Mapping interview transcript records: theoretical, technical and cartographic challenges

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Summary: This presentation presents an initial overview of a Qualitative GIS project being developed by WISERD involving experts in GIS and spatial analysis collaborating with qualitative researchers, some of whom come from disciplinary backgrounds not associated with spatial literacy. The presentation will describe and give examples of the process of geo-tagging interview transcript records created as part of the qualitative GIS research programme and the issues that emerged in working with qualitative researchers with respect to disclosive mapping, the generation of spatial metrics and the interpretation of spatial patterns and metrics with respect to the context of the qualitative interviews.

KEYWORDS: Qualitative GIS, Interview transcripts, geo-tagging, disclosive mapping, centrographic methods

1. Introduction

The Wales Institute for Social and Economic Research Data and Methods (WISERD) is an interdisciplinary, cross-institutional academic research group based in Wales, UK. One of the aims of WISERD is to draw upon collaborative inter-institutional working and wide-ranging expertise to develop and promote innovative mixed methods in social science research in Wales. To this end WISERD has been developing a Qualitative GIS strand and this paper summarises part of this emerging area of research. It has involved researchers with expertise in GIS and spatial analysis working closely with qualitative researchers to explore and develop methods and techniques in GIS that can be used in a mixed method approach to research (e.g. Ellwood and Cope, 2009). It has required careful negotiation for access to interview transcript records, methodological issues associated with geo-tagging the records, debates about the issues of confidentiality and disclosure, and particularly with respect to mapping outputs, and discussions concerned with the interpretation of spatial patterns and spatial metrics generated by the GIS in the context of the interviews. This presentation will focus on the latter issues of mapping, disclosure and the use of spatial metrics.

2. The interview transcript records

WISERD has developed a programme of research around three localities in Wales – the Heads of Valleys region north of Cardiff (known as the Cardiff locality); the Central and West Coast region (comprising the local authorities of Ceredigion and Pembrokeshire and the former district of Montgomeryshire in Powys and known as the Aberystwyth locality); and the A55 corridor from Wrexham to Holyhead in North Wales (known as the Bangor locality). Part of the research involved interviewing 120 stakeholders across the three localities who have links to one of eight policy areas (listed in Table 1) identified by the Welsh Government and WISERD. These reflect the range of key devolved and non-devolved policy areas and also map onto existing networks and centres of excellence of academic research in Wales.

Table 1. The eight policy areas covered by the interviews

Policy Area	
Crime, public space and policing	Education and young people
Language, citizenship and identity	Environment, tourism and leisure
Health, wellbeing and social care	Economic development and regeneration
Housing and transport	Employment and training

These interviews were transcribed and analysed by the qualitative researchers using a Computer Assisted Qualitative Data Analysis Software (CAQDAS) package, in this case Atlas.ti. This included identifying place names in the transcripts which were subsequently extracted, geo-referenced to a single point using the OS 1:50,000 scale gazetteer and imported into ArcGIS (see Southall et al (2011) for more on the use of gazetteers).

3. Mapping the interview transcripts

Geo-visualization is an important aspect of Qualitative GIS and a function that has been used to justify and promote its use (Knigge & Cope, 2009). Various cartographic methods have been considered in mapping the interview transcript records and three are presented here. The first is conventional dot mapping using proportional sized circles for each place mentioned in the transcripts. An example is shown in Figure 1. There is obviously a strong spatial association between the places mentioned and the localities in which the stakeholders were interviewed but stakeholders in the Cardiff locality seem to talk about more places across Wales than those in Bangor or Aberystwyth. There is also strong linear patterning to the places mentioned in the Cardiff locality, which partly reflect the distribution of settlements in the Welsh valleys but may also be indicative of the links and flows between the Heads of Valleys and Cardiff – something which the localities researchers are interested in investigating further.

