RESEARCH ARTICLE

Left- and Right-Leaning News Organizations Use Negative Emotional Content and Elicit User Engagement Similarly

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Abstract

Negativity has historically dominated news content; however, little research has examined how news organizations use affect on social media, where content is generally positive. In the current project we ask a few questions: Do news organizations on Twitter use negative or positive language and which type of affect garners more engagement on social media? Does the political orientation of news organizations impact the affect expressed and engagement tweets receive on social media? The goal of this project is to examine these questions by investigating tweets of 24 left- and 20 right-leaning news organizations (140,358 tweets). Results indicated that negative affect was expressed more than positive affect. Additionally, negativity predicted engagement with news organizations' tweets, but positivity did not. Finally, there were no differences in affect between left- and right-leaning political orientations. Overall, it appears that for news organizations, negativity is more frequent and more impactful than positivity.

Keywords Affect · Political orientation · Social media engagement · Twitter · News

Social media (e.g., Twitter) has accounted for an increasing proportion of online news consumption, with 47% of Americans from a nationally representative sample reporting that they use social media as a means of accessing the news (Newman et al., 2020). This is not surprising given that news outlets are using social media platforms to increase the share-ability of their news, expand their audience, and transcend former geographic barriers (Ahmad, 2014; Newman et al., 2020; Shearer et al., 2015; Usher, 2014). Consequently, news organizations must compete for the attention of and engagement from users on social media by enticing viewership with affective content (Arbaoui et al., 2020; Richards & Rees, 2011; Weaver et al., 2009).

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In this manuscript, we investigated how news organizations use affect on Twitter. To do this, we first asked: Do news organizations on Twitter use more negative or positive language? And what types of content—negative or positive—garner more engagement for news organizations on social media? While predictions regarding the way emotionality is used by news outlets and the way emotions spread are straightforward, the question of whether these outcomes are moderated by political affiliation is much less clear. Some argue that there are inherent differences in the ways political groups express, experience, and react to emotions (Jost et al., 2003; Napier & Jost, 2008; Schlenker et al., 2012). Others find that there are more similarities than differences in emotional expression and reactions between political groups (Iyengar et al., 2012; Roscoe & Christiansen, 2010; Steiger et al., 2019; van Prooijen et al., 2015). Therefore, it is currently an open question as to what extent left- and right-leaning news organizations differ in their expression of positive or negative affect on social media platforms such as Twitter.

Expression and Engagement with Affective Content on Social Media

Emotional language on social media tends to be positive (Kramer et al., 2014; Waterloo et al., 2018); however, there

can be specific topics or users that are exceptions to the rule. One potential case of increased negativity is in content produced by news organizations. As the common adage "if it bleeds, it leads" suggests, news organizations have historically reported more negative news in print and on television (Lengauer et al., 2012; Vliegenthart et al., 2011). Although it is possible that new organizations may conform to the general positivity on social media, it is likely that the same negative language that they express outside of social media is used on these platforms to lure users to the news outlets' websites. As such, we expect news organizations to express more negativity than positivity on social media.

Affective content on social media is more effective at generating user decisions to engage with posts than non-affective content (Hansen et al., 2011; Kramer et al., 2014; Stieglitz & Dang-Xuan, 2013). Though, it is unclear if people engage more (i.e., favorite and retweet) with positive or negative posts on social media (Goldenberg & Gross, 2020). One study compared how moral language versus moral-emotional language in political contexts spreads on social media (Brady et al., 2017). They found that negative moral-emotional language (in regard to politically contentious topics) spreads further within liberal and conservative political networks (Brady et al., 2017). Another study found that within anti-government movements, negative collective emotions resulted in greater activity and spread of information on Twitter (Alvarez et al., 2015). Together, this suggests that negativity leads to more engagement than positivity. However, both of these studies examined affect's role in driving engagement on social media within negative contexts.

Recent work has examined affect's role in driving online engagement in both positive and negative contexts (Schöne et al., 2021). This research indicated that in response to both positive and negative political events, negativity led to greater engagement on Twitter. This highlights the impact that negative emotional language has on the diffusion of content throughout a social network. In the context of traditional news media (e.g., print, television), research also shows that consumers prefer and attend to negative news content more than positive news content (Soroka et al., 2019; Trussler & Soroka, 2014) and engage more with negative print headlines about preferred political candidates (Meffert et al., 2006). Given this evidence, it is likely that negative news content on social media would also lead to more engagement compared to positive content.

