LOCAL GOVERNANCE AND THE ONLINE NETWORKED PUBLIC SPHERE – A CASE STUDY

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Abstract

What are the prospects for the Web enhancing the local governance process by providing a networked public sphere? This paper addresses this question by researching online local civic activity associated with a case study of a UK local government referendum. Drawing upon Social Network Analysis theory, this research first of all applies Relational Hyperlink Analysis to map and structurally analyse the hyperlinked network. Secondly, it draws upon a Network Ethnography approach to identify and then interview key actors associated with this network. The results suggest a need for policy intervention to counter the distinct homophily effects and “politics as usual” scenario uncovered in the local online network.

Key words: hyperlink analysis, networked public sphere, social network analysis, exponential random graph modelling,
has generally either focused on its potential to promote a more deliberative democracy (see for example: Bimber 1998; or Dahlberg, 2001, 2007) or, of specific interest here, on how the structure of the Web can enhance democracy by delivering a more networked public sphere (Keane 1995, Sunstein 2001, 2007, Sparks 2001, Benkler 2006, Bruns 2008, Hindman 2009, Etling et al 2010, Hermida, 2010). Coleman and Blumler (2008) have attempted to straddle both aspects of this discussion by suggesting that the democratic potential of a Web enabled public sphere can be realised within contemporary notions of networked governance. Whilst this study will not concern itself with the deliberative democracy debate it is interested in the notion of the Web structurally enabling a public sphere within the context of local governance. As such, this paper will contribute to this scholarship by providing empirical evidence on the prospects of the Web enhancing local democracy through facilitating a networked public sphere.

The political attraction of the online networked public sphere is derived from the Web’s potential to provide a contemporary version of Habermas’s (1989) historical model. This model envisages the democratic restructuring of capitalist society and rests upon the presumption of a public realm existing independently from the state or market where informed interaction, discursive or otherwise, may occur between private individuals on political affairs of the day with the aim of influencing government policy. A number of commentators, (Sparks, 2001; Dahlgren 2005; Coleman and Blumler, 2009), have argued that the Web may provide such a new public sphere whilst Benkler (2006) has presented evidence that it provides a more democratic version of the public sphere offered by the traditional mass media. In either account it is the particular structure of the Web, its hyperlinked network, which can potentially provide citizens with universal, or greater, access to a range of political information, discussion and different points of view unmediated by vested economic and political interests. In this way the Web may provide a networked sphere of political influence which not only furnishes the citizen with considered political opinion but enables that opinion to command the attention of those in positions of power. Others offer a more sober account of the Web’s role in democratic renewal. Sunstein (2001, 2007), for example, has argued that the Web’s use can lead to a more fragmented public sphere while, more recently, Hindman (2009) provides evidence that the Web’s hyperlinked structure in and of itself is unlikely to deliver a networked public sphere within which the ordinary citizen’s voice is likely to be heard over that of traditional elites.

None of these accounts subscribe to a technological deterministic view of the Web and argue for policy intervention to develop its democratic potential. Coleman and Blumler (2009), echoing Calhoun’s (1993) requirement that a successful public sphere required a favourable organisation of civic society, argue that the “...potential is vulnerable...mainly because an infrastructure for its proper realisation is lacking” (p 11). They also insist that such an infrastructure should be structurally linked to institutions of government. This is again consistent with Calhoun (1993) who argued that the mere existence of a public sphere is no guarantee of democracy: a successful public sphere had to have an orientation towards the state. Sparks (2001) went further and maintained that while the Web made all kinds of political information and debate accessible an online public sphere that successfully engaged in the democratic process had to have a structural connection with the formal institutionalised decision making process. As such Coleman and Blumler, following Dahlgren (2005), see their concept of an online public sphere sitting within contemporary notions of networked governance. They argue “in thinking of the public sphere as a constellation of intersecting networks, rather than a space occupied by an ontologically homogenous collectivity, we are seeking to adapt the civic commons to the co-productive logic of contemporary governance” (p 180).

The development of a networked public sphere within such a context remains under-researched and this is particularly true at the level of local governance. This has policy
resonance within the UK where contemporary governance attempts at democratic renewal have been supported by Government policy and expenditure on local e-government and e-democracy initiatives, (Local National e-Democracy Project, 2004; Wright, 2006; Pratchet, 2006), and a continuing policy emphasis on “localism” (Queen’s Speech, 2010). Alongside these institutional initiatives there have been developments, driven by the popularity of Web 2.0 applications (Hermida, 2010) in the ability of private individuals to create their own networks. The research presented here is located in this context and inquires if the Web can enable a networked public sphere that may enhance local democracy by improving communication between local government institutions and the wider civic society. The research pursues this question through a case study of online political activity associated with a UK local government referendum and employs a mixed method approach to investigating the question. It, firstly, analyses the structural capacity of the Web to provide a networked public sphere in this particular local context and, secondly, it interrogates social actors involved with this online network with a view to presenting policy implications associated with using this online space as a new networked public sphere.

