Mainstream Media Behavior Analysis on Twitter: A Case Study using UK General Election

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Social Media Become Popular

The Guardian
@guardian
Top stories, special features, live blogs and more.
http://www.guardian.co.uk

BBC Breaking News
@BBCBreaking
Breaking news alerts and updates from the BBC. For news, features, analysis follow @BBCWorld (our World edition) and @BBCNews (our UK edition).
London, UK http://www.bbc.co.uk/news

Channel 4
@C4Insider
The inside line from Channel 4, @4Tweets, @More4Tweets, @Film4, @4Music, @DocsOn4 @DramaOn4 and @ComedyOn4. See lists for all accounts.
http://www.channel4.com

ITV
@ITV
The UK’s largest commercial broadcaster. ITV Viewer Services can be contacted via viewerservices@itv.com or on 0844 881 4150
London http://www.itv.com

The New York Times
@nytimes
Where the Conversation Begins. Follow for breaking news, NYTimes.com home page articles, special features and RTs of our journalists.
New York, NY http://www.nytimes.com
Mainstream Media on Social Media

- Is mainstream media still dominant in social media?
- How can mainstream media spread their influence to public on social media?
Outline

- Dataset Introduction
- Mainstream media bias evaluation
- Intermediary analysis for mainstream media.
- Information diffusion analysis
- Conclusion
UK Election Dataset

- Political Dataset
  - UK general election
  - 8 weeks from March 10\textsuperscript{th} to May 10\textsuperscript{th}
  - 919,662 unique tweets
  - 68,620 unique users
  - 156,370 retweet
  - 3 parties involved
Tweet Distribution

- Labour (59%)
- Conservative (43%)
- Liberal (22%)
Outline

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Tweet statistics

- Labour attracted most attention

<table>
<thead>
<tr>
<th>TV Media</th>
<th>BBC News</th>
<th>Channel 4 News</th>
<th>ITV News</th>
<th>Sky News</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feeds#</td>
<td>9</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Total Tweets#</td>
<td>732</td>
<td>662</td>
<td>112</td>
<td>224</td>
</tr>
<tr>
<td>Conservative</td>
<td>286</td>
<td>258</td>
<td>29</td>
<td>114</td>
</tr>
<tr>
<td>Labour</td>
<td>498</td>
<td>356</td>
<td>48</td>
<td>175</td>
</tr>
<tr>
<td>Liberal</td>
<td>168</td>
<td>154</td>
<td>15</td>
<td>55</td>
</tr>
</tbody>
</table>
Sentiment based Bias Evaluation

- Open Amplify is used to do sentiment analysis.
- Media bias of a media outlet $i$ towards a party $j$ as

$$MediaBias_{ij} = \frac{c_{ij}^{pos}}{c_{ij}^{neg}} - 1 \quad (Equation \ 3)$$

- $c_{ij}^{pos}$ and $c_{ij}^{neg}$ denotes the total number of positive and negative tweets from a media outlet $i$ towards a party $j$.

- Media Bias takes value 0 if there is no bias. And it is positive for positive bias and negative vice versa.
Media Bias Results

- Sky News has clear pro-Conservative bias and con-Labour.
- ITV displays pro-Conservative and con-Labour.
- Channel 4 slightly pro-Labour, and more pro-Liberal
- BBC News is more neutral and displays least bias
Survey of TV Media bias

* Data is from The Media Blog survey about TV Media bias between 19th and 23rd April 2010

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Media Intermediaries Analysis

- Extract all the retweet (RT) behaviors from the dataset.
  - Direct RT: messages retweeted by the followers of the source
  - Indirect RT: retweeted by users that are not the followers of the source.
  - Intermediaries: users who retweet messages from a source user directly.
Media Intermediaries Analysis

- **Initial**: follower number
- **Direct**: audience number after direct retweet
- **Indirect**: audience number after indirect retweet

![Graph showing audience size for different media intermediaries](chart.png)

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Media Intermediaries Analysis

- Intermediaries Contribution to Media Influence. The contribution of intermediary $i$ to user $j$ is denoted as:

$$\text{Support}_{ij} = C_{ij}^{RT} \ast \| \{ k \mid k \in F_j \text{ and } k \notin F_i \} \|$$

- $C_{ij}^{RT}$ denotes the total directly retweet number by an intermediary $j$ of user $i$.
- $F_i$ denotes the number of followers of user $i$.
Top 10 most important intermediaries

- **Node size**: follower number of intermediaries.
- **Link thickness**: directly retweet number

- Little overlap
- 37 distinct users
Top 10 most influential intermediaries

- Classify 37 users into 5 categories
- The majority is journalists followed by bloggers.
Top 10 most influential intermediaries

- Over half of the journalists who serve as intermediaries for these TV media organizations are actually not affiliated with them.
- Sky News has the most journalists as its intermediaries (6 out of 10). The growth rate of the audience size of Sky News is the fastest through direct retweeting.
- Journalists play an important role for expanding influence on Twitter for mainstream media.
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Information Diffusion Analysis

- Extract user account with more than 100 retweet number and classify them into 6 categories.
- Celebrity is the biggest category with 26 users
Information Diffusion Analysis

- *Retweet rate*: the retweet to tweet ratio.
- *Average Retweet times per tweet*: how many times a tweet has been retweeted on average.

<table>
<thead>
<tr>
<th>Category</th>
<th>Avg. Follower No.</th>
<th>Tweet No.</th>
<th>RT Tweets</th>
<th>RT Times</th>
<th>RT Rate</th>
<th>Avg. RT Time Per tweet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celebrity</td>
<td>458944</td>
<td>162</td>
<td>124</td>
<td>7670</td>
<td>0.765</td>
<td>61.855</td>
</tr>
<tr>
<td>Journalist</td>
<td>9277</td>
<td>948</td>
<td>791</td>
<td>9731</td>
<td>0.834</td>
<td>12.302</td>
</tr>
<tr>
<td>Mainstream Media</td>
<td>66060</td>
<td>1856</td>
<td>1502</td>
<td>11476</td>
<td>0.809</td>
<td>7.64</td>
</tr>
<tr>
<td>New Media</td>
<td>4184</td>
<td>4588</td>
<td>1583</td>
<td>7750</td>
<td>0.345</td>
<td>4.896</td>
</tr>
<tr>
<td>Party</td>
<td>7564</td>
<td>2033</td>
<td>1482</td>
<td>17768</td>
<td>0.729</td>
<td>11.989</td>
</tr>
</tbody>
</table>
Bias of varies categories

- Bias exhibited by the Journalist category correlates well with the actual UK election results.
- Accounts relating to political parties, 7 are from the Labour Party.

![Graph showing political bias for different categories.](image)
Conclusion of social media analysis

- Mainstream media outlets rely on intermediaries to propagate information and the majority of their intermediaries is in fact journalists.

- Mainstream media seem lose their dominant position in shaping public opinions during the UK’s general election.

- The Journalist category appears to have the strongest influence as it has the highest retweet rate and gets the highest average retweet times per tweet. Its bias also reflects the actual political landscape in real world.
Thank You!
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