Political Orientation and Affect on Social Media

Many news organizations report the news through a political lens (left- or right-leaning; liberal or conservative), rather than being politically neutral (e.g., see AllSides media bias ratings; Media Bias Ratings, 2019). News organizations' political

differences can manifest in many different ways when they report the news. For instance, research in the field of communications indicates that news organizations' political orientation leads to differences in front-page headlines, sizing of articles, accompanying visuals, and the reporting of perspectives of people involved in the news (Shultziner & Stukalin, 2020). Related work suggests that partisan differences may be even greater in online web sources (Baum & Groeling, 2008). However, there is no research that we are aware of that examines if news organizations of differing political orientations express positive and/or negative affect differently.

One way to indirectly evaluate the connection between political orientation and affective news content is by reviewing research comparing political differences in emotional experience. Psychological literature on emotional expression has offered competing perspectives (for a review, see Pliskin et al., 2020). Research has suggested that conservatives have an increased reactivity towards negative emotional stimuli, particularly fear and disgust (Jost et al., 2003; Inbar et al., 2009; Oxley et al., 2008). Several different mechanisms may underlie conservatives' reactivity towards negative stimuli, for instance, increased attentional sensitivity to negative information (Castelli & Carraro, 2011; Hibbing et al., 2014), increased sensitivity to moral purity (Inbar et al., 2009), and/or sensitivity to uncertainty (Jost et al., 2009), all of which are associated with increased negative emotionality. Since news organizations are trying to cater to the sensitivities of their audience, we would assume that conservative news outlets express more negative emotionality in their content to engage their audience. Given that conservatives may be more inherently tuned towards negative stimuli (Castelli & Carraro, 2011; Hibbing et al., 2014), conservative audiences may therefore be more likely to engage with negative content. These two effects may perpetuate each other, leading to both increased emotionality and increased engagement in response to negative emotion.

The above perspective assumes that there are inherent differences in information processing and attention between liberals and conservatives. However, this claim is the cause for contention, and many have argued that there are no inherent differences between liberals and conservatives. Rather, other research finds that emotional expression and reactance are similar across political orientations when directed at a pertinent target (e.g., negativity towards political rivals; Brandt et al., 2014; Steiger et al., 2019; Roscoe & Christiansen, 2010; van Prooijen et al., 2015; Iyengar et al., 2012). In other words, this work finds that liberals and conservatives are similarly influenced by emotional information. If this perspective is true, there is no reason to assume that news outlets would express different emotional content or that their user engagement in response to their content would be different. We aim to explore how left- and right-leaning news organizations express positivity and negativity on Twitter and to what extent

affect relates to the number of engagements these news organizations receive. Our results can contribute to this larger debate about potential differences in political orientations through looking at organizational use of affect and its influence on social media users.

The Current Study

The present study investigated how news organizations express affect on Twitter and the relationship between affect and user engagement on social media. In addition, we explored whether left- vs right-leaning news organizations differed in how much positive and negative affect they expressed. Moreover, we explored if positive or negative affects were better predictors of Twitter engagement for left- or right-leaning news organizations.

Data was collected by extracting the text from social media posts of news organizations on Twitter. Hypotheses for this study were preregistered prior to analysis of the current study (https://osf.io/ej89q/). We hypothesized that (H1) news organizations on Twitter would express more negative affect than positive affect in their tweets[1] since negative affect is more prevalent in other forms of news media. We also hypothesized that (H2) greater levels of negative affect would lead to more engagement (favorites + retweets), but positive affect would not relate to engagement. We further examined whether left- and right-leaning news organizations differed in expressed affect or if political orientation moderated the relationship between affect and Twitter engagement. Considering the disagreement in the literature, we did not have specific predictions for these questions.

Method

Data Collection

We identified news organizations' political leanings from AllSides' media bias rating system (Media Bias Ratings, 2019). Data was collected from 44 news organizations' Twitter accounts (24 left-leaning[2]) on April 29, 2020, using

the package rtweet (Kearney, 2019) in R (R Core Team, 2019). The rtweet package collected the most recent 3200 tweets (or the maximum tweets available) from each account. The collected tweets were tweeted between October 31, 2018, and April 29, 2020. The majority of the tweets (95% of the tweets) were tweeted between January 1, 2020, and April 29, 2020.

Data Processing and Analysis Plan

Tweets without any words were removed from the analysis. The remaining tweets were cleaned for analysis by removing punctuation, symbols, and capitalization. After cleaning, we were left with a total of 140,358 tweets (77,669 left-leaning)[3]. To extract positive and negative affective information contained in each tweet, we conducted a sentiment analysis using VADER (Valence Aware Dictionary and sEntiment Reasoner; Hutto & Gilbert, 2014). VADER is a lexicon and rule-based sentiment analysis tool that was created to capture sentiments expressed in social media contexts (Hutto & Gilbert, 2014). VADER has advantages over other sentiment algorithms because it is sensitive to intensifiers (e.g., very) and is context aware (i.e., some words have multiple meanings, VADER intuits these contextual meanings). VADER outputs positive and negative scores that are ratios for the proportional text that falls into each sentiment category of the VADER sentiment lexicon[4]. Higher scores indicate greater levels of positive or negative sentiment; lower scores indicate less positive or negative sentiment. To measure user engagement with news organizations' tweets, we created an engagement score by adding the number of "favorites" and "retweets" that each individual tweet received. Most news organizations' Twitter posts received few engagements (0–20), yet others received relatively large numbers of engagements (1000 +). As such, the distribution of the engagement scores was positively skewed. To account for the positively skewed distribution, we log + 1 transformed the engagement scores for the subsequent analyses.

