The U.S. Presidential Race

Comparing Coverage Across Three Major Sources

Thomas Brawner

Galvanize, Inc.

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Two objectives

- *Is there a difference in coverage?*
  - → Classification Problem
- *What is the difference?*
  - → Topic Modeling
  - → Sentiment Analysis

Data collection

- Scrape *Guardian*, *New York Times*, *Wall Street Journal*
- January to August 2015
- Raw data $\rightarrow$ MongoDB
- Filter on candidates
- TF-IDF, 2000 terms

Multiclass classification accuracy

	Global	Guardian	New York Times	Wall Street Journal
Naive Bayes	0.703	0.414	0.965	0.340
Random Forest	0.905	0.783	0.998	0.809
Gradient Boosting	0.921	0.856	0.983	0.833
N	3757	1018	2087	652

Topic modeling strategy

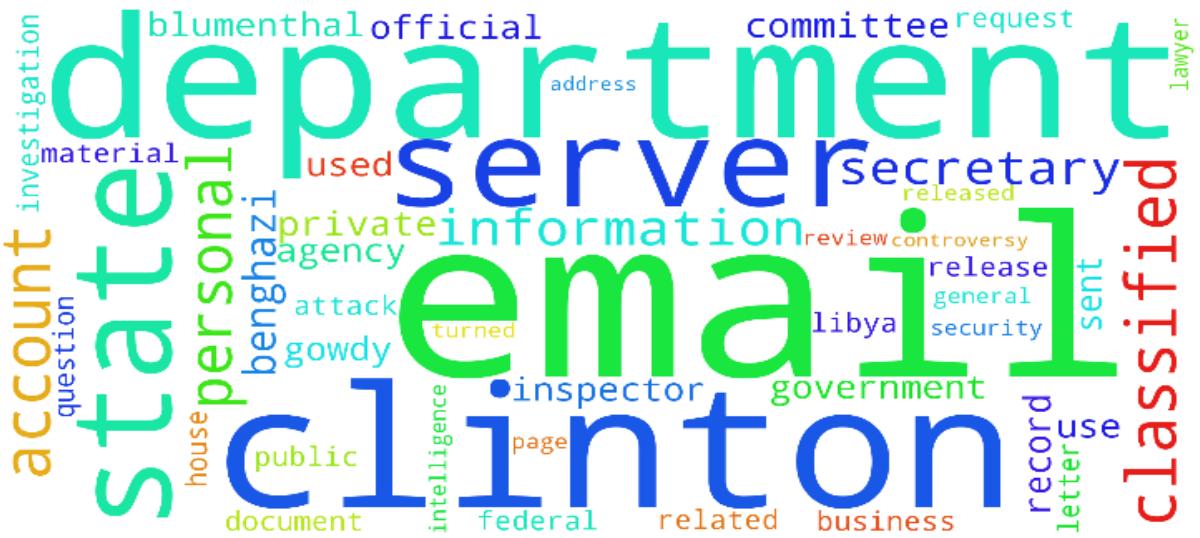
$$\begin{bmatrix} v_{11} & \cdots & v_{1t} & \cdots & v_{1T} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ v_{i1} & \cdots & v_{it} & \cdots & v_{iT} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ v_{N1} & \cdots & v_{Nt} & \cdots & v_{NT} \end{bmatrix} =$$

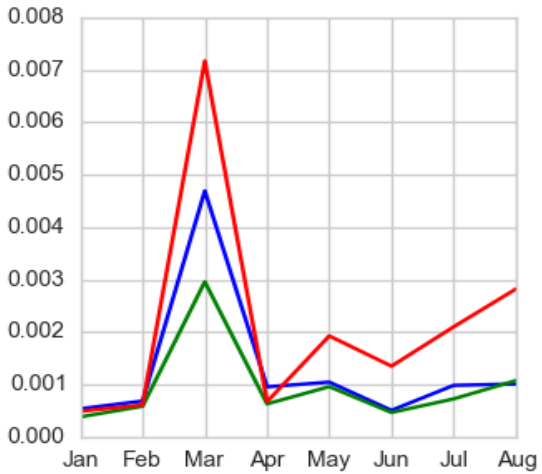
$$\begin{bmatrix} w_{11} & \cdots & w_{1K} \\ \vdots & \ddots & \vdots \\ w_{i1} & \cdots & w_{iK} \\ \vdots & \ddots & \vdots \\ w_{N1} & \cdots & w_{NK} \end{bmatrix} \times \begin{bmatrix} h_{11} & \cdots & h_{1t} & \cdots & h_{1T} \\ \vdots & \ddots & \vdots & \ddots & \vdots \\ h_{K1} & \cdots & h_{Kt} & \cdots & h_{KT} \end{bmatrix}$$

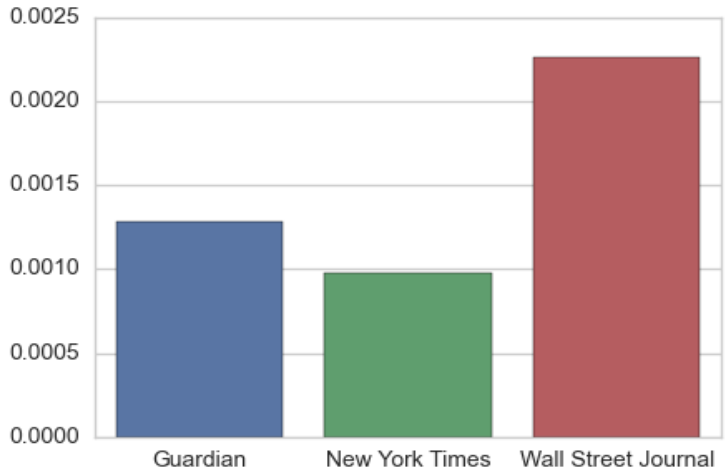
Topic modeling strategy (cont.)