LOCAL REFERENDUM ON “BRITAIN’S BIGGEST CONGESTION CHARGING ZONE”

The Greater Manchester Transport Innovation Fund (TIF) proposal (Greater Manchester Passenger Transport Executive, 2008) - or the Manchester Congestion Charge scheme as it came to be more popularly known - was put to a referendum of 1.9 million registered voters in December 11 2008 (Manchester City Council, 2008a). The decision to hold a referendum on the scheme was taken in July 2008 by the Association of Greater Manchester Authorities (AGMA) the governance body through which the 10 local government authorities co-operate to co-ordinate a sub-region-wide approach to many issues including local transport (AGMA, 2008). This decision followed a year of intense, often acrimonious political lobbying, both for and against the proposal, by elected politicians – both local and national, the business community and activists from across the political spectrum ranging from environmental groups to car drivers associations. It was, as one interviewee, a local media commentator put it, “..the most important issue or story that has effected this area in a long while ..almost everybody had an opinion”.

Most contentiously the proposal aimed to implement the largest congestion charging scheme in Britain (Sturke, 2008). It would cover 80 square miles and consist of two cordons; the outer ring roughly cordonning the conurbation comprising the Greater Manchester Urban area; and, an inner ring around the Manchester City centre area (Manchester City Council, 2008b). It was this aspect of the TIF proposal which was to divide opinion amongst businesses, politicians and residents alike.

The scheme was perceived as both threat and opportunity to the economic interests of different sections of the business community. Crudely speaking those businesses who came out against the proposal had interests in freight haulage and retail parks located on the edge of the urban area and included substantial multi-national businesses such as Kellogg’s and Unilever alongside major local companies such as Peel Holdings, owners of the Trafford Centre one of the largest shopping centres in the UK. The business interests of those supporting the proposal were generally located within the city centre area and whilst numerous where generally not in the same financial league as those businesses opposing the proposal. Both sets of businesses interests formed lobby groups: the Greater Manchester Momentum Group (GMMG) opposed the proposal; and United City supported it.

There was also much at stake for local political interests and the governance of the sub-region. If successful the TIF proposal, as well as ushering in a congestion charging scheme, also provided considerable inward financial investment (£3bn) to
improve the transport infrastructure of all 10 local authority areas and generating, so it was claimed, 10,000 new jobs. This investment was much needed given that this was an infrastructure which was widely seen to be inadequate for both public need and the continued economic growth of the sub-region. Balanced against this were concerns over the economic impact of a congestion charge scheme on individual commuters. This was used to some effect by those campaigning against the charge who claimed that motorists commuting daily could be faced with charges of £1200 per annum.

This issue brings to bear a complex array of vested interests held by the civic and political actors who would contest the TIF proposal. Given these complexities and diverse and divergent views could the Web provide a local networked public sphere capable of enhancing communication between local government institutions and the wider civic society? The following describes the mixed method approach designed to address this question.

A MIXED METHOD APPROACH

Using hyperlinks to map online networks is now theoretically grounded as a web epistemology (Rogers, 2004) and practically established as a research technique (Rogers and Marre 2000; Ackland and Gibson 2004) for collecting online evidence that could represent "...a semblance of socio-epistemic network between organisations" (Rogers and Marre, 2000, p 145). Park et al (2005) and Ackland and Gibson (2007) have identified a series of functions that hyperlinks may perform, such as: information provision; network building; identity building; audience sharing; and, message amplification. Such different interpretations of the function of hyperlinks have varied according to the methodological perspective of the researcher (Park and Thelwall, 2003). This, according to Thelwall (2006), means that applying a single theory of hyperlink analysis has real limitations and recommends a research design that embodies some form of methodology triangulation. Accordingly this study applies the innovative technique of Relational Hyperlink Analysis along with a complementary network ethnography approach to analyse the potential, in this instance, for the Web to deliver a local, networked public sphere.

Relational Hyperlink Analysis

Relational Hyperlink Analysis (RHA) is derived from Social Network Analysis (SNA). This is a sociological technique which focuses on a set of social actors and the relations between them and is an approach for the analysis of social structures that are formally represented as social networks. In particular it can enable an understanding of how the structure of a social network can affect individuals and their relationships. In other words it can help to illuminate the affects of social agency and social structure upon social action (Crossley, 2010).

It was Park (2003) who first described websites as social actors and hyperlinks as the social ties linking them. He argued that the pattern of hyperlinks reflected the communicative choice of the website owners and therefore the structural pattern of hyperlinks served a particular social function. He maintained that through a hyperlink, an individual website plays the role of an actor who could influence other website’s trust, prestige, authority or credibility …Hyperlinks as connections represent networks among people, organizations, or nation-states. Thus, we can interpret the social or communication structure among those social actors based on the hyperlink structure. (Park, 2003, p 53).

As such the application of SNA to hyperlink data can enable an interpretation of the hyperlinked network as a social structure. Lusher and Ackland (2009) advanced Park’s idea of “hyperlink network analysis” by applying a set of statistical models associated
with SNA, Exponential Random Graph Models (ERGM) to hyperlinked networks. They termed this technique “relational hyperlink analysis” arguing that it is “…a relational social science framework, which pays particular attention to hyperlinks as social connections, not merely indicators of popularity or visibility” (p 3).

The particular facility of this approach lies in the ability of ERGMs to control for structural effects in a network enabling the researcher to distinguish, in all probability, between hyperlinks that may have been made as a consequence of particular characteristics in the network structure and those that may have been made as a consequence of the attributes of the individual actor.

