owner Occupied Housing

*Age of Housing*

45. Housing built prior to 1919
46. Housing built between 1919-1940
47. Housing built between 1940-1970
48. Housing built since 1970

*Housing Facilities*

49. Households with a Bath
50. Households with Hot Water
51. Households using Solid Fuel heating
52. Households using Electric heating
53. Households using Oil heating
54. Households with Central Heating

rotation to simplify the structure. It was decided only to extract those factors which explained more than 5 per cent of the variance of the data in order to keep the number of factors to manageable proportions and as Table 2 indicates, four factors collectively explained almost 78 per cent of the variation with the first

Table 2: *Explanatory Powers of the Factors*

| *Component* | *Percentage Individual Variance Explained* | *Cumulative Percentage Variance Explained* |
|---|---|---|
| 1 | 34.5 | 34.5 |
| 2 | 30.1 | 64.7 |
| 3 | 7.7 | 72.4 |
| 4 | 5.4 | 77.8 |

two explaining 34.5 per cent and 30.1 per cent respectively. Each factor was analysed in terms of its variable loadings, with loadings of less than ±0.4 being excluded from consideration and scores were calculated for each District Electoral Division for each of the factors. The scores for each area were then assigned to one of six categories by means of a cluster analysis to enable each factor to be mapped. The cluster analysis aimed at minimising the internal variation in each of the categories while maximising the variation between the categories.

*Socio-Economic Status*

Factor 1 characterises the Socio-Economic Status of Dublin and Table 3 indicates the variables with the ten highest loadings, other loadings in excess of ±0.4 also being considered in the following discussion. Social Group variables are clearly differentiated on this factor, as would be expected, with areas of the city that have high proportions of the population classified as belonging to the Employers and Managers, and Salaried Employees social groups contrasting with the spatial distribution of the Semi-Skilled Manual Workers and Unskilled Manual Workers. All the other social group variables also load strongly on this factor. Skilled Manual Workers (-0.654) and Other Non-Manual Workers (-0.847) load negatively while Higher and Lower Professional both load positively (+0.780 and +0.810 respectively). The 'Employment Structure' variables listed in Table 1 bear out the contrasts between higher and lower status areas, with the former having higher proportions of the Labour Force at Work and lower proportions of those who are unemployed or seeking their first job. Areas with higher proportions of Students in the Population (+0.709) and Married Women in the Workforce (+0.528) also load positively on this factor, indicating higher status areas. Lower social status areas of the city are represented by the converse of these attributes as well as higher proportions of Unemployed under 25 year olds in the Workforce (-0.851).

Strong contrasts also exist among other categories of variables. Educationally

Table 3: *Factor 1: Socio-Economic Status Variables with the ten highest Loadings over ±0.4*

| | *Variable* | *Loading* |
|---|---|---|
| 28. | Semi-Skilled Manual Workers | -0.942 |
| 20. | Secondary Level Education | +0.940 |
| 18. | Primary Level Education | -0.938 |
| 29. | Unskilled Manual Workers | -0.910 |
| 7. | Persons per Room | -0.898 |
| 31. | Population aged 15 and over Unemployed or Seeking First Job | -0.898 |
| 35. | Labour Force at Work | +0.889 |
| 24. | Employers and Managers | +0.880 |
| 25. | Salaried Employees | +0.867 |
| 34. | Unemployed under 25 year olds | -0.851 |