- With $\mathbf{H}_{K \times T}$
  - sort descending for each k
  - top 50 terms $\rightarrow$ Word Cloud
- With $\mathbf{W}_{N \times K}$
  - group by source, month $\rightarrow$ time series
  - group by source $\rightarrow$ bar plots

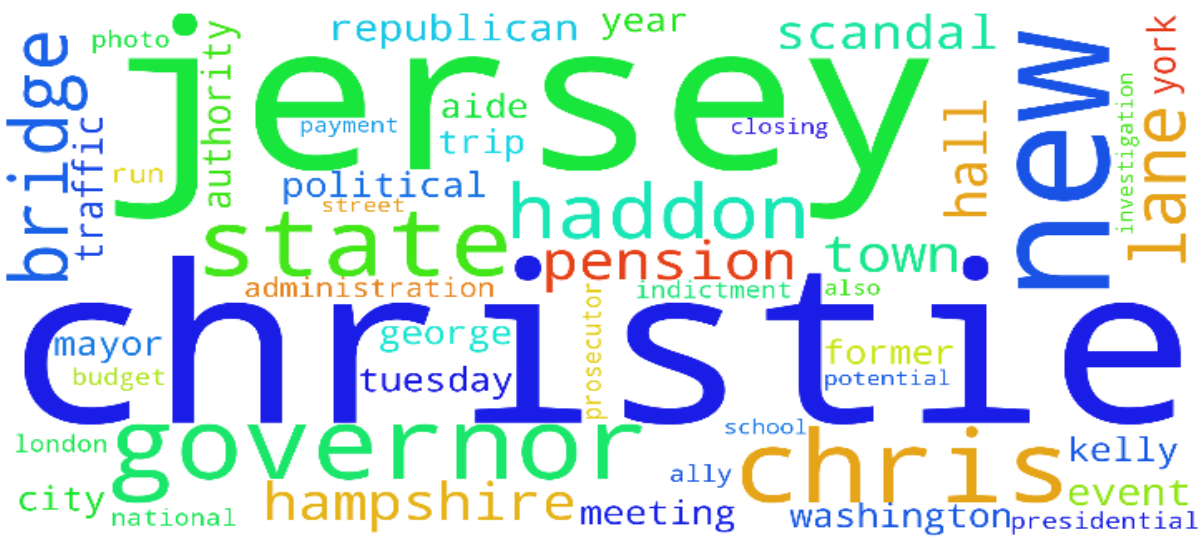
Hillary's Email

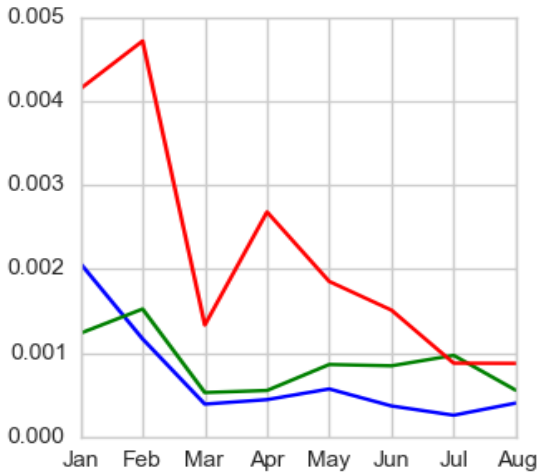


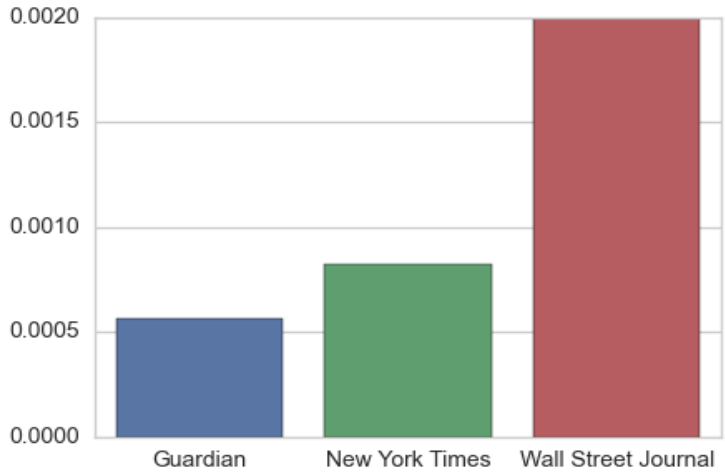




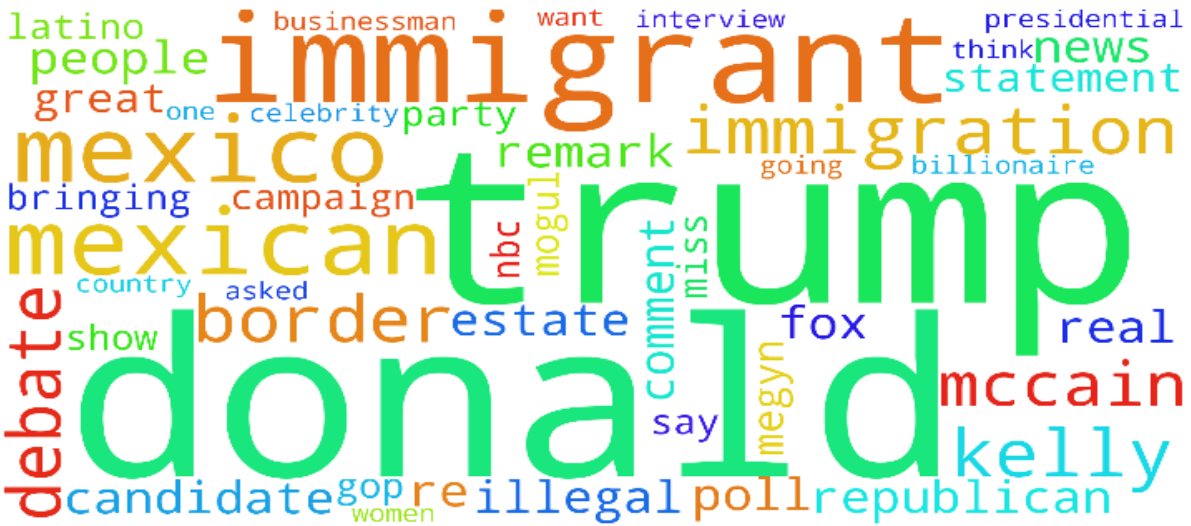
Chris Christie

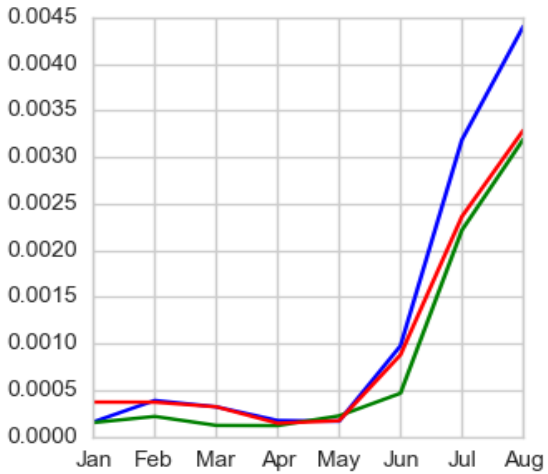