A structural network effect is where relational ties, or in this case hyperlinks, are driven by social structural phenomena such as reciprocity or transitivity. An example of reciprocity as a social structural network effect driving social tie formation is where a stranger might extend their hand in greeting and, typically, this is reciprocated without any prior knowledge of the stranger’s qualities. Translated to the Web this might occur where a link is made from one website or page to another simply because they are returning the link as opposed to linking because they want to engage with the site’s content. Similarly, transitivity can be described as ‘the friend of my friend is my friend’, again a particular social structure drives a social tie that can be formed without prior knowledge of the actor’s, or website’s, particular qualities or attributes.

By contrast an actor attribute network effect is one where social ties, or hyperlinks, are made because of the actor’s attributes, or in this case, website content. A typical example of this effect is homophily which describes the tendency (McPherson, Smith-Lovin, & Cook, 2001) for like minded social actors to link to each other the social tendency aptly described in the old adage ‘birds of a feather stick together’. Online this social phenomenon can manifest itself in distinct hyperlinked clusters of websites sharing similar views.

This research approach is distinct from that of Benkler (2006) and Hindman (2009). In analysing their distribution of hyperlinks they made no account of the particular, social, process driving hyperlinking behaviour. As Lusher and Ackland have claimed the failure to take account of such social processes may lead to spurious conclusions that websites attract hyperlinks because of their content as opposed to the structural organisation of the network. To be clear, it is important to note that that this paper does not argue that traffic to a website will be directed differently if a link is driven by either the particular structure of the network or the content of the website. However, this study does argue that the ability to distinguish between what is driving hyperlinking behaviour should enable a greater understanding of why some sites should be more prominent than others in the network. Moreover, if links made as a consequence of structural network effects can be controlled for, then links driven by site attributes may be evaluated as evidence of a networked public sphere. Evidence of such purposeful linking behaviour may also usefully inform the semi-structured interviews that are part of the next stage of this research.

Network Ethnography

The second complementary phase of this investigation applies a more qualitative analysis to the online network and draws upon a network ethnography approach developed by Howard (2002) and enhanced by Biddix and Park (2008). This involves the “….process of using ethnographic field methods on cases and field sites selected using social network analysis” (Howard, p 561). For Howard this is not simply a marriage of two traditional methods but a distinct research method which provides some conceptual advances not least of which is “the researcher can dynamically use the initial ethnographic and social network analysis to improve subsequent enquiry….The social network analysis will identify key organisations, events and people worth discussing in
depth interviews” (p 561). For Biddix and Park the key strength of the network ethnography approach is its potential to minimise sample bias by incorporating network analysis to identify sub-groups or clusters worth further study. Significantly, they also used network maps, derived from their hyperlink analysis, as a discursive tool in their depth-interviews.

DATA

Following Lusher and Ackland (2008), the web-crawling software VOSON (Ackland, 2008) was used to map the Congestion Charge hyperlinked network. VOSON “crawls” the world-wide web following outward bound hyperlinks from a pre-determined set of web pages: a “seedset”, chosen by the researcher. VOSON then enables the data to be visualised through a number of different mapping concepts and a series of basic Social Network Analysis measures can be derived.

The primary purpose in selecting a “seedset” here was that it should provide a cross section of sites that were representative of civic actors engaged in the referendum campaign (table 1). Once the “seedset” was finalised, VOSON was set to crawl the internet and this paper analyses the network as it was captured at the close of the referendum. From the dataset that was harvested by this crawl a network was defined by including only those sites that explicitly referenced the TIF proposal or referendum were retained for further analysis. This is consistent with what Laumann et al (1983, 21) have called “a realist strategy of setting network boundaries by definition assumes the proposition that a social entity exists as a collectively shared subjective awareness of all, or at least most, of the actors who are members”. In other words this realist strategy assumes that there are common or shared attributes amongst members of the network.

The retained sites were categorised as follows: a Governance site (Gov), that is, they were a local government site or were an official site overseeing the TIF consultation and referendum; a Non-Government Organisation (NGO), these included sites that were established by civic activist to protest or support the TIF proposal; Political Party sites; Media (Press or TV) sites and those sites employing Web 2.0 technologies. The latter were categorised according to the definition provided by O'Reilly (2005).

Table 1 ‘Seedset’
To be clear, those sites not categorised as Web 2.0, but categorised as, for example, ‘Gov’ or ‘Media’ are to be understood as Web 1.0, broadcast, sites, in other words they do not facilitate any interactive engagement or exchange of information with the public but simply provide information for public consumption. The objective of categorising sites in this way was to measure, through this structural analysis, the extent to which the ‘bottom-up’ networks of private individuals might link with the more ‘top-down’ institutional networks. This linkage, as described by Hermida (2010), can be understood as a more contemporary measure of an online networked public sphere.

A decision was, taken following Kelly and Etling (2008), to analyse the core structure of the network. This was identified by selecting the most densely linked part of the network. Hence a subset of the wider network was selected that had a degree score of 4 or more, that is, only those sites were selected that were linked to by 4 or more ‘seedsites’, or they had reciprocated links with two ‘seedsites’. The hyperlinked network derived from this process and analysed here is taken from the close of the referendum and contains 58 websites.

