Political Figures are More Polarized in Social Media than Traditional Media

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Many concerns have been raised over the potentially polarizing effect of large-scale news sharing behaviors on social platforms, especially when news readers are exposed to content about the political out-group [1]. This is especially salient for ideologically-divisive discourse over political figures, such as Presidential candidates and Senators. However, it is unclear whether established news organizations already publish polarized articles about these figures, or if polarization is limited to the downstream social commentary generated by users. Thus, *how polarized is discourse over political figures in social media compared to traditional media?* Here, we present an analysis of news articles covering political figures shared on Reddit.

Method. We consider all news articles from established, Allsides-rated news sources that were shared as top-level submissions to Reddit from 2008 to 2021 (8.5m in total). We then identify articles about political figures using two steps. First, URLs, submission titles, and comments are tokenized and filtered for common stopwords. Second, tokens are matched against a set of US-based political figures from an expanded GovTrack dataset, including Congress members, Senators, and Presidential candidates from the same period. For example, a link with the subpath *sanders-slams-biden-saying-he-was-wrong-big-time-on-iraq-war* matches Sanders and Biden. Our dataset contains 880K news articles after reducing automated activity.

We then consider two types of polarization: *contextual*, i.e. polarization of *where* political individuals are discussed, and *affective*, i.e. polarization of *how* they are discussed. To address the former, we measure the co-partisanship (i.e. similarity in partisan affiliation) between political figures and the news sources in which they appear, and compare this to the co-partisanship between the figures and online communities. We operationalize partisanship for the figures, i.e. *individual bias*, by their political party (-1 and $+1$ for Democrats and Republicans). Partisanship in news sources, i.e. *media bias*, is operationalized by their Allsides bias rating from -2 (far left) to $+2$ (far right) on the US political spectrum. Finally, partisanship in online communities, i.e. *social bias*, is measured using granular partisanship z-scores from a neural embedding method [2]. Contextual polarization is therefore captured by how much partisans in social and established media sources discuss co-partisan political figures in *in-group* contexts.

For affective polarization, we consider the language surrounding political figures. We collected a 15% sample of the articles that only mention one figure, stratified by publisher. We then tokenized them and applied the LIWC lexicon to both their text and accompanying Reddit commentary. Affective polarization is thus operationalized as the density of positive and negative LIWC emotion words. To minimize confounds by, e.g., left-leaning outlets being systematically more negative, we normalize densities within each Allsides rating bucket, as well as text from binarized left- and right-leaning subreddits.

Results. In what contexts are political figures mentioned, both in articles from traditional media sources and in online political communities that share these articles? Figure 1a plots figures with over 500 mentions in Reddit-linked news articles according to their media and social bias metrics, normalized between all individuals as z-scores. There is a loose correlation between the metrics ($r = 0.68$), suggesting that figures mentioned by partisan news sources are likely to be shared in online communities with similar ideological biases. However, this is inconsistent and varies even between different figures with the party affiliation and color.

Presidential candidates like Michele Bachmann $(-2.2, -0.7)$, the left-most red point, and Julian Castro $(1.8, 0.9)$, the right-most blue point, appear in both out-group social and out-group news contexts. If political figures were only mentioned in co-partisan media and communities, one would expect all the red points to cluster in the top right (and blue dots in the bottom left). However, our results suggest that figures from both political poles are frequently mentioned in anti-partisan news organizations and online communities.

Instead, a different pattern emerges when considering the vertical distance between points and the $x = y$ diagonal, which measures the *relative social partisanship* of political figures given their news partisanship. A negative value (i.e. $x < y$) for a left-leaning figure would indicate that their social media contexts are more co-partisan, and therefore possibly more polarized, than their traditional media contexts. We find that there is a strong relationship between individuals' political party and their relative social partisanship. Consider a Republican (Democrat) figure's media co-partisanship as $1\times$ $(-1\times)$ their mean article Allsides z-score, and, likewise, their social co-partisanship as $1\times$ $(-1\times)$ their mean Reddit submission embedding z-score. In a paired t-test, figures have substantially higher social co-partisanship than media co-partisanship $(p < 10^{-4}, d = 0.8)$, indicating that discourse around politicians is likely much more polarized on social media than in established news sources. This is visualized in Figure 1b, which plots the 10 individuals with the top, median, and bottom relative social partisanship scores. Here, political figures more cleanly separate by their party membership, with notable Democrat and Republican Presidential candidates in the respective bottom and top tails of the distribution.

To what extent is this contextual polarization reflected in the actual content of political discourse? We further find evidence that this discourse is also *affectively* more polarized on social media than in traditional news sources. Figure 1c illustrates the prevalence of LIWC positive and negative emotion words found in the discussions of singular figures, separated by the source of the language – either in news articles or in the accompanying commentary on Reddit. We find, firstly, evidence reflective of in-group love in the elevated positive language for co-partisan figures, and out-group "hate" correspondingly in the negativity of anti-partisan contexts. Secondly, however, this effect appears stronger for social rather than news contexts. We test this by quantifying the positive-negative Δ in emotion z-scores. For in-group, co-partisan mentions of politicians, Reddit commentary had a higher $\bar{\Delta} = 0.08$ than news articles ($\bar{\Delta} = 0.03$, $p < 10^{-16}$), while for out-group mentions, social commentary had a correspondingly lower $\bar{\Delta} = -0.14$ than articles ($\bar{\Delta} = -0.02$, $p < 10^{-20}$). We note that effect sizes here however are slight ($d = 0.04$ and $d = -0.09$); we are currently expanding this analysis to a more complete set of articles and a more refined method for detecting affect.