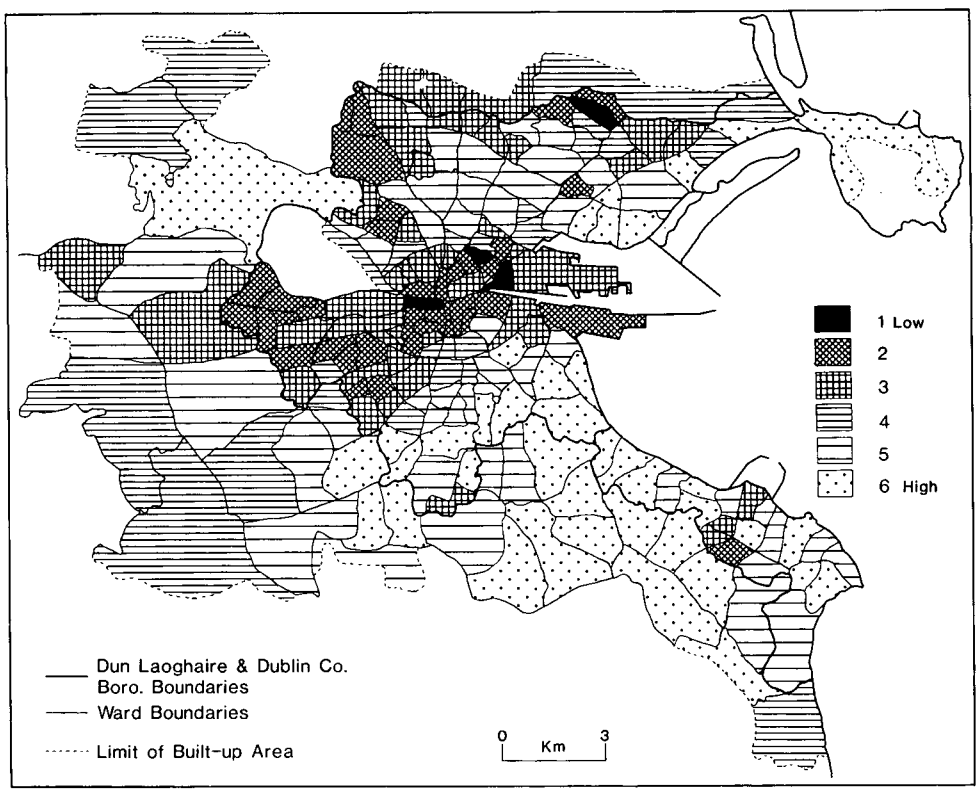
lower status districts are characterised by higher proportions of the population having only Primary Education or Vocational Education (-0.540); whilst higher status areas of the city are characterised by people with Secondary Education or Higher Education (+0.846). The former areas are also characterised by overcrowding as indicated by the high negative loading of Persons per Room variable.

Although not among the ten highest loading variables, many other variables which load strongly on this factor reinforce the social class dimensions of Dublin. Negative loadings are characteristic of lower social status while positive loadings are associated with higher status areas. Included among the indices of low socio-economic status are Housing rented from the Local Authority (-0.820); Housing using Solid Fuel Heating (-0.758); Household Units with more than 9 people (-0.546) and Housing being bought from the Local Authority (-0.476). Higher status areas are characterised by higher proportions of housing being bought by Mortgage (+0.528) or being Owner Occupied (+0.514) and pleasanter living conditions are characterised by high proportions of households having Central Heating (+0.731) and Heating by Oil (+0.727), and possessing both a Bath (+0.473) and Hot Water (+0.424).

Figure 1 indicates the spatial distribution of the scores on the Socio-Economic Status factor with a number of distinctive areas emerging. Very few DEDs form the lowest social class areas of the city with the majority grouped around the central business district. There is one outlier in Coolock which is a DED that comprises solely a large local authority housing estate. Other low status areas of the city occur particularly where there are other local authority housing estates,

notably in the northern and western suburban DEDs of Coolock, Artane, Finglas, Cabra, Ballyfermot, Drimnagh and Crumlin, together with a southside outlier in Sallynoggin. Large tracts of the inner city area are also of low socio-economic status including Arran and Inns Quays, the Mountjoy Square and Ballybough areas on the northside and the older parts of the south inner city including the Coombe eastwards to City Quay as well as the Ringsend area. It is noticeable that the belt of lower socio-economic status stretching along the 'Liffey corridor' remarked upon in the analysis of the 1971 Census of Population still exists.

Figure 1: *Factor 1: Socio-economic status*




The highest status area includes Howth, Sutton, Clontarf and Castleknock on the northside and a large tract of territory on the southside extending from Sandymount to Killiney and westwards to Templeogue including Donnybrook and Terenure as well as the more southern suburban areas of Blackrock, Stillorgan, Dundrum and Foxrock. With but a few exceptions, all DEDs south and east of a line from Sandymount to Greenhills are of higher socio-economic

status, whilst the new communities to the west of the city, notably Tallaght, Clondalkin, Blanchardstown and Clonsilla are all broadly of similar social status. These new communities in particular show a change in the spatial arrangement of the social class structure of Dublin compared to 1971, with local authority policies of an admixture of both public and private housing having something of an evening-out effect upon the socio-economic status of these areas.

In overview, the structure of the city tends to have lower status areas in the inner city with higher status areas to the immediate north and south. Whilst these higher status areas stretch to the edge of the built up area in the southern suburbs, on the northside the older, middle and higher status areas are 'sandwiched' by lower status areas along the northern fringe of the city. These lower status areas also extend to the west of the urban area although they predominate in the pre-'70s built-up area as the new western communities are generally of mixed social status. A degree of sectoring exists in Dublin but it has been confused by the greater admixture of social areas on the northside of the river and also by the development of the western towns.