To enable subjects to be framed for the qualitative network ethnography investigation a number of SNA measures were derived, from VOSON, for each of these sites. All the measures used are measures of node centrality thereby indicating the extent to which any given node is prominent in the network. As such the ‘betweenness’ measurement provides an indication of how often a website may lie on the shortest path between two other sites and can be used to gauge the potential for that site to act as a ‘gatekeeper’ in linking activity or flow of information in the network. The Hyperlinked-Induced Topic Search (HITS) algorithm, on the other hand, was developed specifically to analyse the network structure of a hyperlinked environment (Kleinberg, 1999). This
measurement of centrality indicates the extent to which ‘authority’ is conferred upon particular websites in the network.

A cross section of site categories that had a ranking in the top 20 on at least one of the SNA measures was then selected (see Table 2). The exception is the cleanairnow.co.uk site. This site was included as it was considered necessary to look at the environmentalist “voice” within the network domain and this gained the highest SNA scores of such sites. This necessity was driven by a desire to understand why or how, given that one motivation for the TIF proposal was protecting the environment through reducing car usage, the campaign on the referendum had been overwhelmingly dominated, both online and off, by an economic discourse.

Table 2. Selected sites with rankings on SNA measures of centrality.

<table>
<thead>
<tr>
<th>url_pagegroup</th>
<th>Site cat</th>
<th>'Hits_hub' ranking (n = 58)</th>
<th>'Hits_auth' ranking (n = 58)</th>
<th>'Betweeness' ranking (n = 58)</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.gmfuturetransport.co.uk/">http://www.gmfuturetransport.co.uk/</a></td>
<td>GOV</td>
<td>30</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td><a href="http://www.manchestertolltax.com/">http://www.manchestertolltax.com/</a></td>
<td>NGO</td>
<td>7</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td><a href="http://www.gmmgroup.co.uk/">http://www.gmmgroup.co.uk/</a></td>
<td>NGO</td>
<td>39</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td><a href="http://www.wevoteyes.co.uk/">http://www.wevoteyes.co.uk/</a></td>
<td>NGO</td>
<td>40</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td><a href="http://www.facebook.com/">http://www.facebook.com/</a></td>
<td>WEB 2</td>
<td>19</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td><a href="http://www.bbc.co.uk/">http://www.bbc.co.uk/</a></td>
<td>MEDIA</td>
<td>31</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td><a href="http://blogs.manchestereveningnews.co.uk/">http://blogs.manchestereveningnews.co.uk/</a></td>
<td>WEB 2</td>
<td>10</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td><a href="http://www.rochdale.gov.uk/">http://www.rochdale.gov.uk/</a></td>
<td>GOV</td>
<td>14</td>
<td>34</td>
<td>22</td>
</tr>
<tr>
<td><a href="http://www.cleanairnow.co.uk/">http://www.cleanairnow.co.uk/</a></td>
<td>NGO</td>
<td>37</td>
<td>31</td>
<td>53</td>
</tr>
<tr>
<td><a href="http://www.stockport.gov.uk/">http://www.stockport.gov.uk/</a></td>
<td>GOV</td>
<td>16</td>
<td>33</td>
<td>16</td>
</tr>
<tr>
<td><a href="http://www.trafford.gov.uk/">http://www.trafford.gov.uk/</a></td>
<td>GOV</td>
<td>13</td>
<td>32</td>
<td>15</td>
</tr>
</tbody>
</table>

As table 2 illustrates a total of 11 sites were chosen for further investigation. Further research was necessary to locate the right person associated with the chosen site to interview. This process uncovered a further 2 contacts who were recommended as useful informants.

Interestingly, whilst the mapped hyperlink network was useful in helping to identify prominent actors, it also usefully served to highlight notable absentees from the network. For example, significant by their absence from the online network was the dominant political party, both locally and nationally, the Labour Party. Given that this was also the party that had developed and promoted the TIF proposal their lack of prominence online was a curiosity that merited further investigation. This lack of Labour Party representation online was a question that was posed to the first round of interviewees. Whilst they were forthcoming on this issue they also suggested potential subjects for interview in the local Labour Party who had, in their opinion, campaigned either online or offline, for and against the TIF proposal. This resulted in a further 4 subjects being identified for interview. In total 17 subjects were selected for further investigation. Once located the preferred method of enquiry was a semi structured interview.

MAPPING THE ONLINE CONGESTION CHARGE NETWORK
The first stage in structurally exploring the online congestion charge network involves mapping the network. VOSON enables a number of SNA measures to be applied to the selected network and then rendered graphically in a network map. One such measure enables “authoritative” sites within the network to be identified. Such sites are gauged by the application of a (HITS) algorithm. This calculates “authoritative” sites as those sites that are most linked to by other “hub” sites on this particular issue in the network. This is a measure of node centrality, that is, a measure of the extent to which a given node is important or prominent in a network.

Figure 1 details these sites at the close of the referendum in Dec 2008. The size of the node in this map is proportionate to the measure used; the bigger the node the higher the score on the measure. It can be argued then according to this map that the 7 largest nodes comprise 3 “authoritative” Governance sites and 4 “authoritative” Non-Government sites. The most authoritative site on this measure is the Governance site, “gmfututertransport.co.uk”. This was the main Governance site that contained all the official information on the TIF proposals.