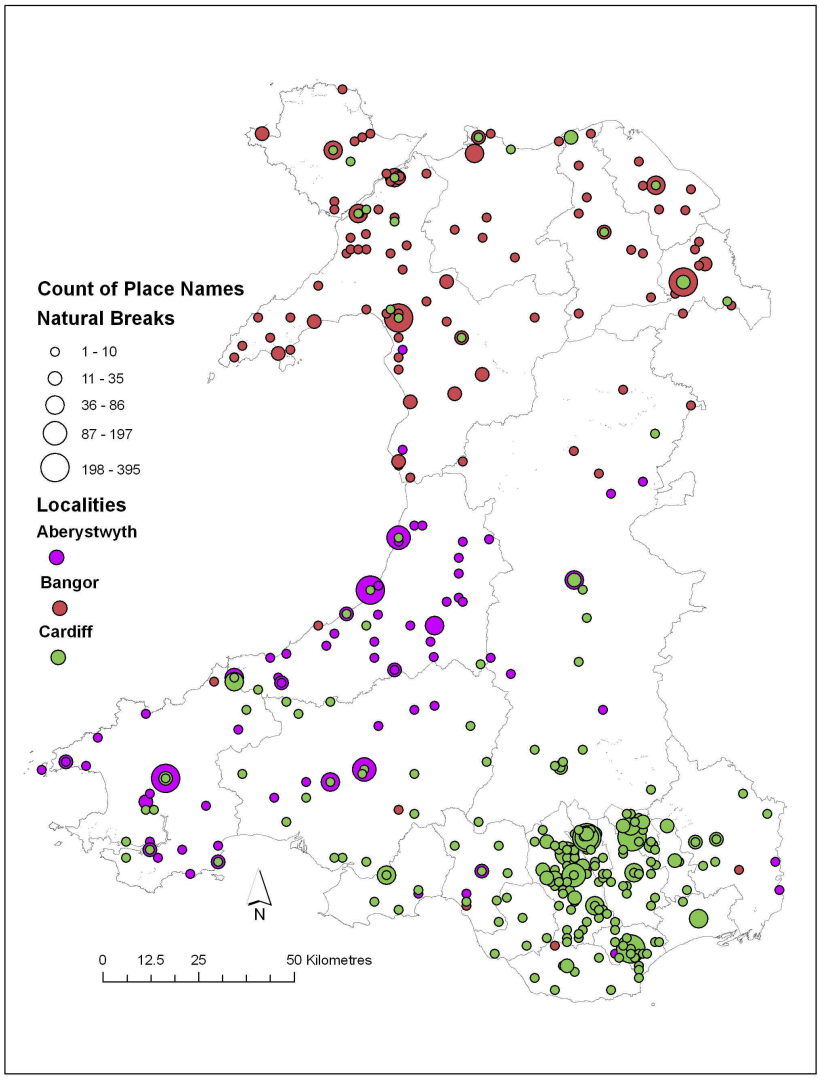

Figure 1. The frequency of places mentioned in all the transcripts by locality of interview

Figure 2 is an example of a kernel density surface of the places mentioned in the transcripts of all the stakeholders from the local authority of Ceredigion. Understandably, the term 'Ceredigion' was by far the most frequently mentioned place. As this refers to a wide area, rather than a localised place represented by a point, and also had a disproportionate influence on the density estimation, the geo-tagged record was removed. The density surface has the advantage of not disclosing the actual locations of the places although some places are identifiable such as Aberystwyth in the centre of the map and Cardiff in the south east corner. It also reveals the importance of the M4 corridor in the south of the map and the fact that few places are mentioned north of the locality.

