

# Heterogeneity in a Small Nationwide Population: A Geodemographic Analysis

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## Abstract

The use of geodemographic analysis (the classification of areas based on the characteristics of their residents) has a long history, arguably stretching back to Charles Booth's Descriptive Map of London's Poverty, produced in 1886. However, it has not proved possible to identify projects which have focused on a single religion or ethnic group, rather than the population as a whole. The work described in this poster is believed to be the first to use geodemographic analysis to investigate a single minority group within a national census.

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## So what is 'Geodemographics'?

Geodemographics is the 'analysis of people by where they live' (Sleight, 1997, p16). Geodemographics extends the power of 'cluster analysis' by adding a spatial dimension. Cluster analysis takes a dataset of  $N$  entities or cases, about which values or information for  $k$  different characteristics or variables is known, and seeks to split the cases into groups or clusters which have broadly similar characteristics. Population data are most frequently clustered using either Ward's method, or the k-means algorithm.

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## Previous Census Geodemographic Assessments

Analyses based on UK census data (usually in combination with other data) have been carried out by commercial organisations to target marketing campaigns for private-sector organisations for over 30 years. Non-commercial analyses have been carried out for, or in partnership with, the Office for National Statistics from the 1981 census onwards. However, these analyses have considered the whole population. The work presented in this poster is believed to be the first application of geodemographic analysis to a sub-population.

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## What this Project sets out to do

This study has reviewed clustering techniques and previous census analyses to produce a novel methodology. This seeks to capitalise on the positive aspects of competing clustering techniques (and avoid their known weaknesses), to devise a methodology for examining a small, unevenly distributed population, and apply it to classify the Jewish population of England and Wales based on 2011 census data.

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## An overview of Anglo-Jewry

The most recent census measured the Jewish population of England and Wales as 265,000. Census analysis reveals that of the religion-based or ethnic minority groups, Jews are the least evenly distributed (see small map). Studies have identified that there are particular localities where 'strictly orthodox' Jews (many of whom dress distinctively) live, and have examined their socio-economic status. Most studies have implied homogeneity among 'mainstream' Jews.

- 7 Class Solution**
- A: Footloose cosmopolitan professionals
  - B: Blue-collar and student urbanites
  - C: Very young deprived traditionalists
  - D: Young fairly comfortable conservatives
  - E: Comfortable educated suburbanites
  - F: Affluent home-grown commuters
  - G: Comfortable home-grown elders

Areas where Jews make up:

- 0.25%
- 1%
- 3%
- 15%

of the population

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## Characteristics or Variables

A number of characteristics of Jewish residents have been extracted from census output, and reduced down to produce 17 variables to be used in the analysis, covering a range of issues, but with limited inter-correlation. A selection of the variables used are -

- Demographic: fertility; migration; 0-15 year olds; 65+ years; UK born
- Areas of work: retail; technical; education
- Socio-economic: house-owner; car owner; room overcrowding
- Household structure: Single person; married family

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## Geographic Units

Census output building blocks are Output Areas (OAs). These are grouped into MSOAs (average population 7800, average Jewish population 37). Contiguous groups of MSOAs (each with at least 18 Jewish residents) have been linked, to form 'analysis groups' with, on average, just under 600 Jewish residents. In total, 407 bespoke analysis units, including 90% of the Anglo-Jewish population, have been formed.

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G: Comfortable home-grown elders

E: Comfortable educated suburbanites

B: Blue-collar and student urbanites

D: Young fairly comfortable conservatives

A: Footloose cosmopolitan professionals

C: Very young deprived traditionalists

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## Applying the Methodology

The study hybrid methodology has been applied to the 407 case / 17 variables problem, to produce a 7-class classification of Anglo-Jewry in a manner which avoids the following pitfalls of individual techniques – local minima rather than global optimised solutions; outliers distorting the cluster formation; and cases not allocated to their closest cluster centre.

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## Results

The main map and North London inset show the results of the geodemographic analysis. The seven classes have been given labels which seek to concisely describe the main distinguishing features of the class. As the map demonstrates, there is a wide range in characteristics, but much spatial clustering of areas of the same type.

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## Conclusions

- 1 A geodemographic assessment of a sub-population is possible, even for a grouping which makes up only 0.5% of the national population and is very unevenly spatially distributed.
- 2 There is considerable heterogeneity amongst 'mainstream' Jews. Geographically, there is a clear division between inner urban Jews and suburban/commuter-belt/coastal Jews.
- 3 The work could form an essential foundation to a more extensive geo-social or demographic assessment/projection of Anglo-Jewry, and it could be applied to other minority groups.

## Acknowledgments

All census data and mapping used on this poster are Crown Copyright and reproduced or adapted from data from ONS (the Office for National Statistics) licensed under the Open Government Licence v.2.0, and all census tables used can be accessed via [http://www.nomisweb.co.uk/census/2011/data\\_finder](http://www.nomisweb.co.uk/census/2011/data_finder). The definition of geodemographics is from: Sleight P. (1997). Targeting customers : how to use geodemographic and lifestyle data in your business: 2nd edition; Henley-on-Thames : NTC Publications