*Family Status*

The second factor in the analysis relates to the Family Status in Dublin, indicating variations in stage of the life cycle. The development of different parts of the city through time and the operation of the property market result in people at broadly the same stage in the life cycle living in close proximity to each other. Factor 2 differentiates between those areas which are occupied primarily by families in the earlier stages of development — the stable areas — and areas of population decline and the ten highest loading variables on the factor are indicated in Table 4. The former areas are characterised by large household sizes with a high proportion of the population under 19 years of age. The youngest child in the family is often in the school going age group of 5-14 years. Such areas are also characterised by a higher proportion of housing built between 1940 and 1970. The other extreme are those areas of decline where there are high proportions of One and Two Person Households, Family Units with No Children, and Housing built prior to 1919. Such areas are also characterised by Households with less than Three Rooms — the classic 'flatland' areas of the city. However it must be stressed that such areas are more than just homes of transient flatdwellers, rather they also contain older people whose children have grown up and left home, such people often living in older housing which is eventually often sold for subdivision and rental as flats or bedsitters. This aspect is identified particularly by the Household with One or Two People aged over 64 Living Alone variable.

Those variables with loadings higher than ±0.4 which do not appear in Table 4 bear out this differentiation. The stable family areas are characterised by

Table 4: *Factor 2: Family Status Variables with the ten highest Loadings over ±0.4*

| | *Variable* | *Loading* |
|---|---|---|
| 6 | Persons per Household | +0.871 |
| 14. | Family Units with the youngest child in the 5-14 age group | +0.800 |
| 47. | Housing built between 194021970 | +0.792 |
| 1. | Population under 19 years of age | +0.783 |
| 8. | One and Two Person Households which are not Family Units | -0.775 |
| 9. | Two Person Household Units | -0.771 |
| 16. | Family Units with No Children | -0.762 |
| 45. | Housing built prior to 1919 | -0.741 |
| 17. | Households with One or Two People aged over 64 Living Alone | -0.708 |
| 12. | Households with less than Three Rooms | -0.654 |

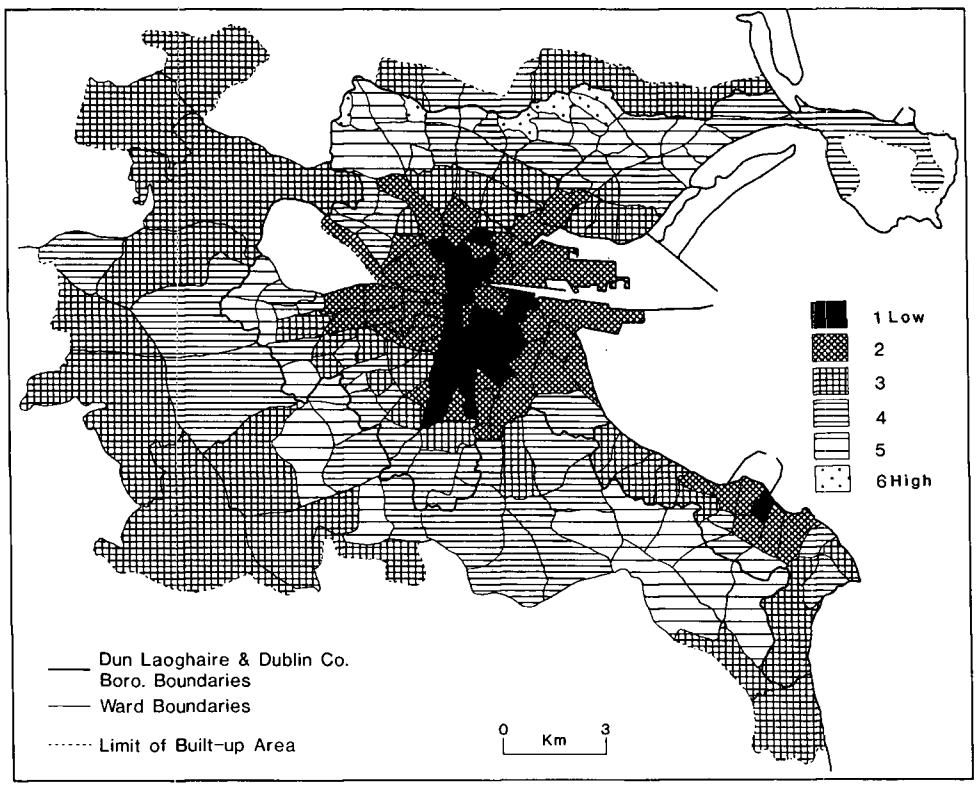
higher proportions of people with Vocational Education (+0.405) and Households with more than 9 People (+0.529) and with the basic facilities of Hot Water (+0.624) and a Bath (+0.621). However family type is undifferentiated by housing ownership with these areas characterised by housing being bought from the Local Authority (+0.546) or by Mortgage (+0.489). By contrast the 'declining' residential areas of the city are characterised by Multi-Household Dwellings (-0.615), Households with less than Three Rooms (-0.654), Single People over 17 years of Age (-0.580) and Population over 64 years of age (-0.654). Housing is often rented either unfurnished, not from the Local Authority (-0.639), or furnished (-0.431) with electricity often being the main form of heating (-0.547).