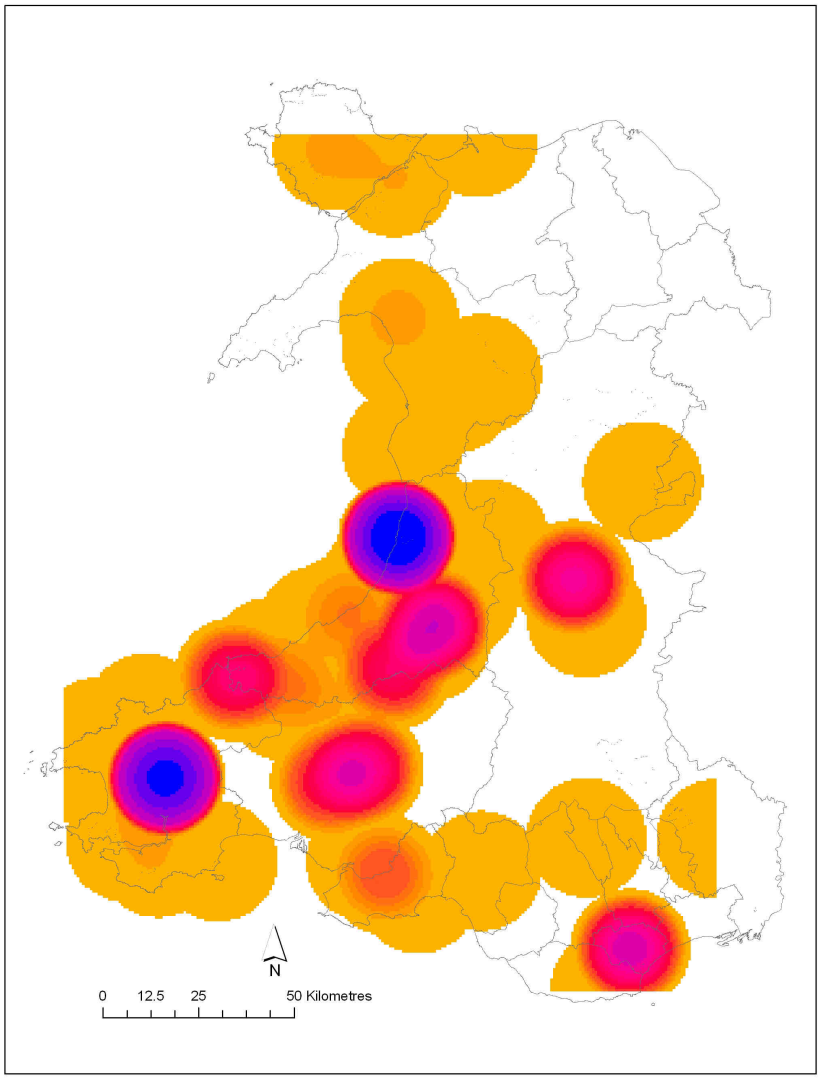

Figure 2. Kernel density surface of places mentioned in the transcripts of all the stakeholders based in Ceredigion

Rather than use dot maps and density surfaces, more appropriate methods of mapping potentially disclosive transcript records is to use methods based on centrographic techniques. Here the point locations are replaced by statistical summaries of the locations such as standard deviational ellipses and mean centres. An illustration of this is in Figure 3 of places mentioned in the Ceredigion transcripts categorised by the policy area of the stakeholder. A one standard deviational ellipse represents approximately 68% of the points and is centred on the mean centre of the point pattern, with its long axis in the direction of the maximum dispersion and its short axis in the direction of the minimum dispersion. Hence an ellipse is produced if the points have a directional component else the ellipse will be more or less circular. The map reveals the different geographies of the places mentioned in the transcripts by policy areas.