The working assumption here is that such sites are highly referenced because of their attributes or, in other words, the information contained on their sites. The other point to bear in mind is that none of these sites utilised any Web 2.0 technology, they were very much fashioned as Web 1.0, broadcast sites.
Figure 2 reveals the “hub” sites that point or link to the “authoritative” sites. What is of interest here is the range of sites that are acting as hub sites. There are prominent sites on this measure from all the different site attributes, including Web 2.0 sites, representing a range of divergent views on the congestion charge debate. Moreover, as Figure 1 demonstrates, they are linking to the main Governance site on this issue. Read together these two maps might point to individual’s private networks, “bottom-up” networks linking to the more institutional (governance) “top-down” networks (Hermida, 2010). They also indicate that the topography of this local online network might have “good enough” links (Benkler, 2006) to ensure ordinary citizens’ concerns on this issue achieve political salience. At the very least they suggest the existence of an online political sphere linking divergent views with the local governance process (Sparks, 2001).
However, explaining how these sites became prominent in this online network is important in understanding the potential, from an empirical and policy perspective, for an online local networked public sphere. Has such an online political sphere of influence occurred by chance – by the structural self-organisation of the network – or by the purposeful hyperlinking behaviour of the social actors involved in the network? Resolving this question may help to shape the policy intervention as envisaged by Coleman and Blumler (2010).
The second stage of the structural analysis of the network involves the application of an ERGM in an attempt to unlock the significance of the hyperlinks in the online network. The facility to control for structural self-organising properties of the network is an advantage of ERGMs that enables the researcher to distinguish, in all probability, between hyperlinks that may have been made as a consequence of particular characteristics in the network structure and those that may have been made as a consequence of the individual website attributes. However, the structural effects to be controlled for need to be specified by the researcher. As Robins et al (2007, p 176) state “in general, the structural characteristics in question help to shape the form of the model”. As such assumptions need to be made about the structural features that are likely to occur in the observed congestion charge network. The statistical model will then determine whether these features are more likely to occur in the observed network than might be expected by chance. For example, an assumption has been made that both reciprocity and transitivity are a feature of the congestion charge network. Accordingly, these have been selected, amongst others (see Table 3), for the model where the index of the level of reciprocity and transitivity is a parameter. PNet is the name of the software chosen to run the ERGM and further details on this can be seen below.

Table 3. Purely structural effects used in higher order PNet social selection models

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation</th>
<th>PNet parameter name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Density</td>
<td>One actor nominating another actor (baseline propensity to form ties)</td>
<td>Arc</td>
</tr>
<tr>
<td>2 Reciprocity</td>
<td>Mutual ties between two actors (models the tendency for reciprocation across the graph)</td>
<td>Reciprocity</td>
</tr>
<tr>
<td>3 Simple connectivity</td>
<td>Correlation of the in and outdegree, such that it models the propensity of senders of ties to also receive them</td>
<td>Mixed-2-star</td>
</tr>
<tr>
<td>4 Popularity</td>
<td>Indicative of the presence of highly nominated individuals within a network (models the indegree distribution)</td>
<td>K-in-star</td>
</tr>
<tr>
<td>5 Expansiveness</td>
<td>Indicative of the activity of actors to engage many others (models the outdegree distribution)</td>
<td>K-out-star</td>
</tr>
<tr>
<td>6 Clustering</td>
<td>Triadic clustering (i.e. a friend of a friend is a friend)</td>
<td>AKT-T</td>
</tr>
</tbody>
</table>

Similarly, parameters need to be specified to model how network links may be driven by the attributes of individual sites and these are detailed in table 4. These
parameters model the propensity of each site with a given attribute (Gov, NGO etc) to send links, receive links or choose other sites with the same attribute. This latter parameter aims to model the propensity for ‘birds of a feather to flock together’ or homophily effect. Each of these three parameters was applied to each of the five website categories or attributes (Gov, NGO, Political Party, Web 2.0 and Media) resulting in 15 individual site attributes to be modelled.

Table 4. Individual actor attributes

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Explanation</th>
<th>PNet parameter name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sender</td>
<td>The attribute of the sender of the tie, which may be continuous, categorical or binary (models the propensity of an actor with the attribute to send ties, i.e. to be active in network terms)</td>
<td>Rs</td>
</tr>
<tr>
<td>2 Receiver</td>
<td>The attribute of the receiver of the tie, which may be continuous, categorical or binary (models the propensity of an actor with the attribute to be popular)</td>
<td>Rr</td>
</tr>
<tr>
<td>3 Homophily</td>
<td>The propensity of a person with a binary attribute (e.g. “sex”) to choose other persons with the same attribute</td>
<td>Rb</td>
</tr>
</tbody>
</table>

The decision to use PNet for this analysis was influenced by Lusher and Ackland (2008) who used this software in their application of Relational Hyperlink Analysis. PNet (Wang, Pattison & Robins, 2006) is a program developed for the examination of social networks using the new specifications (Snijders et al., 2006) for ERGMs. PNet can be downloaded from [http://www.sna.unimelb.edu.au/pnet/pnet.html](http://www.sna.unimelb.edu.au/pnet/pnet.html). There are other software programs that run ERGMs. One example is SIENA (available from: [http://www.stats.ox.ac.uk/~snijders/siena/](http://www.stats.ox.ac.uk/~snijders/siena/))

Reading the ERG Model

This ERG model works to produce parameter estimates and associated standard errors which are used to establish confidence in the estimation. According to Lusher and Ackland (2008),

The parameter estimates of the configurations in an observed network are compared to those in a hypothesized distribution of networks of similar qualities, such as a similar number of nodes and a similar number of network ties. It is then possible to see if there are more or less configurations in the observed network than might be expected by chance. If there are some configurations occurring at greater
or less than chance levels, it can therefore be inferred that the observed network structures are not just coincidental observations but consistent patterns of social relations. (p 10).