It is evident that this factor differentiates the city's residential structure in terms of stable and declining areas, but it does not strongly indicate the rapid growth that occurred during the decade to 1981 in areas such as the satellite towns of Tallaght, Lucan-Clondalkin and Blanchardstown and the expanding suburbs such as Ballybrack, Shankill and Coolock. At the time of the 1971 Census such communities were relatively small with the population expansion largely being a future planned development. As a result such areas fitted into the broad spectrum of the city as a whole from declining areas through to the more recent suburbs of the 1960s. By 1981, with the radical expansion of the new satellite towns and expanded suburbs along the northern and south-eastern

fringes of the city, the family status structure of Dublin had altered substantially compared to 1971. The city's structure had in some respects polarised into those 'established' areas where the population had largely stopped growing or had even begun to decline, as identified by Factor 2, and the new suburban areas associated with continuing growth and dynamism in the population; areas where many young families were still in the process of having children. However, within the 'established' city, Factor 2 does differentiate between stable and declining areas. At one end of the spectrum are those areas in the earlier stages of the life cycle, although none are at the beginning of the cycle, for such 'new' areas are largely concentrated in the satellite towns. At the other end of the spectrum are areas which are now in transition, areas of decline but with the future prospect of regeneration.

Family status has traditionally been seen as having a spatially concentric pattern reflecting the various growth stages in a city's development (see, for example, Murdie's (1969) study of Toronto). However as Figure 2 indicates, the spatial distribution of scores on the family status factor takes on a more varied pattern. This is largely because of the addition of the western towns and also the

Figure 2: *Factor 2: Family status*



newly expanding suburbs of the northern and south-eastern fringe. Nevertheless, these areas apart, elements of the concentric nature of family status, and concomitantly suburban growth, are identifiable. The new communities might well be regarded as an additional concentric zone although they do not fit into the structured nature of this dimension, largely because they are identified in a separate factor. A further noteworthy element is the degree of concentric zonation in Dun Laoghaire, based upon its development as a town in its own right.

Figure 2 indicates that the more stable areas comprise the fringe areas of the city at the time of the 1971 Census: Coolock, Kilmore, Beaumont, Finglas, Greenhills, Templeogue, Stillorgan, Foxrock, Deansgrange and Johnstown. The older, transitional areas are a combination of the classic flatlands of any city and the old population who represent the remnants of the families who once lived there. Such areas have completed the life cycle and on Figure 2 are indicated by a continuous tract of territory extending from parts of Glasnevin, Drumcondra and the north inner city through parts of the south inner city to Harold's Cross, Rathmines and Ranelagh. Many of the adjoining areas also exhibit the characteristics of such areas although not to such a great extent. A similar pattern also emerges in Dun Laoghaire where the family structure of the areas immediately adjacent to the town centre is characterised by its declining/flatland nature while the adjoining areas show similar characteristics, although these are less strongly developed.

Regeneration is likely to occur in these declining areas as the aged population dies out and the houses become available to younger purchasers. Many of the houses in these areas qualify for the recently announced housing improvement grants which makes them attractive to purchasers, particularly since they are located close to the amenities and workplace of the city centre. What increasingly may happen is that many first time buyers in the professional social classes move into these housing areas and in due course of time regeneration will occur as such people start to raise families. When the alternative is to live way out at the edge of the built up area with long journeys to work, then the attractions of these inner city/inner suburban areas are obvious. However although there are obvious attractions to purchasing housing in such areas there are also disincentives. For example, current Government policy with respect to second-hand houses means that not only does a purchaser have to pay stamp duty but a first time purchaser will lose the £5,000 grant which is paid if they buy a new house. Given that much of the housing stock is capable of being improved — which would generate jobs in the building industry — and the savings in terms of infrastructural costs on roads, schools, shopping facilities, etc, which already exist in these areas, then there would seem to be a case for a reappraisal of Government policy and the house improvement grants scheme may be an indication of future policy changes.