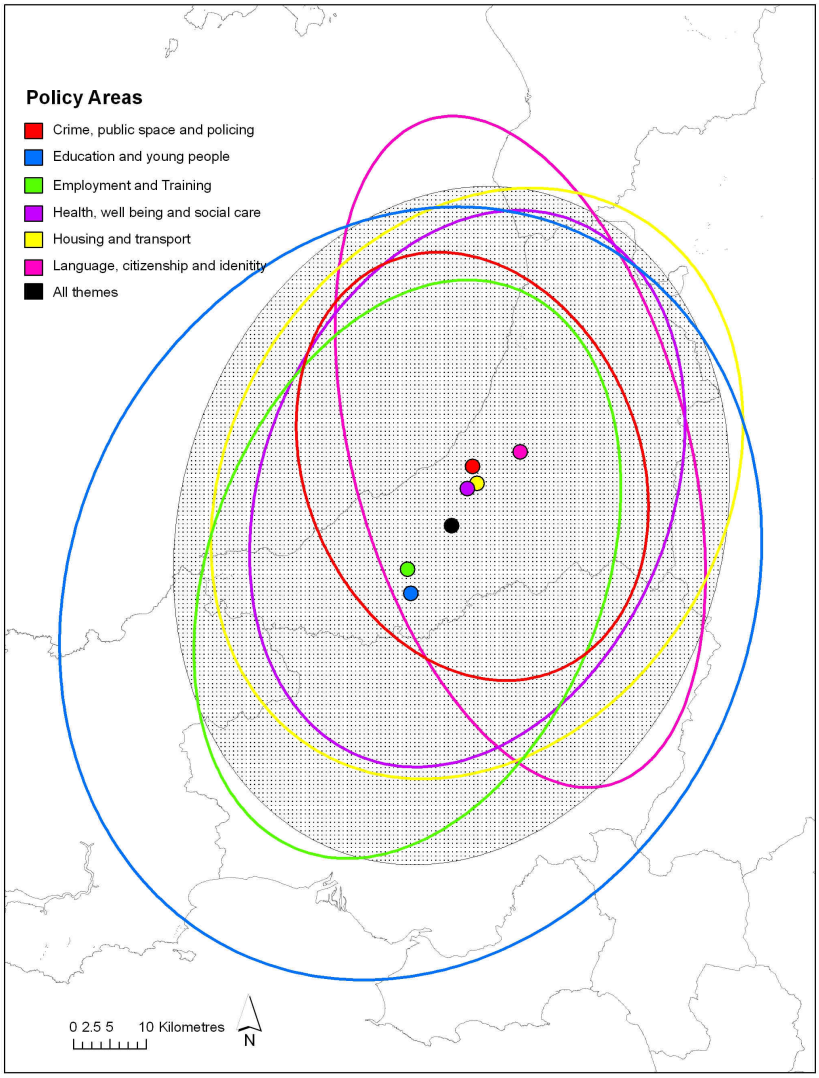

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Figure 3. One standard deviational ellipses and mean centres of place names mentioned in the transcripts by stakeholders in Ceredigion by policy area.

Table 2 summarises the sizes of the ellipses. The largest relates to 'Education and Young People' and is almost one and a half times the size of the all policy area ellipses and takes in most of the locality as well as parts of South Wales. The smallest is 'Crime, Public Space and Policing' and, together with 'Language, Citizenship and Identity', also has a distinctive orientation compared to the ellipses of the other policy areas. Three of the ellipses are of similar sizes but don't overlap. The qualitative researchers were particularly interested in these spatial descriptions of policy areas and they were used to inform a deeper interpretation of the interview transcripts.

Table 2. Area of one standard deviational ellipses by policy area

Policy Area	Area km-sq	% All Policy Areas
Education and young people	7981	144
Housing and transport	4566	82
Employment and training	3516	63
Health, well being and social care	3495	63
Language, citizenship and identity	3433	62
Crime, public space and policing	2196	40
All Policy Areas	5550	100

4. Constructing basic spatial metrics

It is fairly straightforward to generate spatial metrics and these can give further insight into the geographical relationships between places mentioned in the interview transcripts, the local authority of the stakeholder and their policy area. Table 3 reports a summary of the percentage of places mentioned in each Local Authority according to the local authority of the stakeholder interviewee. Naturally, the majority of places are located in the local authority associated with the stakeholder although there are some interesting variations. Interviewees in Blaenau Gwent, Gwynedd and Rhondda Cynon Taff mentioned places located in their own local authority around two-thirds of a time compared to nearly three-quarters for interviewees in Merthyr Tydfil, Pembrokeshire and Wrexham. Places outside of the Local Authority tended to be in neighbouring authorities.

Since the size of local authorities vary substantially, Table 4 reports summaries of Euclidean distance measures from the centre of each Local Authority to each place mentioned in the transcripts. This shows that interviewees in local authorities in the same locality tend to mention places within similar average distances, with those in the Cardiff locality talking about places relatively close to the centre of their local authority and those in Aberystwyth almost twice as far away again. Average distances in the Bangor locality are quite different for those interviewees in Wrexham and those in Gwynedd. All these distances are a function of settlement density to some extent (with rural Local Authorities have larger average distances), but comparison to Table 3 also suggests that there is more cross Local Authority border discussion of places in the Heads of Valley (Cardiff) locality than in the Bangor or Aberystwyth localities, once distance is taken into account.

Table 3. Percentage of places mentioned in each Local Authority according to the local authority of the stakeholder interviewee

