**Rally or Fracture? An Interrupted Time Series Analysis of Elite Communication During Terrorism Events**
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**Context**

**Attack Timeline**
Wednesday, 22 March 2018
- 2:30pm - Attacker jumps the curb, drives towards Parliament, is shot by police
- 2:46pm - Prime Minister May rushed from Parliament to #10

**Literature and Hypothesis**

Hypothesis 1a: One-sided Rally, opposition members signal support for party in power, whether due to agreement or fear of public backlash (Mueller 1970, Parker 1995).

Hypothesis 1b: Ingroup Solidarity, both sides exhibit bipartisan behavior in response to external threat (Moskaledko et al. 2006, Morrison & Ybarra 2008).

Hypothesis 1c: No Detectable Effect, rally is caused by a vacuum of criticism, rather than overt signs of bipartisanship (Shapiro & Page 1988).

Hypothesis 2a: Ephemeral Rally, elite signals degrade quickly (Brody 1991, Meernik & Waterman 1996).

Hypothesis 2b: Durable Rally, elite signals are detected for future.

**Data**

529 MP Twitter Handles
- Party: Leadership Position
- Gender: Military Experience
- Time in office
33,000 Tweets (+/- 115 Hours of attack)

**Methods Challenge**

**Variables**

Dependent Variable:
- $Y$: Count of cross party retweets

Independent Variables:
- $X_t$: Hour relative to the intervention centered at 0 (-115,115)
- $T_i$: A dummy indication pre-intervention (0) or post-intervention (1)
- $F_{i,t}$: Fourier pair cos$(2k\pi t)$, sin$(2k\pi t)$
- $u_{i,t}$: Exposure variable, number of tweets originating in hour $t$ from members in other parties

**Model Specification**

\[ y_{i,t} = \text{pois}(u_{i,t} \theta_i, \omega) \]
\[ \theta_i = \exp(\beta_0 + \beta_1 T_i + \beta_2 X_i + \beta_3 X_i^2 + \beta_4 T_i X_i + \beta_5 T_i X_i^2 + \beta_6 F_{i,t}) \]

Run for 1) All parties with $\# > 1$, 2) subset of three largest parties

**Robustness Checks**

- Seasonality: Augmented Dickey Fuller tests confirm that series is stationary
- Model Specification: Similar results with poisson, negative binomial, zero-inflated models, GAM models
- Running Variable: Similar results with natural cubic splines, base splines

**Results**

Table 1: Quasipoisson Models

<table>
<thead>
<tr>
<th>Party</th>
<th>All Parties</th>
<th>Conservative</th>
<th>Labour</th>
<th>SNP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post</td>
<td>1.482**</td>
<td>2.386**</td>
<td>2.366**</td>
<td>1.852*</td>
</tr>
<tr>
<td></td>
<td>(0.402)</td>
<td>(0.007)</td>
<td>(0.014)</td>
<td>(0.062)</td>
</tr>
<tr>
<td>Hour</td>
<td>-0.012*</td>
<td>-0.010**</td>
<td>-0.003**</td>
<td>-0.012*</td>
</tr>
<tr>
<td></td>
<td>(0.041)</td>
<td>(0.002)</td>
<td>(0.004)</td>
<td>(0.004)</td>
</tr>
<tr>
<td>Hour$^2$</td>
<td>-0.0001*</td>
<td>0.0000*</td>
<td>0.0000*</td>
<td>-0.005*</td>
</tr>
<tr>
<td></td>
<td>(0.0001)</td>
<td>(0.0001)</td>
<td>(0.0001)</td>
<td>(0.0001)</td>
</tr>
<tr>
<td>Post*Hour</td>
<td>0.021</td>
<td>-0.004</td>
<td>0.001</td>
<td>0.425*</td>
</tr>
<tr>
<td></td>
<td>(0.046)</td>
<td>(0.006)</td>
<td>(0.012)</td>
<td>(0.026)</td>
</tr>
<tr>
<td>Post*Hour$^2$</td>
<td>0.0002**</td>
<td>0.002**</td>
<td>0.0001*</td>
<td>-0.035*</td>
</tr>
<tr>
<td></td>
<td>(0.0001)</td>
<td>(0.0002)</td>
<td>(0.0003)</td>
<td>(0.0003)</td>
</tr>
<tr>
<td>Harmonic 1</td>
<td>0.253*</td>
<td>0.102</td>
<td>0.102</td>
<td>1.279**</td>
</tr>
<tr>
<td></td>
<td>(0.139)</td>
<td>(0.136)</td>
<td>(0.161)</td>
<td>(0.264)</td>
</tr>
<tr>
<td>Harmonic 2</td>
<td>0.422**</td>
<td>0.306</td>
<td>0.306**</td>
<td>-0.990*</td>
</tr>
<tr>
<td></td>
<td>(0.122)</td>
<td>(0.225)</td>
<td>(0.141)</td>
<td>(0.046)</td>
</tr>
<tr>
<td>Constant</td>
<td>-10.467***</td>
<td>-10.566***</td>
<td>-10.160***</td>
<td>-12.475***</td>
</tr>
<tr>
<td></td>
<td>(0.438)</td>
<td>(0.492)</td>
<td>(0.492)</td>
<td>(1.756)</td>
</tr>
</tbody>
</table>

Note: SEs Clustered at the MP Level

**Contributions**

- All major parties, including the party in power, significantly increased cross-party retweeting conditional on the number of original content produced by opposition parties.
- Demonstrates important but previously unexplored aspects of inter-party elite behavior and narrative formation using observed data during security events.
- Applied interrupted time series and event analysis methods to social media.
- Original dataset of UK MP accounts and characteristics.

**Future Work**

- Text: Currently this project does not incorporate the content, I plan to use dictionary methods to understand whether the time degradation is due to less Tweeting about the event itself.
- Other Events: There were three terrorist events in the UK in 2017. I would like to purchase portions of the Twitter corpus for these events to see if this pattern holds
- Multilevel: Considering Bayesian multilevel modeling for this project, hope to present these results.

**References**