*New Residential Areas*

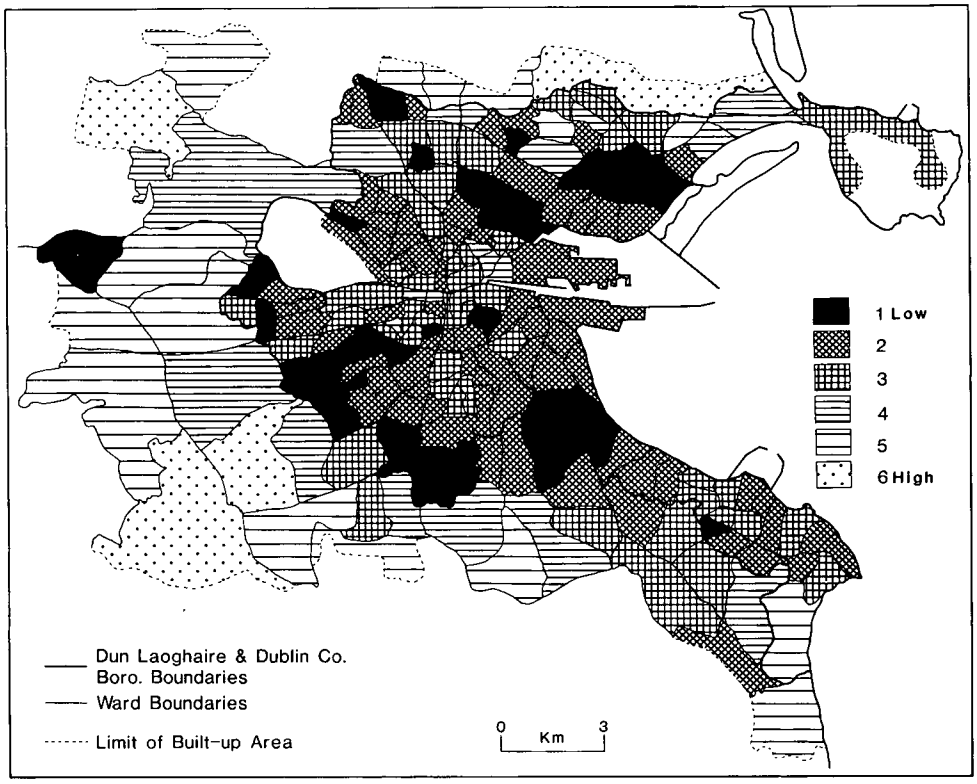
The new communities that have developed in the urban area between 1971-81 are identified by the third factor. As was noted in the context of Table 2, this factor accounts for a substantially smaller proportion of the overall variance than Factor 2, and in many respects it amplifies that latter factor. Table 5 indicates that the new communities are characterised in particular by high proportions of new and growing families where the youngest child is in the 0-4 age group and with low proportions of families with the youngest child over 15 years of age. Other characteristics of these growth areas include low proportions of the Population over 64 years of age and of Households with One or Two People aged over 64 Living Alone. A high fertility rate occurs in these parts of the city and high proportions of women working outside the home are also characteristic of such areas. Most of the housing has been built since 1970 and only low proportions were built between 1919 and 1940. There are low proportions of owner occupied housing which is hardly surprising considering the admixture of public and private housing, almost all of the latter being bought by mortgage. Variables not included among the ten highest loadings but still with loadings in excess of ±0.4 confirm the youthful nature of the population and the environment. There are low proportions of Single People over 17 years of age (-0.467) and of Two Person Household Units (-0.486). Conversely the new communities are characterised by higher proportions of Population under 19 years of age (+0.410), Males in the Workforce (+0.461) and, a characteristic of modern housing, Households with Central Heating (+0.457).