All analyses were conducted in R (R core team, 2019). The lmerTest package for R (Kuznetsova et al., 2017) was used to conduct the multilevel model analyses. All analyses controlled for tweet length and the number of followers of each news organization's Twitter account. Due to our large sample size, we used a split-half reliability procedure to test our hypotheses on two random subsets of the entire dataset. The split-half reliability procedure allows us to validate and test the

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[1] This hypothesis was not included in the preregistration. See "Deviations from the Preregistration" document on the OSF page.

[2] Left-leaning accounts: AlterNet, Democracy Now, The Daily Beast, Huffington Post, The Intercept, Jacobin Magazine, Mother Jones, MSNBC, The New Yorker, The Nation, Slate, Vox, ABC, The Atlantic, Buzzfeed News, CBS News, CNN, The Economist, Guardian, NBC news, New York Times, Politico, TIME, Washington Post

Right-leaning accounts: Reason, DC Examiner, Washington Times, Daily Press, Fox News Radio (included instead of Fox News' general account which boycotted Twitter), MarketWatch, OANN, Amconmag, TPostMillennial, Breitbart, NRO, Amspectator, The Blaze, CBN news, Daily Caller, Mail Online, Daily Wire, Federalist, New York Post, Newsmax

[3] A qualitative text network analysis was conducted to explore similarities and differences between the topics of the news organizations' tweets. This analysis indicated that the topics of the left- and right-leaning news organizations were similar. See supplementary materials for more details.

[4] The VADER sentiment positive and negative subscales were originally validated as a combined sentiment score. A validation of the use of these as separate subscales is needed.

robustness of our effects through replicating the analyses within the single dataset. Based on our sample of tweets and the number of represented news organizations, a power analysis indicated that a multilevel model would have 99% power to detect effects as low as d = 0.1 for each split-half reliability test. The simulated power analysis was based on Brysbaert and Stevens' (2018) recommendations and was conducted using the powerlmm package (Magnusson, 2017) in R. This analysis was conducted using the following parameters: total data points (n1 = 70,000; total news organizations (n2 = 44); ICC = 0.05, variance ratio = 0.5).

Results

To determine if positive or negative affect was expressed more by news organizations, we conducted a multilevel model. The model included a random effect for each news organization and fixed effects for valence type (within-subjects factor: positivity, negativity) and political orientation (between-subjects factor: left-leaning, right-leaning; to explore possible differences between political orientations). Results indicated that positivity was expressed less than negativity across left- and right-leaning news organizations (split 1 (B = 0.01, SE = 0.001, $t(140106)$ = -15.1, 95% CI (-0.02, -0.01), $p < 0.001$); split 2 (B = 0.01, SE = 0.001, $t(140610)$ = -17.2, 95% CI -0.02, -0.01)). There was no interaction between valence type and political orientation. These results were consistent across the split-half reliability test, suggesting that results were robust. However, no differences were found between news organizations (positivity (left mean = 0.077, left SD = 0.10, right mean = 0.081, right SD = 0.12); negativity (left mean = 0.091, left SD = 0.11, right mean = 0.096, right SD = 0.13)), suggesting that both left- and right-leaning news organizations expressed similar levels of both negative and positive affect. These results support our hypothesis that similar to print media, the news organizations in our sample used more negative affect to communicate the news on social media. Moreover, these results were consistent across political orientation.

To examine the relationship between affect and the engagement scores of news organizations' tweets, we conducted a multilevel model including a random effect for each news organization and fixed effects for expressed positivity, negativity, and political orientation (left-leaning, right-leaning) to predict Twitter engagement scores. Results indicated that greater tweet negativity predicted greater engagement scores for both left- and right-leaning news organizations (split 1 (B = 0.53, SE = 0.05, $t(70053)$ = 10.7, 95% CI 0.43 to 0.63, $p < 0.001$); split 2 (B = 0.46, SE = 0.05, $t(70305)$ = 9.50, 95% CI 0.37 to 0.56, $p < 0.001$)), but political orientation did not interact with negativity to predict Twitter engagement scores. These results were consistent across the split-half reliability test, suggesting that results were robust. On the other hand,

tweet positivity and its interaction with political orientation did not reliably predict Twitter engagement scores across the splits (split 1 (B = 0.01, SE = 0.05, $t(70053)$ = 0.22, 95% CI -0.09 to 0.11, $p = 0.83$); split 2 (B = -0.02, SE = 0.05, $t(70305)$ = -0.29, 95% CI -0.12 to 0.09, $p = 0.77$)). These results supported our hypothesis that negative, but not positive, affect would predict Twitter engagement scores. Moreover, this suggests that political orientation did not influence the relationship between affect and engagement scores within our sample.