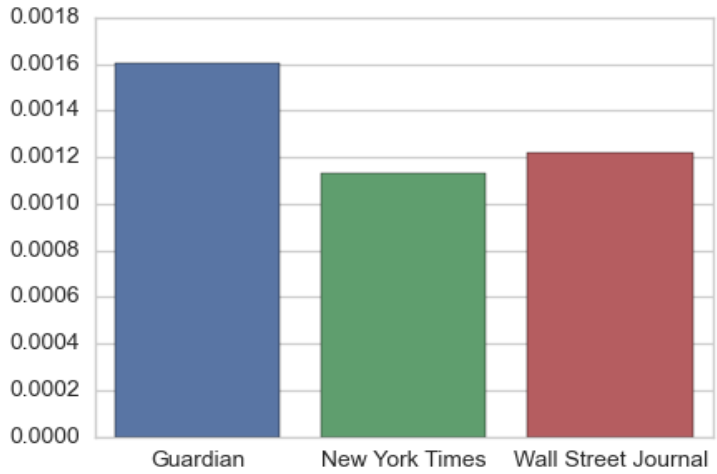




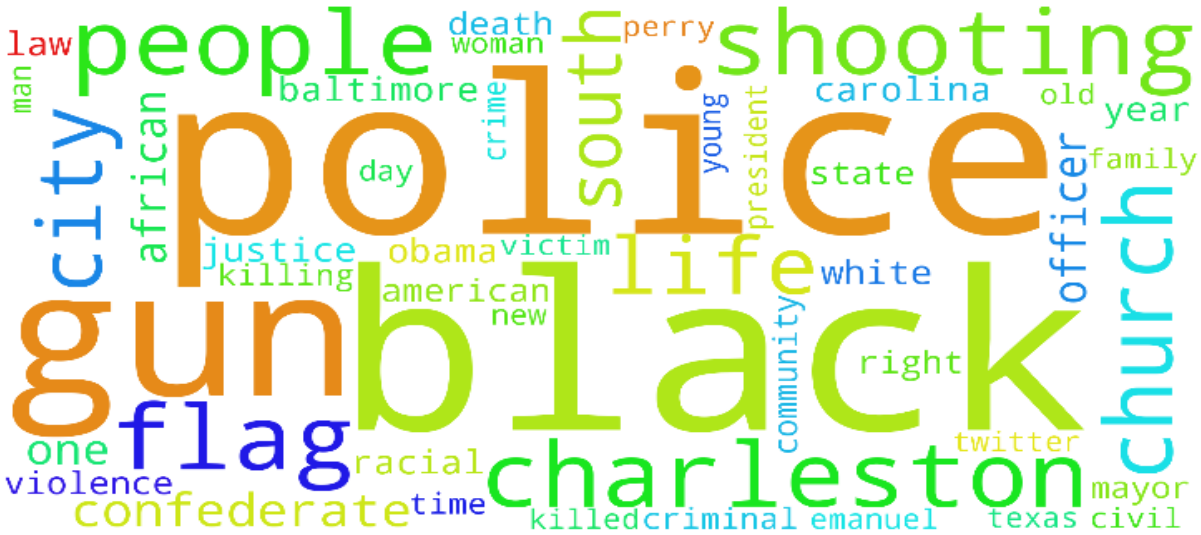
The Rise of Trump

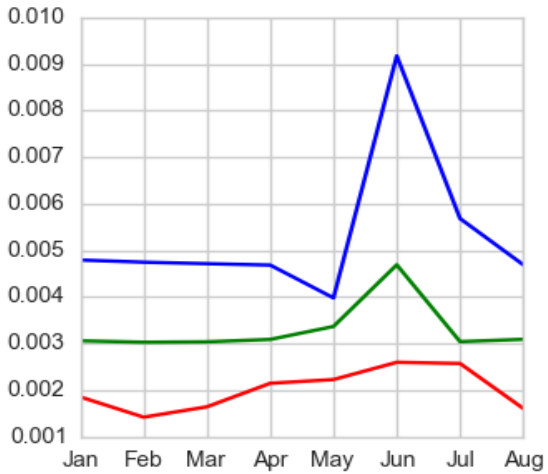


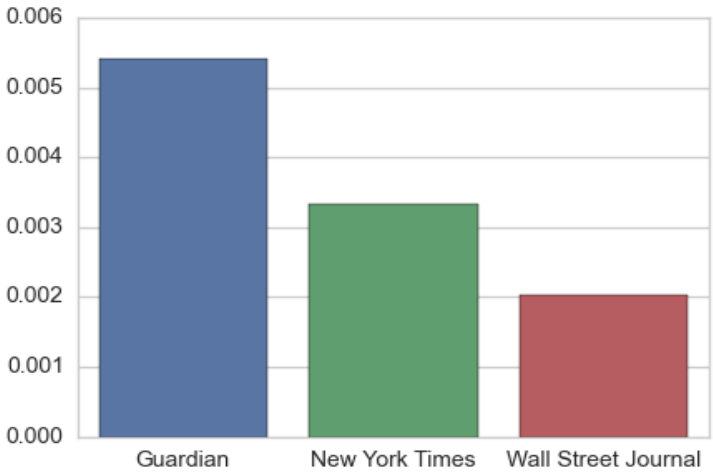




Gun Violence