Table 5: *Factor 3: New Residential Areas Variables with the ten highest Loadings over ±0.4*

| | *Variable* | *Loading* |
|---|---|---|
| 15. | Family Units with the youngest child over 15 years | -0.913 |
| 13. | Family Units with at least one child aged 0-4 years | +0.906 |
| 48. | Housing built since 1970 | +0.776 |
| 5. | Fertility Ratio | +0.760 |
| 38. | Married Women as a Proportion of Employed Women | +0.728 |
| 2. | Population over 64 years of age | -0.647 |
| 44. | Owner Occupied Housing | -0.595 |
| 17. | Households with One or Two People aged over 64 Living Alone | -0.551 |
| 46. | Housing built between 1919-1940 | -0.546 |
| 37. | Married Women in the Workforce | +0.532 |

Recent planning strategy in Dublin has been to concentrate growth in the western satellite towns removing much of the substantial growth of population from the continuous built-up area. By concentrating young families, as identified by the major variables loading onto this factor, into these new towns to the extent that they dominate the population, a new structural element has been introduced in the city. In many instances these areas, together with a few along the northern fringe of the built-up area and, to a lesser extent, on the southern and south-eastern fringe of the city, have been the only ones to experience substantial population growth during the 1970s. This is illustrated by Figure 3, where the greatest growth areas comprise Tallaght and Blanchardstown together with the north-eastern fringe of the built-up area. By contrast most of the areas which were 'established' by 1971 load relatively poorly on this factor being characterised by the reverse of the variables noted above. Planning policies implemented during the 1970s have produced this highly identifiable structural polarisation of the city with important implications for infrastructural needs and developments. It is worth noting that the recent ERDO proposals

Figure 3: *Factor 3: New residential areas*



would continue this pattern by siting new developments yet further from the 'established' city.

The desirability of developing communities with a good mix of age groups as well as social classes has formed part of the British New Towns policy in the post-war period. It is desirable not only on social grounds since it has already been noted that social segregation leads to imbalances in the provision of facilities such as primary medical care (Knox, 1978), but also to ensure the efficient utilisation of infrastructural resources. Since different resources are required in varying magnitudes at different stages in the life cycle, a balanced population in terms of age structure will ensure the continued use of such resources through time. An area dominated by a people at the same stage in the life cycle though will lead to immense pressure for specific resources relevant to their current needs. A lack of a broad based population in terms of age will mean that such resources will rapidly become redundant. An obvious example is schooling. In areas such as the western towns, there is currently pressure for pre-schooling and primary schooling. Many large new primary schools have been built in Tallaght and there have been instances of schools operating a double shift with two sets of teachers and pupils. By contrast schools in the established parts of Dublin, some quite close to the western towns, are experiencing declining numbers. Some are busing children in from the western towns to keep up their numbers and retain their staff, others are either closing buildings or amalgamating. Within a decade the pressure for primary schools will have passed and the pressure will be on the secondary level. A decade later the western towns will have begun to stabilise as children reach adulthood and leave home, but the overprovision of primary and secondary schools will remain, presumably paralled by underprovision in some new growth area in the Dublin region.

*The Rented Sector*

The fourth factor identified by the analysis is a further extension of the family status dimension, but identifies in particular the rented sector of the city. As Table 6 indicates such areas are identifiable by their high proportions of Rented furnished accommodation of less than Three Rooms in Multi-Household Dwellings and using Electricity as the major form of heating. These households tend to be either one or two-person but are not family units. Socio-demographic characteristics of such areas include a lower proportion of Married People, of Males in the Workforce, of Married Women as a proportion of Employed Women and of Retired People. There are also higher proportions of Single People over 17 years of age in these areas. This Factor therefore identifies a specific sector of the rental market in the city; not those areas where decline and potential regeneration are taking place as indicated in Factor 2, but rather the very specific flatland areas of the city which are likely to have a mixture of young

Table 6: *Factor 4: Rented Sector Variables with the ten highest Loadings over ±0.4*

| | *Variable* | *Loading* |
|---|---|---|
| 4. | Married People | -0.812 |
| 33. | Population aged 15 and over that is Retired | -0.752 |
| 41. | Housing rented furnished | +0.722 |
| 52. | Households using Electric heating | +0.691 |
| 36. | Males in the Workforce | -0.648 |
| 12. | Households with less than Three Rooms | +0.645 |
| 3. | Single People over 17 years of age | +0.633 |
| 11. | Households in Multi-Household Dwellings | +0.624 |
| 37. | Married Women as a Proportion of Working Women | -0.537 |
| 8. | One and Two Person Households which are not family units | +0.525 |

and single people either in or out of employment. In contrast to the family status and new residential areas factors though, the importance of this factor in the city's structure is far less.