Table 5 details the statistics and fitted estimation collated using PNet to model the online congestion charge network. To explore the question of structural and individual level effects the network was modelled accordingly as model A, with mainly individual level attributes, and, model B with both structural and individual level attributes.

To briefly explain Table 5. The column down the far left hand side details the chosen parameters to be measured and controlled for: the 6 structural parameters followed by the 3 actor attribute parameters modelled for each of 5 the node/site level categories (Gov, NGO, Political Party, Web 2.0 and Media) resulting in 15 separated actor attribute parameters in all. Model A is characterised by providing an estimate on all 15 individual actor attribute parameters with just one structural parameter. Model B provides measures for all parameters in the model. In other words, it introduces the remaining structural parameters into the model thus controlling for the purely structural self-organising tendencies of the network. Thus to understand how the individual actor attributes play out over and above the structural effects it is necessary to read how the parameter estimates change from Model A to Model B. The estimates of interest are those denoted with an asterix*. This indicates there is a 95% chance (the only standard error applied by PNet) that the statistic is significant, that is, it has not occurred by chance but is a real social effect. If such a parameter estimate displays a negative sign before it then this indicates that the effect happens at less than chance levels, given the other parameters in the network, in other words, such network ties are unlikely to be observed within the network. A positive and significant estimate means that such an effect exists at greater than chance levels, and is more than likely to be observed within the network. It is important to emphasise the interdependence of the ERG model and that individual parameter estimates have to be read in relation to other estimates in the model.

What does the model tell us then? In Model A, it can be seen that the modelled homophily effect – birds of a feather stick together- for “Gov” and “Web 2.0” sites are significant and positive. This indicates that these sites have a greater propensity to hyperlink with sites similar to themselves. Moreover, these statistics remain significant when the structural parameters are introduced in Model B suggesting that this effect is a consequence of the site attribute and is more than likely to occur as a consistent pattern of social relations in the congestion charge network. It can be seen that the more sophisticated structural effects introduced in “Model B” have resulted in reducing the parameter values for the “Gov” and “Web 2.0” sites, but not enough to override the contribution of the sites” attributes. The homophily effect is also significant but negative for NGO sites indicating that they are less likely to hyperlink with sites similar to themselves.

A similar story can be seen when the sender effect for “NGO”, “Political Party” and “Media” sites is modelled. Their parameter estimates, significant and positive at Model A, remain significant and positive even when the structural effects in Model B are introduced. This suggests that these sites have a propensity for sending links to other sites and this is a unique consequence of these sites” attributes. Moreover, if these sender effects are read in conjunction with the homophily effect then it can be read that it is only these sites in the network that are sending links to other sites with different attributes to their own.

When the receiver effect is modelled it is only the Web 2.0 sites, in Model B, that are statistically significant but negative indicating that this effect will occur at less than chance levels. If this is read in conjunction with the homophily effect then it can be seen
that Web 2.0 sites in the network are less likely to receive links from sites with different attributes.

Table 5. Summary of parameter estimates and standard error (p < 0.05) for online network at close of referendum**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Model A</th>
<th>Model B</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structural</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arc</td>
<td>-3.79 (1.37) *</td>
<td>-5.58 (1.10) *</td>
</tr>
<tr>
<td>Reciprocity</td>
<td>0.99 (0.29) *</td>
<td></td>
</tr>
<tr>
<td>Simple connectivity (Mixed 2 star)</td>
<td>0.01 (0.01)</td>
<td></td>
</tr>
<tr>
<td>Popularity (K-in-Star)</td>
<td>1.46 (0.21) *</td>
<td></td>
</tr>
<tr>
<td>Expansiveness (K-out-star)</td>
<td>-0.79 (0.34) *</td>
<td></td>
</tr>
<tr>
<td>Clustering (AKT-T)</td>
<td>0.52 (0.10) *</td>
<td></td>
</tr>
</tbody>
</table>

**Actor attributes**

**Interactive/ Homophily Rb**

Gov | 2.61 (0.38) * | 1.99 (0.34) * |
NGO | -0.49 (0.30) | -0.60 (0.29) * |

**Sender Rs**

Gov | 0.33 (0.91) | 0.55 (1.02) |
NGO | 2.25 (0.86) * | 2.38 (1.01) * |
Political Party | 0.86 (0.40) * | 1.07 (0.42) * |
Web 2.0 | 1.51 (0.85) | 1.97 (1.00) |
Media | 1.93 (0.88) * | 2.41 (1.02) * |

**Receiver Rr**

Gov | -0.29 (1.07) | -1.02 (0.67) |
NGO | 0.23 (1.09) | -0.51 (0.69) |
Political Party | -0.85 (0.94) | -0.76 (0.59) |
Web 2.0 | -1.76 (1.09) | -1.74 (0.70) * |
Media | -1.32 (1.09) | -1.24 (0.69) |