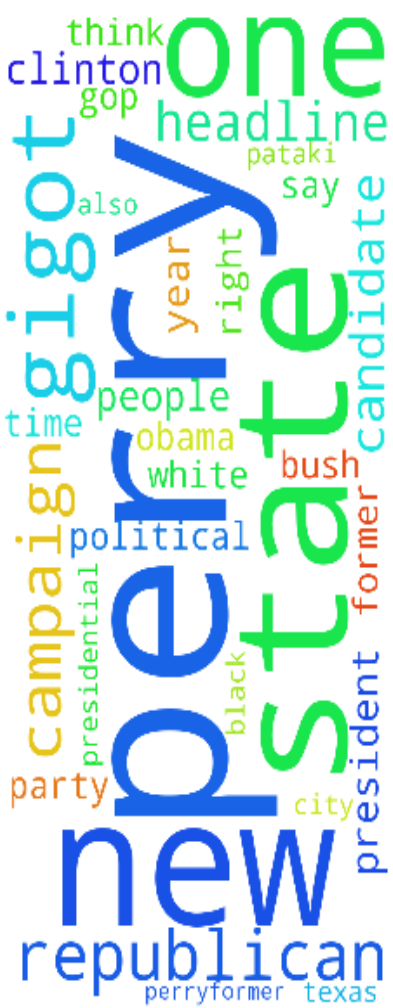


Gun Violence by Outlet

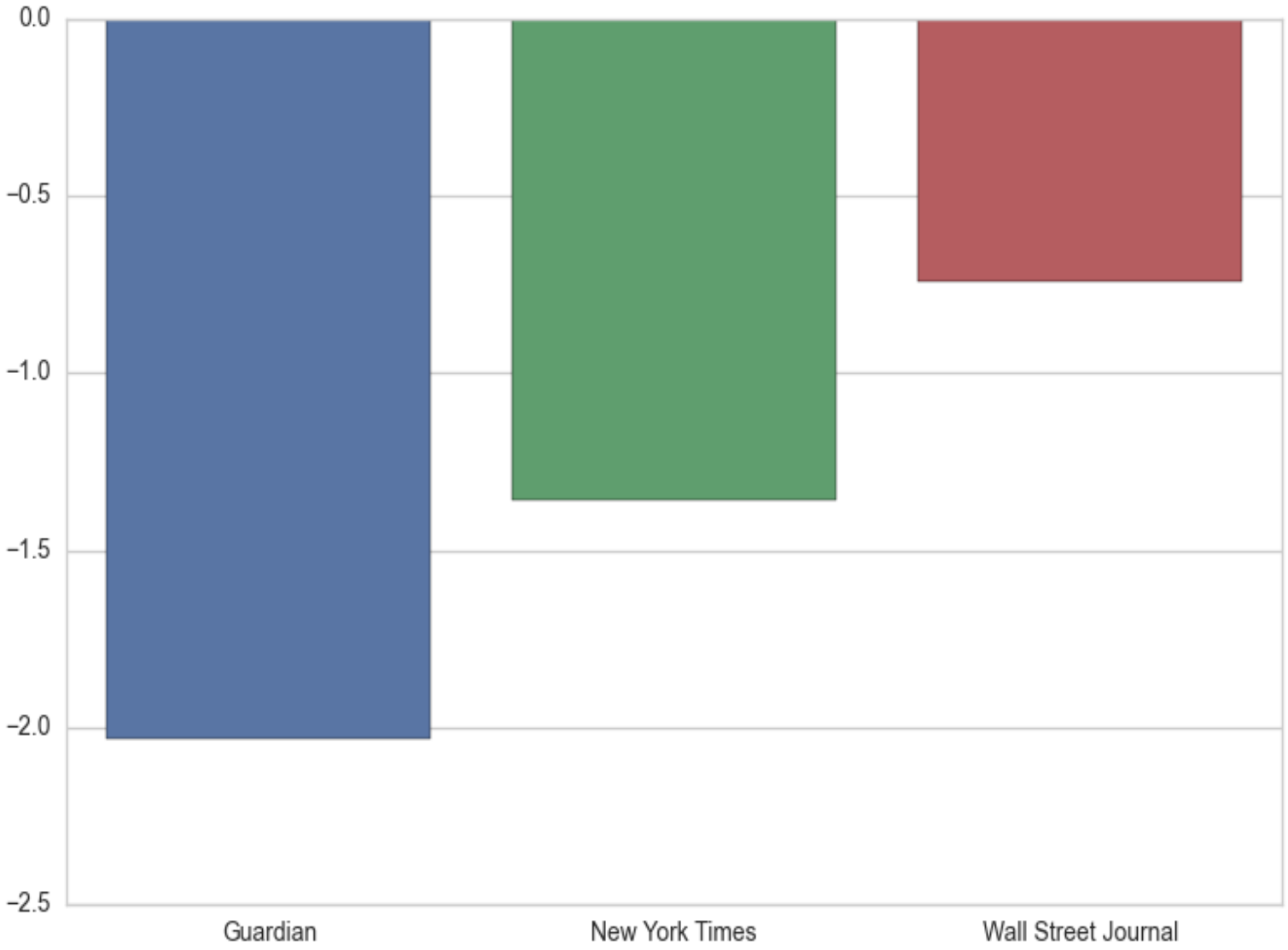
Guardian

New York Times

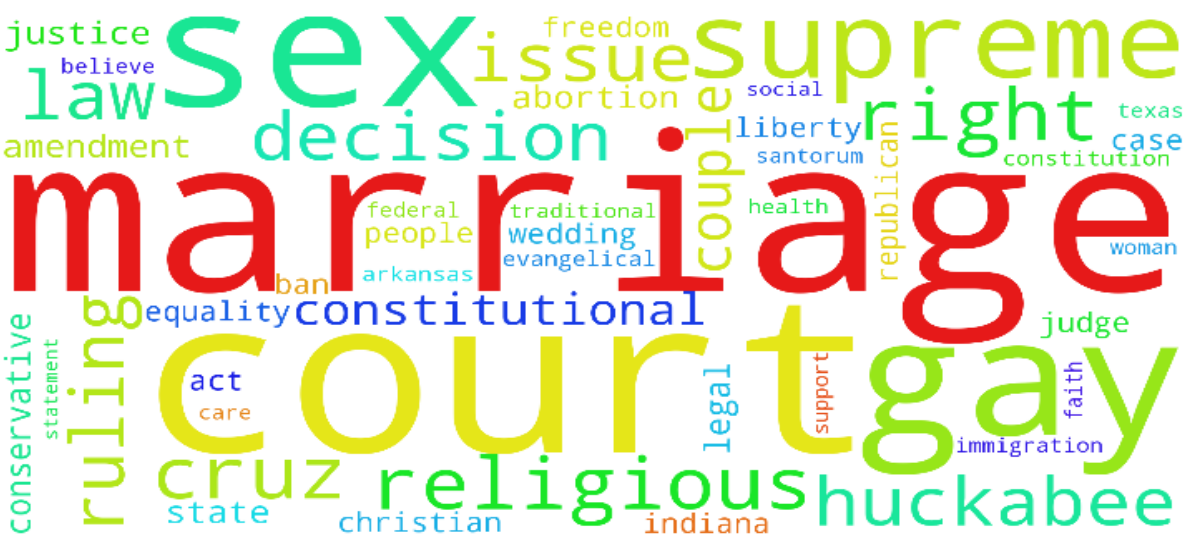
Wall Street Journal

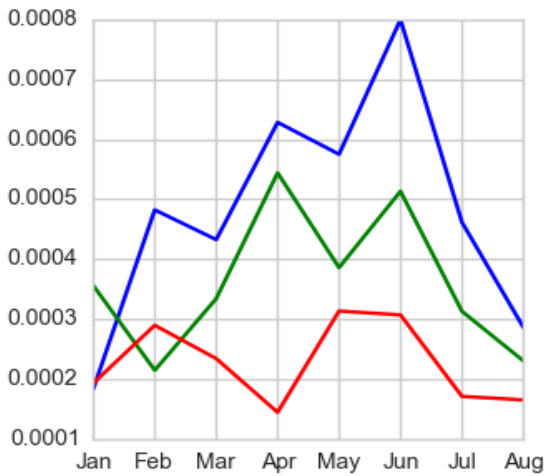