Conclusion. Our work finds that, although politicians are often discussed in anti-partisan places online, the contexts in which they appear socially are systematically more co-partisan than media contexts in established news outlets. In turn, this suggests that discourse on social media is more polarized, which is further supported by evidence of in- and out-group affective polarization with respectively higher levels of positive and negative emotive language. Efforts to moderate ideological divisions over political individuals should therefore focus on identifying and addressing how polarized social commentary arises from relatively nonpolarized news.

[1] S. Rathje, J. J. Van Bavel, and S. van der Linden, "Out-group animosity drives engagement on social media," *Proceedings of the National Academy of Sciences*, 2021.

[2] I. Waller and A. Anderson, "Quantifying social organization and political polarization in online platforms," *Nature*, 2021.
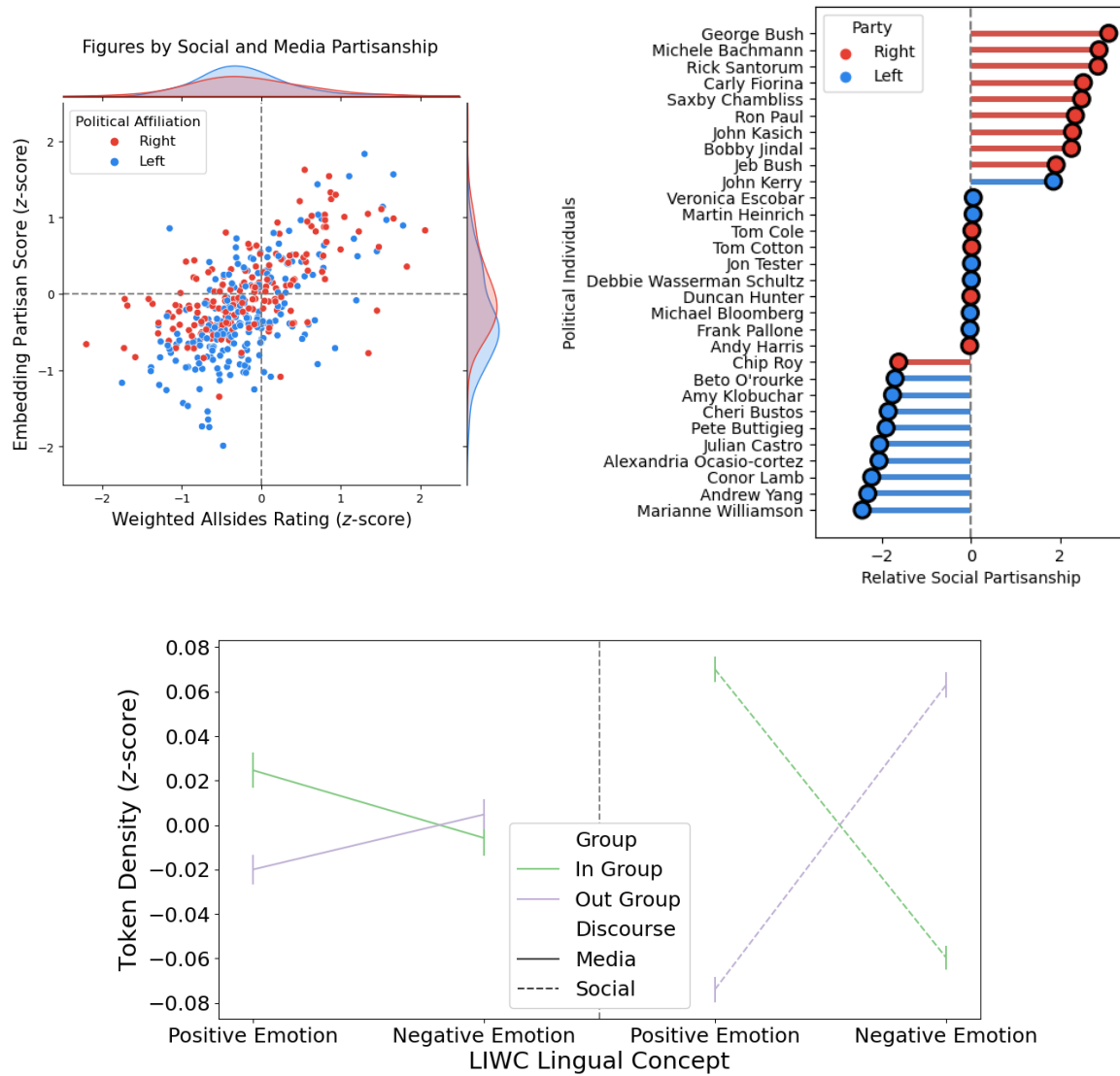
Figure 1: *Left (a)*: Distribution of political figures by media and social bias, measured respectively by a weighted mean over Allsides-rated news sources and a subreddit embedding partisanship score. *Right (b)*: Top, median, bottom 10 figures by relative social polarization in panel (a). *Bottom (c)*: The prevalence of LIWC positive and negative emotion concepts in news sources and subreddits.