

# Political Discourse on Social Media: Echo Chambers, Gatekeepers, and the Price of Bipartisanship

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**Keywords:** *echo chambers, polarization, filter bubble, political discourse, bipartisanship*

*Echo chambers* have emerged as an issue of concern in the political discourse of democratic countries. There is growing concern that, as citizens become more polarized about political issues, they do not hear the arguments of the opposite side, but are rather surrounded by people and news sources who express only opinions they agree with. It is telling that both Facebook and ex-U.S. Presidents have recently voiced such concerns.<sup>1</sup> If echo chambers exist, then they might hamper the deliberative process in democracy [6].

We study the degree to which echo chambers exist in political discourse on Twitter, and how they are structured. We approach the study in terms of two components: (i) the opinion that is shared by a user, and (ii) the “chamber”, i.e., the social network around the user, which allows the opinion to “echo” back to the user as it is also shared by others. The opinion corresponds to *content* items shared by users, while the underlying social *network* is what allows their propagation. We say that an echo chamber exists if *the political leaning of the content that users receive from the network agrees with that of the content they share*.

As there is no consensus on a formal definition in the literature, we opt for this definition, which is general enough and reasonably captures the essence of the phenomenon. There are, however, a few previous works that have studied echo chambers under different perspectives. For instance, previous works have focused either on the differences between the content shared and read by partisans of different sides [2]; the social network structure [5]; or the structure of user interactions, such as blog linking [1] and retweets [4]. We adopt a definition which is broader in terms of *content* it is based on (it considers all content shared and produced, not only content pertaining to specific types of interactions, e.g., retweets), and which is defined jointly on *content* and *network*.

Specifically, we define production and consumption measures for social media users based on the political leaning of the content *shared with* and *received from* their network. We apply them to several datasets from Twitter, including a large one consisting of over 2.5 billion tweets, which captures 8 years worth of exchanges between politically-savvy users. Our findings indicate there is large correlation between the leaning of content produced and consumed: *echo chambers are prevalent on Twitter* (See Figure 1).

We then proceed to analyze *partisan* users, who produce content with predominantly one-sided leaning, and *bipartisan* users, which instead produce content with both leanings. Our analysis indicates that partisan users enjoy a higher “appreciation” as measured by both network and content features. This finding hints at the existence of a “*price of bipartisanship*,” required to be paid by users who try to bridge echo chambers.

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<sup>1</sup>E.g., Obama foundation’s attempt to address the issue of echo chambers. <https://www.engadget.com/2017/07/05/obama-foundation-social-media-echo-chambers>

Moreover, we take a closer look on *gatekeeper* users, who consume content of both leanings, but produce content of a single-sided leaning. These users are *border spanners* in terms of location in the social network, who remain aware of the positions of both sides, but align their content with one side. They are a small group, which enjoy higher than average network centrality, while not being very embedded in their community.

A predictive model built to identify partisan and gatekeeper users shows that partisan users are relatively easy to identify, gatekeepers prove to be more challenging.

Our study opens the road for further investigation of the echo chamber phenomenon. While establishing the existence of political echo chambers on Twitter, based on a broad definition and measurements over a large volume of data, it also invites a more nuanced analysis of such phenomenon – one that, instead of categorizing users in terms of partisanship, takes into account a variety of user attitudes (e.g., partisans, gatekeepers, and bipartisans). Such analysis might be crucial to understand how to nudge users towards consuming content that challenges their opinion and thus bridge echo chambers. Furthermore, our study shows the interdependence between content production & consumption and network properties in the context of echo chambers. This finding could help us in revisiting existing models for the dynamics of opinion formation and polarization on social networks that take into account not only the opinion spread over the social network, but also its impact of structure of the network itself.

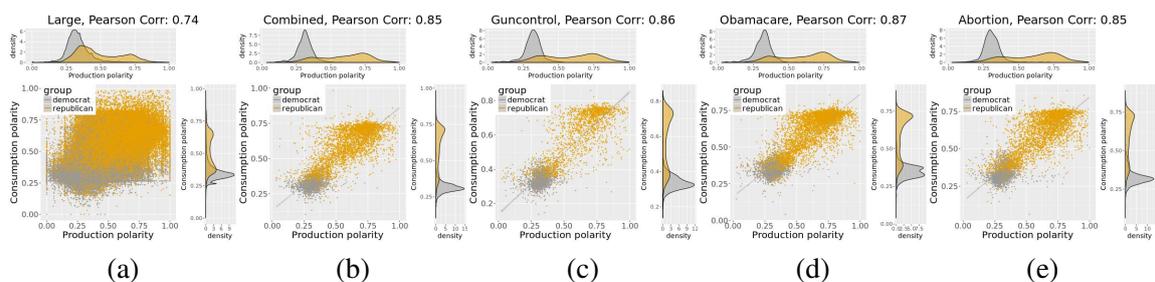


Figure 1: Distribution of production and consumption polarity, for 5 polarizing datasets. The scatter plots display the production ( $x$ -axis) and consumption ( $y$ -axis) polarities of each user in a dataset. Colors indicate user polarity sign, following [3] (grey = democrat, yellow = republican). The one-dimensional plots along the axes show the distributions of the production and consumption polarities for democrats and republicans.

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