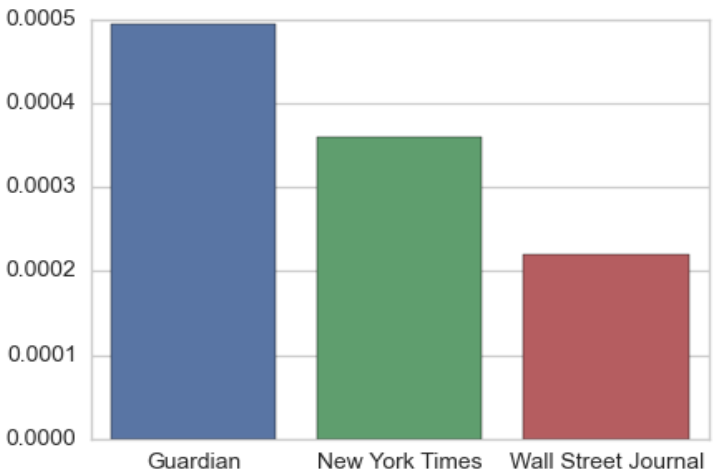
Gun Violence by Outlet



Gay Marriage



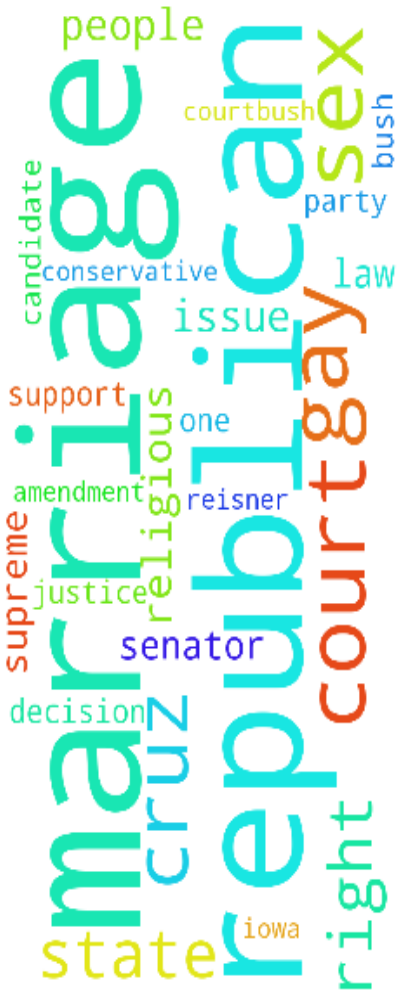




Gay Marriage by Outlet

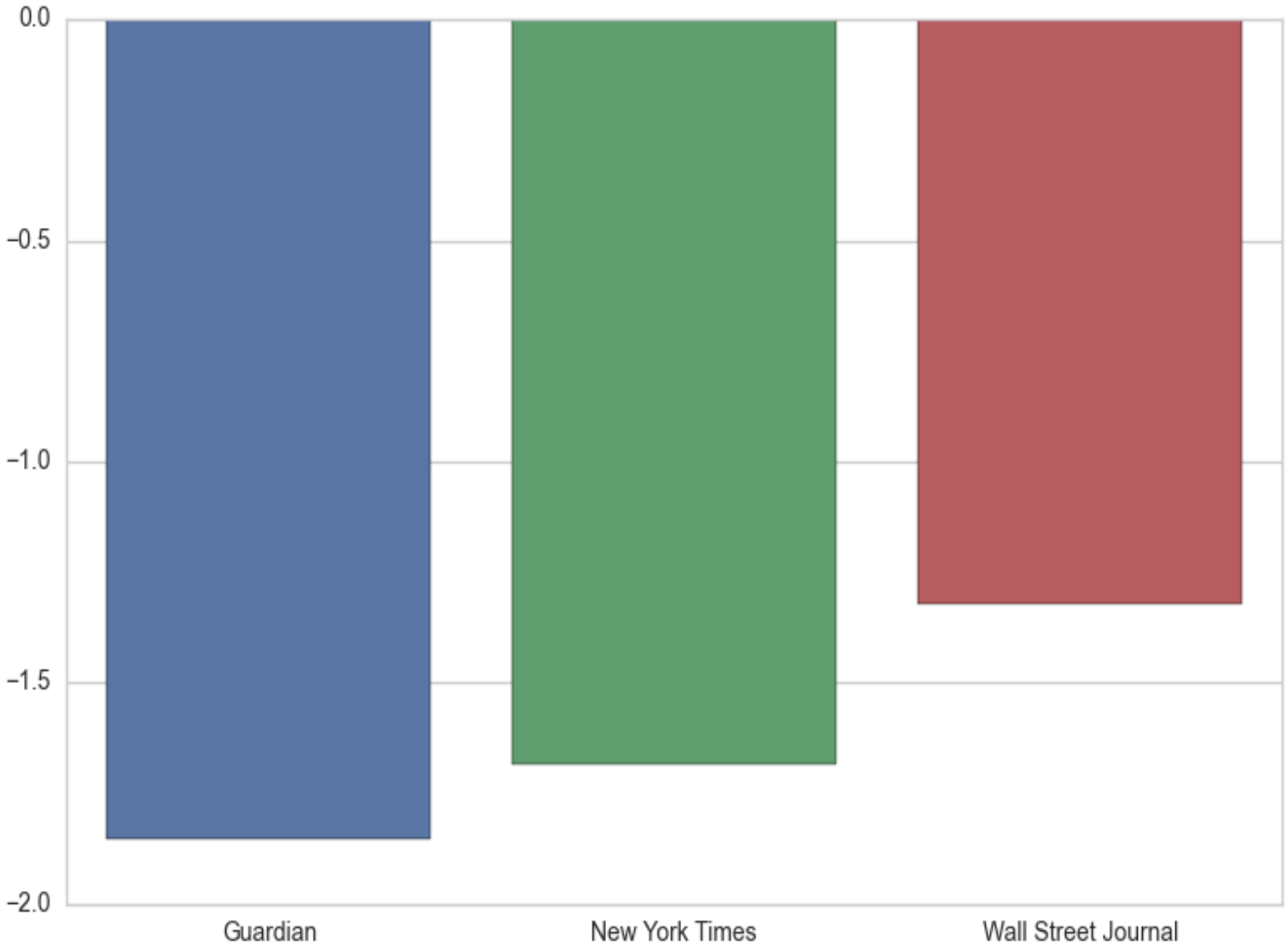
Guardian

New York Times

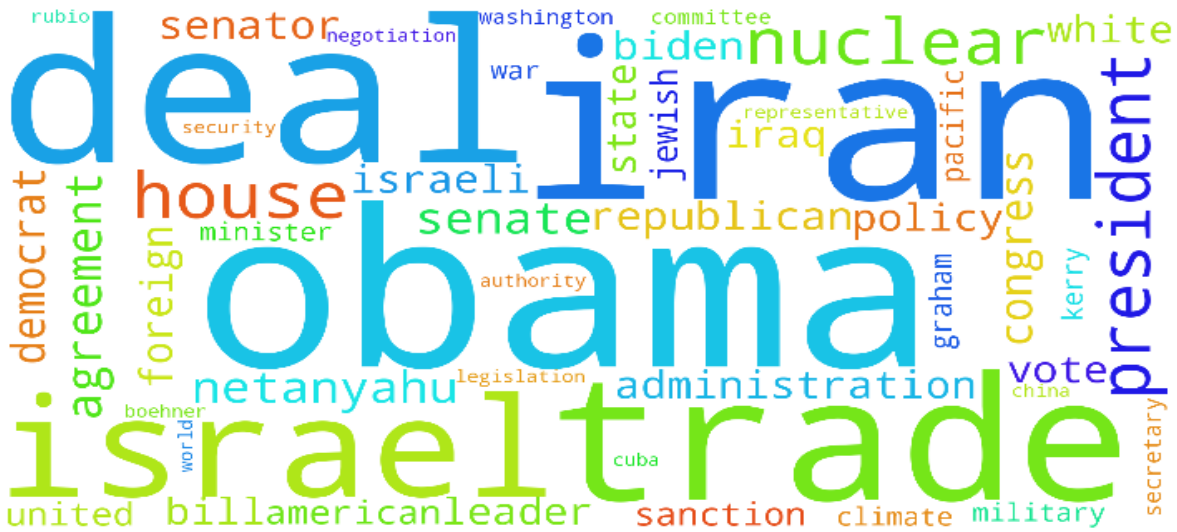