## V OVERVIEW

The socio-demographic structure of the Dublin built-up area has changed noticeably since 1971. Some of the differences in the composition of individual factors may be due to the use of different variables. However, it is evident that the housing factor identified clearly in 1971 has been subsumed into the social factors identified in 1981, perhaps as a result of the considerable house building programme undertaken by the Local Authorities during the decade. The structure of Dublin in the latter year takes on a broadly similar pattern to 1971 in terms of socio-economic status: areas which were high status in 1971 remain as such a decade later, whilst low status areas have not changed during the decade. What is new, of course, is the addition of the western communities and developments on the northern and southern fringes. The western towns are deliberately socially mixed and therefore betray no great dominance of any particular socio-economic groups, save for the high status Castleknock area adjoining Blanchardstown. The social character of the northern and southern fringe developments tend to parallel those of adjacent areas.

The major contrast that emerges by 1981 though is the life cycle structure of the city. Three factors identify aspects of family status and stage in the life cycle,

Factor 2 being the major family status factor, amplified by Factors 3 and 4. Factor 2 differentiates between the stable and declining areas of the city and shows the interrelationship between demographic variables and housing variables in particular. It contrasts those areas, which in 1971 were the growth areas of the city but which have since stabilised in their family status, and the inner city/inner suburban areas which are experiencing a combination of ageing population and traditional flatland. The new western communities do not fit into this particular classification in as much as they are very youthful, being areas of current and future population growth as couples move into their first home and start to raise families. Furthermore the final factor in the analysis identifies those areas of the city which are specifically bedsitter/flatland, amplifying one dimension of the family status characteristics identified in Factor 2.

In overview the socio-demographic structure of Dublin can be seen to operate in terms of two dimensions. The social class structure of the city has been relatively stable with the high status southern suburbs maintaining their dominance on the socio-economic scale over other parts of the city. In the northern suburbs only a few areas parallel the status of the large tract of high status southern suburbs; notably Howth, Sutton, Clontarf and Castleknock. Cross-cutting the socio-economic structure though is the family status dimension. For example, the high social class areas of the southern suburbs exhibit variations in terms of the stability of the life cycle dimension, ranging from the *relatively* youthful communities in the Stillorgan and Foxrock area to the declining family status of parts of upper-class Ballsbridge. Similarly low socio-economic areas of Dublin range between stable family status, as in the case of parts of Coolock, to the declining stage in the life cycle, in some inner city districts.

The implications of spatial variations in social class mean differential provision of resources in different areas of the city, creating differing residential environments. Higher status areas are likely to be pleasanter places to live with better shops and good recreational and infrastructural facilities. The lower status areas are likely to be less attractive environmentally, in the broadest sense, with poorer facilities. Also, social class differences expressed as variations in demand levels and disposable incomes affect not only the development of shopping and entertainment facilities but also the provision of public and private transportation facilities.

The major implications for infrastructural resource allocation though, particularly in the context of public infrastructural provision, come from the life cycle structure of the city. The highly segmented geography of family status in Dublin means that different areas have intensive demands for different kinds of resources at different periods in time. If such resources are fixed in the landscape then there soon comes a period when they are underutilised and the overutilisa-

tion of such facilities is elsewhere within the growing urban area. The provision of schooling has already been noted but other facilities include the provision of day-care and geriatric treatment centres at the two extremes of the life cycle. The problems of life cycle-related resource allocation are at their most intense in those areas where almost everyone is at the same stage in the life cycle. Whilst the new western communities are the most obvious geographical example of the problem, many other parts of the city also suffer from a highly homogeneous population in terms of family status simply because of the way in which the city has developed particularly since the 1940s. The newly developed communities of the 1940s became the stable communities of the 1960s and have started to become the declining communities of the 1980s, with at each stage, demands for different facilities.

Overlaying the socio-economic structure of the city onto the family status structure will produce a typology of social areas. Each social area so defined will be a particular combination of class and family types with needs and demands for different kinds of facilities. The identification of these areas illuminates the spatial implications of past, public and private decisions and should enable more meaningful decisions to be made in the future. Furthermore the study has highlighted the future possibilities of the older residential areas of the city and the resource allocation problems implicit in continuing to pursue a residential development policy in the urban region such as that of the last ten to twenty years.

*REFERENCES*

BANNON, M. J., J. G. EUSTACE and M. O'NEILL, 1981. *Urbanisation: Problems of Growth and Decay in Dublin,* NESC Report, Dublin.