**The Goodness of fit for this model is not perfect. However, the vast majority of statistics did fit (100 out of 105) and this was the best fitting model for this data.**

The output from the ERG model appear to suggest that website producers during the congestion charge referendum were networking or interacting with other sites in different but meaningful ways. The producers of the Governance sites were mainly linking to other Governance sites and a similar pattern of social relations was being observed by the Web 2.0 site users who were, in the main, linking to other Web 2.0 sites. This was, according to the ERG model, a decision motivated by the attributes of the
site(s) and not a consequence of the particular structure of the network. In other words, this particular configuration in the online network is likely to have been formed by the purposeful hyperlinking behaviour of the social actors involved in the network. As such, from the Governance perspective it appears there was a conscious decision not to link to the Web 2.0 sites and not to encourage visitors to their sites to participate in the many discussion forums or view the videos hosted by the Web 2.0 sites in the network. This appears politically remiss given the economic significance of the TIF bid to the local economy and, in the opinion of one interviewee, the resulting overwhelming rejection of the TIF package in the referendum was "a real endorsement of the way in which the "No" campaigners used Web 2.0." Similarly it appears that the Web 2.0 users were mainly interested in directing their traffic to other Web 2.0 sites and not towards the official information on the proposed "congestion charge" scheme posted on the Governance sites.

What is also noteworthy here is that this is not apparent from the visualised hyperlink network maps and was only revealed through the application of Relational Hyperlink Analysis. The visualised network maps revealed links between local governance sites and sites with different attributes which may indeed have comprised "good enough" links to suggest an effective online networked public sphere evolved during this referendum. However, analysis of the ERGM suggests that these are likely to have been the exception with links mainly being driven by a desire to link to sites sharing similar attributes.

**Insight from the Network Ethnography approach**

Analysis of the social actors’ narratives collected by the network ethnography approach provides further insight into how this online network was used. They serve to explain the hyperlinking behaviour of local government in this case and why they were generally reluctant to engage with the many online discussion forums. As one local government official commented,

> it’s a new tool but ...the internet can be anonymous so in those {online} debates we were talking about do you have 200 people or 5 people under 20 different names? So it’s difficult to assess the importance of it or the audience you are reaching.

The problem associated with the anonymity or fluidity of identity of participants in online discussion forums was a recurring theme in a number of interviews with local government officials and elected representatives. Another recurring theme was the general incivility of the online discourse, as one locally elected representative argued

> We’ve not got the maturity or opportunity or what have you to hold a sensible event on the internet... and this is because it’s anonymous because people can send quite vicious messages to each other without consequences.

The problem for these local government actors is that the nature of this online discourse was so asynchronous with normative views of what constitutes civic engagement within a local democracy that it was hard for them to trust, or quantify any political or democratic value to this type of participation.

This perspective conflicted with the views of proponents of a more “democratic citizenship” (Coleman and Blumler, 2009) over what constitutes a legitimate enactment of local online citizenship. As a local community activist put it

> ………the interesting one for me is that the 5 people in a discussion forum have created a group which can carry on afterwards, what it’s doing, the internet and
Web 2.0 is doing, is it allows people to create relationships. I’ve heard this argument all the time from local authorities and I just think it’s naïve: “It’s only 5 people what does it mean?” Well it’s a collective voice and you’re just using different tools and techniques to hear the collective voice, it’s just bullshit ……..no they’re not representative of the whole of the community but it’s part of the process and more importantly they are trying to engage you in dialogue.

Trust, or lack of it, was also a motivating factor in the hyperlinking behaviour exhibited by those actors using the Web 2.0 sites for their campaigning purposes. One actor associated with the site “manchestertolltax.com” and participant in anti-congestion charge Facebook groups and online discussion forums explained why people on such sites were unlikely to link to the main governance site on this issue ‘gmfuturetransport.co.uk’. “The bottom line was that people felt that they couldn’t trust what was being said ………nobody believed it was a neutral site anyway …there was an awful lot of gerrymandered statistics”. This explanation was echoed by an actor connected to the pro-congestion charge ‘wevoteyes’ site who felt that ‘lack of trust in the political class’ was a factor that undermined the effectiveness of their campaign.

The narratives also helped to reveal why it was that the NGO and Media sites appear most significant in the network in the sense that their hyperlinking behaviour suggests that they were more likely to mediate online traffic. Interviews with actors connected with the three most prominent NGO sites revealed that dominant commercial interests in the city had financed their respective campaigns and online presence. In the case of the main anti-congestion charge group such resources had been directed to optimising their site, “gmmgroup.co.uk”, for search engines. This would be one explanation for the prominence of this site in the online network.

The online media presence here reflected the dominance of offline traditional media outlets with, in particular, sites associated with the BBC, and the local paper, the Manchester Evening News, effectively mediating the message in this local online network. Here the captured narratives underlined an understanding of, and approach to, online engagement which contrasted with the uncertainty and suspicion that characterised the local government approach. One journalist associated with these sites evinced a clear understanding of how hyperlinks could be effectively used:

I think it’s the way the internet works …..I have seen other websites who only link to their own content and I don’t think that’s right …….it’s an interconnected network of web links and that’s how I’d like people to use our site ….you don’t sit in judgement.