Discussion

The goal of the present study was to investigate how news organizations of different political orientations expressed affect on Twitter and how users engaged with the affective content of these news organizations' tweets. The data was collected during a specific timeframe in which topics, such as the Covid-19 pandemic, may have dominated news coverage across the political spectrum. Given that context, the results indicated that both left- and right- leaning news organizations expressed more negative than positive affect on Twitter. Though social media is positive in general, our work indicates that news organizations' content may be an exception. This finding provides evidence that the adage "if it bleeds, it leads" holds true on social media for both left- and right-leaning news organizations. Importantly, it is noteworthy that we did not find differences between left- and right-leaning news organizations in their expression of positive or negative affect within our sample. As such, the results from this study support the perspective that left- and right-leaning groups may not have inherent differences in their expression of affect.

Our study also suggests that negative news content garners more user engagement than positive content for both left- and right-leaning news organizations. Therefore, negative news spreads farther through the Twitter network than positive news for both left- and right-leaning political networks. These findings may be explained by the fact that negative information is more impactful on attention and behavior than positive information, a phenomenon known as the negativity bias (Baumeister et al., 2001; Vaish et al., 2008). Relatedly, our findings build on research that shows that negative televised news is more emotionally impactful on an audience than positive televised news (Soroka et al., 2019). This indicates that negativity can be used to spread the news to a larger audience through audience engagement. Furthermore, our findings indicate that the negativity bias similarly influences audience engagement for both left- and right-leaning news organizations—supporting the perspective that there are no inherent differences between left- and right-leaning groups.

These results potentially have implications for how negative news influences users' emotions and how negative emotion spreads across the Twitter network. Exposure to another

person's emotions on social media can lead an individual's emotions to become more similar to the emotions of the other person, a process called digital emotion contagion (see Goldenberg & Gross, 2020). As such, it is possible that negative news on social media manifests itself in the mood and political action of users as it spreads across the social media network (Alvarez et al., 2015; Goldenberg & Gross, 2020). Although the extent of the spread and impact of digital emotion contagion is currently unknown, it is possible that a high frequency of negative news may spread negative emotion through the Twitter network.

Limitations and Conclusion

Despite these important insights, additional research is needed to address limitations of the present study. For example, one limitation of this study was the timeframe of data collection. These data were collected within a small window of time and within a specific political context. Since data was collected at the end of April 2020, Covid-19 was a dominant topic in the tweets of both left- and right-leaning news organizations within our collected data (see supplementary materials for more details of a qualitative text analysis of the tweets). The overwhelming Covid-19 coverage may have obfuscated potential affective differences in content covered by left- and right-leaning news organizations. Therefore, future analysis of news organizations' Twitter posts after the pandemic subsides may uncover content differences.

Furthermore, the current data was collected on Twitter, which leans liberal (Wojcik & Hughes, 2019), within the specific political context of a Republican dominated Executive branch and Senate. Right-leaning news organizations' discussion of the news within a Republican-dominated government likely looks different than it would within a Democratic-dominated government. Moreover, users' motivation to interact with specific news organizations' posts may change depending on the political environment. Future work should consider the contextual implications by collecting data across political administrations, social contexts, and social media platforms.

Another limitation of this study is that we are unable to discern the mechanism that causes negative, but not positive, affective content to garner more user engagement. In line with the negativity bias, one possibility is that negative information captures attention and motivates behavior to a greater extent than positive information. Future research should explore mechanisms of the negativity bias and how it may lead users to engage with negative Twitter content more so than positive content.

In sum, this is the first work that we know of to examine how different political orientations influence the affect expressed by news organizations on Twitter. This work suggests that news organizations, regardless of political orientation, express more negativity than positivity on Twitter. Here,

we demonstrate that the classic news adage "if it bleeds, it leads" is maintained on new organizations' social media. Moreover, this negative content seems to translate to greater levels of user engagement. Thus, negative content from news organizations is likely to spread farther than positive content.

Authors' Contributions   Andrea Bellovary and Nathaniel Young conceptualized the study, analyzed the data, and wrote the manuscript. Amit Goldenberg conducted the sentiment analysis and wrote the manuscript.

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