BERRY, B. J., 1971. "Comparative Factorial Ecology: Introduction", *Economic Geography* (Supplement), Vol. 47, No. 2, pp. 209-219.

BRADY, J. M., 1986. "The Impact of Clean Air Legislation on Dublin Households", *Irish Geography,* Vol. 19, Pt. 1, pp. 41-44.

BRADY, J. M. and A. J. PARKER, 1975. "The Factorial Ecology of Dublin: A Preliminary Investigation", *The Economic and Social Review,* Vol. 7, No. 1, pp. 35-54.

BREATHNACH, A., 1975-76. "Towards the Identification of Educational Priority Areas in Dublin", *The Economic and Social Review,* Vol. 7, pp. 367-382.

DAVIES, W. K. D., 1975. "A Multivariate Description of Calgary's Community Areas", in B. Barr (ed.) *Calgary, Western Geographical Series,* No. 11, University of Victoria, B.C., pp. 231-269.

DAVIES, W. K. D., 1978. "The Social Taxonomy of Edmonton's Community Areas in 1971", in P. Smith (ed.). *Edmonton, Western Geographical Series,* University of Victoria, B.C., pp. 161-197.

DAVIES, W. K. D., 1983. "Urban Social Structures: A Multivariate Structural Study of Cardiff and its Region", University of Wales Press, *Social Science* Monograph 8.

DAVIES, W. K. D., 1984. *Factorial Ecology,* Aldershot: Gower.

DAVIES, W. K. D. and D. M. HEALEY, 1977. "Consistency and Change in the Ecological Patterns of Calgary 1961-71", in B. M. Barr (ed.), *Research Studies by Western Canadian Geographers: The Edmonton Papers*, Vancouver: Tantalus Press, pp. 99-119.

DAVIES, W. K. D. and S. L. WELLING, 1977. "The Socio-Economic Differentiation of Alberta Towns in 1971", in B. M. Barr (ed.), *Research Studies by Western Canadian Geographers: The Edmonton Papers*, Vancouver: Tantalus Press, pp. 77-97.

DAVY, KELLEHER and McCARTHY, 1985. *Dublin in the Year 2000*, Dublin: Chamber of Commerce.

EASTERN REGIONAL DEVELOPMENT ORGANISATION, 1985. *Eastern Region Settlement Strategy 2011*, Dublin: ERDO.

HOUGHTON, D. S., 1975. "City Size and Social Differentiation — an Australian Comparison", *Tijdschrift voor Economische en Sociale Geografie*, Vol. 66, Nr. 4, pp. 217-224.

HOURIHAN, K., 1978. "Social Areas in Dublin", *The Economic and Social Review*, Vol. 9, pp. 301-318.

HOURIHAN, K., 1983. "Population Redistribution in Irish Cities: Dublin, Cork and Limerick, 1971-81", *Irish Geography*, Vol. 16, pp. 113-120.

JOHNSTON, R. J., 1971. "Some Limitations of Factorial Ecologies and Social Areas Analysis", *Economic Geography*, Vol. 47, No. 2, pp. 314-323.

KNOX, P. L., 1978. "The Intra-urban Ecology of Primary Medical Care: Patterns of Accessibility and their Policy Implications," *Environment and Planning A*, Vol. 10, pp. 415-435.

LO, C. P., 1975. "Changes in the Ecological Structure of Hong Kong 1961-71: A Comparative Analysis", *Environment and Planning A*, Vol. 7, pp. 941-963.

MURDIE, R. A., 1969. *Factorial Ecology of Metropolitan Toronto, 1951-61*, Research Paper 116. Department of Geography, Chicago: University of Chicago Press.

O'NEILL, M., 1976. *A Comparative Factorial Ecology of Three Irish Cities*, Unpublished thesis, Department of Geography, University College Dublin.

REES, P. H., 1971. "Factorial Ecology: An Extended Definition, Survey and Critique", *Economic Geography*, Vol. 47, No. 2.

RHIND, D. (ed.), 1983. *A Census User's Handbook*, London: Methuen.

SHEVKY, E. and W. BELL, 1955. *Social Area Analysis: Theory, Illustrative Applications and Computational Procedures*, Stanford: Stanford University Press.

SHEVKY, E. and M. WILLIAMS, 1949. *The Social Areas of Los Angeles: Analysis and Typology*, Los Angeles: University of California Press.

YEATES, M. and B. GARNER, 1976. *The North American City*, New York: Harper and Row.