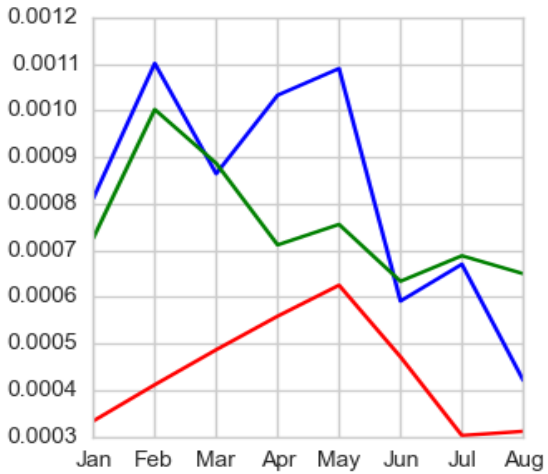
Wall Street Journal

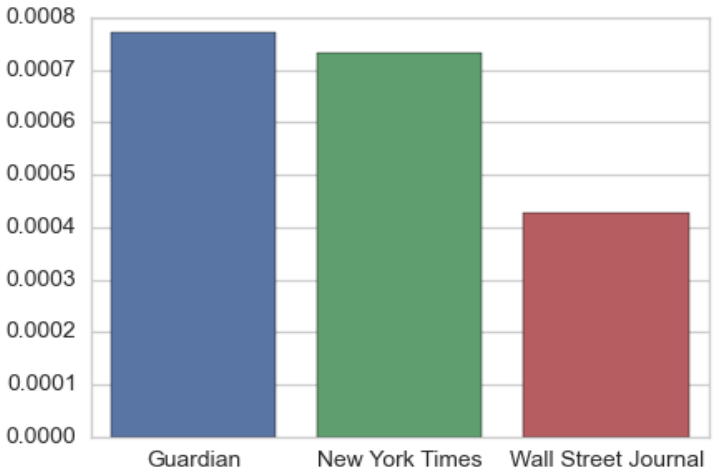
Gay Marriage Sentiment by Outlet



Iran Nuclear Deal







Iran Nuclear Deal by Outlet

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