	The Local Authority of the stakeholder interviewee						
Welsh Local	**Blaenau**	**Ceredigion**	**Gwynedd**	**Merthyr**	**Pembrokeshire**	**Rhondda**	**Wrexham**
Blaenau Gwent	**62.6**			3.9		1.6	
Bridgend				0.3	0.2	0.6	
Caerphilly	6.3			1.7		2.6	
Cardiff	4.9	3.7	3.6	4.3	3.8	12.1	2.2
Carmarthenshire	0.7	7.1	0.3	0.7	6.4	0.9	
Ceredigion	0.5	**66.3**	1.2	1.5	8.7	3.2	
Conwy	0.1	0.1	5.9		1.7		2.8
Denbighshire	2.8		4.1	0.2			5.3
Flintshire			2.4				8.7
Gwynedd		2.4	**63.8**	0.3	0.2	0.3	4.0
Isle of Anglesey		0.9	11.9		0.5	0.1	1.6
Merthyr Tydfil	2.7	0.6		**71.2**		7.9	
Monmouthshire	5.7	0.1	0.1	0.2		0.7	0.3
Neath Port Talbot	1.9	0.6	0.1	0.9	0.7	0.7	
Newport			0.1	2.4	0.5	2.6	0.3
Pembrokeshire	2.4	12.6	0.5	0.5	**75.4**	0.8	
Powys	0.7	3.7	1.5	1.4	0.7	0.6	0.3
Rhondda Cynon Taff	3.7			7.5		**60.2**	
Swansea	1.1	1.7	0.2	0.9	1.2	2.1	0.3
The Vale of Glamorgan	0.9	0.1	0.1	0.3		2.8	0.3
Torfaen	2.5			0.7		0.6	
Wrexham	0.5		4.3	1.0			**73.8**

Table 4. Average Euclidean distances from centre of Local Authority to places mentioned in transcript

Local Authority	Locality	Mean (km)	Standard Deviation	Count (places)
Merthyr Tydfil	C	11	24	584
Rhondda Cynon Taff	C	15	23	1044
Wrexham	B	16	35	321
Blaenau Gwent	C	17	36	751
Ceredigion	A	30	33	704
Pembrokeshire	A	34	39	423
Gwynedd	B	37	37	1002

To unpack the geography of the places that interviewees were discussing in more detail, descriptive summaries were calculated for each policy area in each locality. Table 5 reports the summaries for policy areas in Ceredigion. This demonstrates the large differences in the geographies of where interviewees were talking about and compliments the centrographic summaries in Figure 3. Interviewees in the policy area of 'Crime, Public Space and Policing' tend to discuss very few places and these tend to be very local to Ceredigion. Most interviewees talked about places around 25 miles from the centre of the Local Authority with the exception of interviewees in the policy area of 'Education and Young People' who were discussing places which were, on average, almost twice as far away.

Table 5. Average Euclidean distances from centre of Ceredigion Local Authority to places mentioned in transcript by Policy Area

Policy Area	Mean (km)	Standard Deviation	Count
Crime, public space and policing	15	23	69
Language, citizenship and identity	21	32	121
Health, wellbeing and social care	23	27	68
Housing and transport	27	29	116
Employment and training	28	29	83
Education and young people	42	37	247
All Policy Areas	**30**	**33**	**704**

5. Conclusions

This is an initial overview of a Qualitative GIS research project involving both experts in GIS and qualitative researchers from backgrounds with little association with spatial literacy or mapping. The collaboration between the researchers has highlighted different disciplinary approaches to encoding, managing, analysing and presenting spatial data and the team have had to negotiate issues such as data sharing, confidentiality, disclosure and what can and cannot be presented to people outside of the

team. It has also added value to conventional qualitative analysis – the qualitative researchers were genuinely fascinated by the maps and realised their potential to inform the analysis and interpretations of the transcripts. They also saw the value of the spatial metrics as measures that could not be created in the CAQDAS package they were using but which provided additional empirical evidence to some of the patterns that they had uncovered in the transcripts but could only be treated discursively in their qualitative analysis. Further researcher is being undertaken to develop cartographic techniques to create maps that present information that does not necessarily disclose the actual places mentioned in the transcripts. We are also investigating how other information encoded in the transcripts could be linked to the GIS and mapped and analysed in ways that will be meaningful and enhance existing qualitative analysis.

6. Acknowledgements

This paper is based on research supported by the Wales Institute of Social and Economic Research, Data and Methods (WISERD), funded by the Economic and Social Research Council (ESRC) (Grant Reference: RES-576-25-0021) and the Higher Education Funding Council for Wales (HEFCW).

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8. Biography

Dr Scott Orford is a senior lecturer in spatial analysis and GIS in the School of City and Regional Planning, Cardiff University, and the co-ordinator of the WISERD Data Team. His research interests include the analysis and modelling of socio-economic process, innovation in data integration and data construction and the mapping and spatial analysis of qualitative data.

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