Another, who ran a blog during the referendum, commented on the efficacy of engaging with the new technology, “….it helped to combat scepticism of the media through increased transparency”. The following comment also highlights the risks that the Media were prepared to take,

….literally in new territory we did not know how people would respond… from July once we knew were heading towards the referendum we were looking for a way of trying to engage people of Greater Manchester in a big news story.

There are other distinct institutional characteristics of Media organisations and Local government that may help to explain their different approach to online engagement. What is interesting from the scope of these narratives is that they imply some transformative policy changes for local government if they wish to harness the ‘vulnerable potential’ of the internet in the service of democratically enhancing the local governance process.
The need for such transformation is underlined by narratives that revealed the importance of the online network evidence to individual activists involved in the referendum campaign. As one local activist prominent in the pro-congestion charge campaign noted

...was it a political space? Highly!...in the hurly burly of running this campaign which was incredibly heated and quite feisty the question of who was saying what online was a constant issue...

Of particular interest here was how the campaigning activists made political use of the evident online homophily described by the ERG modelling. This was illustrated by the activist associated with the manchestertolltax.com site. He described how they used their Facebook group, with over 17,000 members, to create an online ‘ripple effect’:

....we used the Facebook site ....we just dropped hand grenades in there ...anything that I found went straight onto the Facebook site. There was story in the Salford Advertiser that said if the [TIF] finances didn’t add up then there would be higher council taxes ...they denied it and denied but I eventually found it tucked away in a document and I put it in Facebook and away it went.....

It is instructive in commenting on the development of a networked public sphere that these activists used the evident balkanisation of online opinion to their advantage. They effectively ‘fed’ their online enclaves certain choice pieces of information which would then resonate with a large number of supporters. This appears to have had two effects, one the information became the accepted ‘truth’ or position of the wider campaign and, secondly, the quantity of support pushed this position back into the public sphere to challenge the official version of events. This is consistent with what Benkler (2006) revealed and Sunstein (2007) subsequently acknowledged, that homophily in and of itself is not necessarily an impediment to the development of an effective public sphere. As Benkler argued, the Web provides ‘good enough’ links to ensure the particular views from such homophilious groups achieve a political salience by reaching, in this case, the public authority of the day.

CONCLUSION

This study has presented a mixed method research approach to investigating the prospects for a local online networked public sphere. One method viewed hyperlinks as social connections within a defined social network and sought to uncover the social processes that were driving the hyperlink connections. This revealed that, in all probability, hyperlinks were being driven, in this instance, by website content and not the particular structural configuration of the network. Moreover, while some websites chose to link to sites dissimilar to themselves others chose to form distinct online communities of similar websites. The second, more qualitative, method worked to present explanations for this particular pattern of a local hyperlinked network. Thse findings from this complementary research approach point to a nuanced conclusion on the prospects for a local, online networked public sphere.

The distinct homophily effect, revealed by the statistical model point to an overall disconnection in online communications between local government institutions and those members of the public using Web 2.0 applications to express their views on this issue. This particular configuration of the network was not a chance occurrence and this level of fragmentation in the network was underlined by evidence collected by the social actors associated with this network. This may have contributed to a less informed citizen deliberation and decision making on this issue. In this sense a local, web enabled, networked public sphere capable of enhancing the local governance process did not exist.
However, online Media sites and those established by NGOs do appear to be linking up different points of view in the online network and in this way perhaps facilitating a local networked public sphere. Given that these sites were representative of dominant media and commercial interests offline it could be argued that this is not politically transformative but bears more of a resemblance to the “politics as usual” scenario found by Margolis and Resnick (2000). Potentially bucking this scenario, and supporting Norris’s (2001) argument that the Internet may level the political playing field, is the use made of the Web by the ordinary citizens involved in this issue. As one actor acknowledged “…...I honestly don’t know how important the internet was to people who weren’t involved but to activists it was vital”. Moreover, it is the network maps and the political use made of the evident ‘balkanisation’ in the online network by some of these activists that may give succour to Benkler’s view that the Web provides “good enough” links to ensure the ordinary citizen’s voice can be heard over existing power relations.

However, in the local governance context presented here this may not be enough to enhance the relationship between local government and its citizens. If the Web is to be used in the service of local democratic renewal and enhance the local governance process then the evidence here underlines the arguments for policy intervention to nurture and harness the Web’s “vulnerable potential”. Reflecting on how the Web was used during this referendum one actor noted,

for big difficult city region wide issues like this....there would have to be a totally different mechanism in place because it’s simply not reliable as any kind of governance mechanism....its faceless, its anonymous you don’t have to register to post on these sites if you open up any online area for comments on an issue like you will get deluged by antis ..if you want to involve 2.6 million people making a decision...... if you are going cast that in anyway as something you can dump online that requires a lot more thought ...if you use anything like the environment we were using then it leaves it wide open for abuse...

Such a mechanism or “civic commons” as Coleman and Blumler (2009) have suggested, may well be required. However, if it is to operate as a public sphere the evidence here suggests a need to ensure its independence from vested interest and to reconcile the formal governance requirement for citizen identification with the culture of Internet use that can privilege anonymity. Such reconciliation may involve re-conceptualising the nature of citizenship online but this may well be necessary to address the mutual distrust which appears to be feeding the homophily effects apparent within the local online network. Alongside this, there appears to be a requirement, particular amongst those responsible for local government websites, for greater education around the political potential of hyperlinks.
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