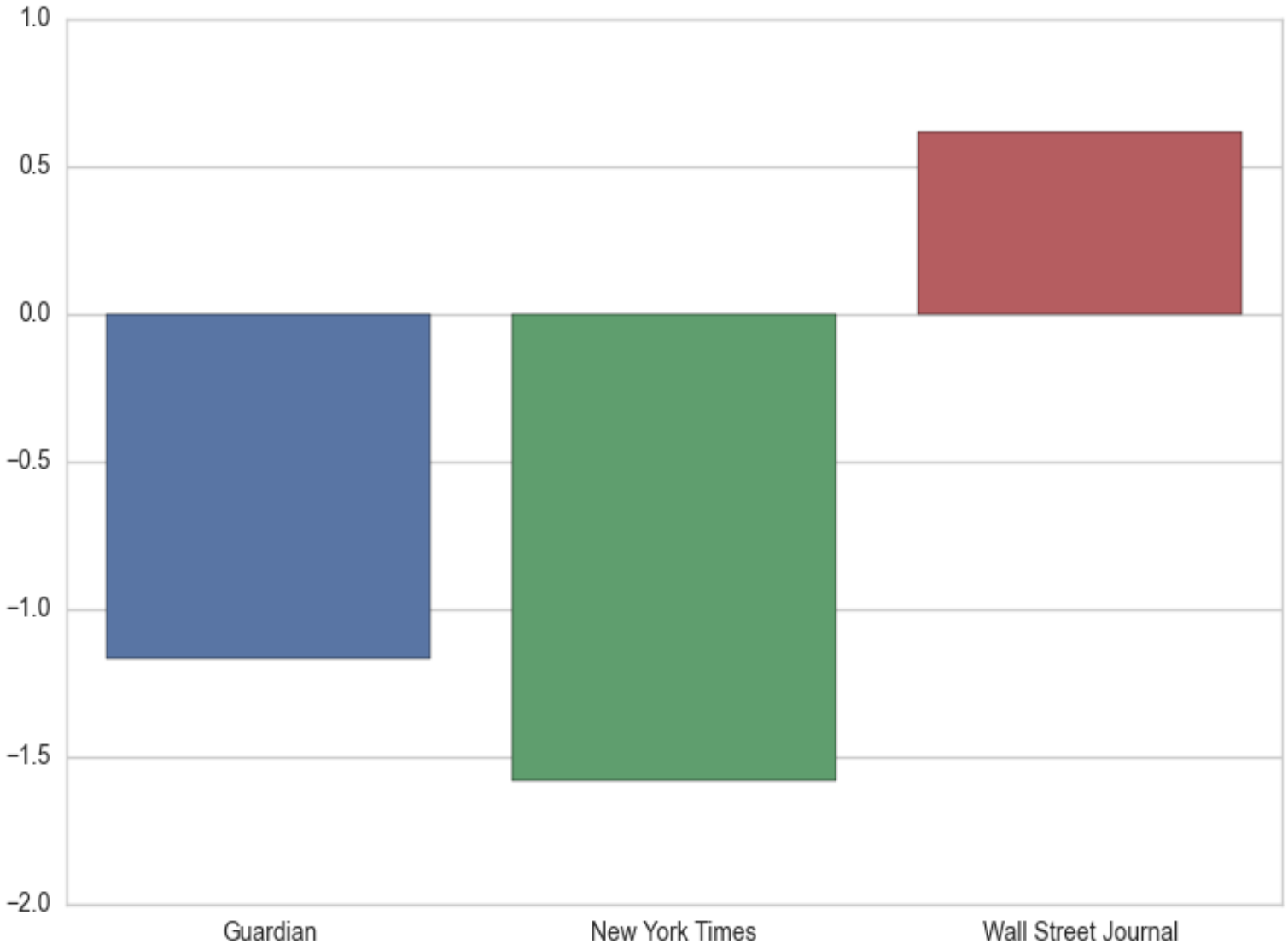

Next steps

- More data: collect through duration of election
- More data: *Washington Post*, *Financial Times*, etc.
- Finer classification model tuning
- What are we misclassifying?