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SOCIAL MEDIA AND THE CHANGING INFORMATION ENVIRONMENT
SENTIMENT DIFFERENCES IN READ VERSUS RECIRCULATED NEWS CONTENT

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Abstract There is reason to believe that an increasing proportion of the news consumers receive is not from news producers directly but is recirculated through social network sites and email by ordinary citizens. This may produce some fundamental changes in the information environment, but the data to examine this possibility have thus far been relatively limited. In the current paper, we examine the changing information environment by leveraging a body of data on the frequency of (a) views, and recirculations through (b) Twitter, (c) Facebook, and (d) email of *New York Times* stories. We expect that the distribution of sentiment (positive-negative) in news stories will shift in a positive direction as we move from (a) to (d), based in large part on the literatures on self-presentation and imagined audiences. Our findings support this expectation and have important implications for the information contexts increasingly shaping public opinion.

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The study of how people form their attitudes and opinions has long acknowledged the importance of ordinary citizens who, given their interest in news, serve as opinion leaders in social networks (Lazarsfeld, Berelson, and Gaudet 1944). In recent years, the importance of information-sharing, from opinion leaders and otherwise, has likely increased as more people receive their news via social network sites (Settle 2018).[1] Consequently, information environments now depend on multiple gatekeepers, not only elites, journalists, and editors, but also the many people who opt to share (or not) the information they see in the news with their social networks. The relationship between these different gatekeepers is endogenous. Media gatekeepers set the agenda for the engaged members of the public; members of the public then act as gatekeepers for everybody else sharing certain stories and not others; the media then write more stories about the topics that members of the public are sharing (Tandoc and Vos 2016).

Past work on news production has focused on the factors that influence journalistic and editorial gatekeeping (for reviews, see Shoemaker and Vos 2009; Soroka 2012). Research on the behaviors and preferences of news consumers, including recent work on "virality" and "shareworthiness," also provides some hints about the motivations that lead people to share certain news content (e.g., Gantz and Trenholm 1979; Marwick and boyd 2011; Berger and Milkman 2012; Trilling, Tolochko, and Burscher 2017; Kalsnes and Larsson 2018). We nevertheless have only a vague sense of how what we might call "network-gatekeeped" news differs, overall, from the traditional news resources from which it is derived.

This limited understanding of gatekeeping is consequential on two levels. First, it means that we know little about how social network sites have changed the information environments people respond to when forming their opinions. There is a vast literature connecting public opinion to media content (e.g., McCombs and Shaw 1972; Iyengar and Simon 1993; Stroud and Kenski 2007; Baum and Potter 2008; Wojcieszak, Azrout, and de Vreese 2018); and there are good reasons to believe that the content of media is changing. Second, it means that we have not been able to capture the news-sharing preferences of the individuals, "opinion leaders" or otherwise, who may have an impact on the news to which others are exposed. In this paper, we address these issues, focusing on the sentiment of the news that people view or share through either social network sites or email.

Our analyses rely on a dataset that tracks the 10 most viewed and shared stories in the *New York Times*, capturing this information twice a day for a period of two months. The data also distinguish between types of sharing: via Twitter, via Facebook, or via email. Data on different types of sharing allow us to consider the relationship between the platform and the content

1. We rely here on the term "social network sites" (SNSs), following boyd and Ellison (2007).

disseminated. Data on viewing versus sharing allow us to distinguish between the types of news people are drawn to (a more private preference) versus the types of news people choose to share with others (a more public statement).

This distinction between the public and the private is pivotal to our argument. Drawing on a burgeoning literature on social network sharing (e.g., Berger and Milkman 2012; Choi 2016), alongside the long-standing body of work on self-presentation (e.g., Goffman 1959), we expect that people do not necessarily share the news content that they are most drawn to. Rather, in line with recent work, we argue that people's sharing decisions are driven by some combination of interest in the news and interest in managing one's self-presentation. A person shares an article as part of a curated body of information intended, in part, to send a (typically socially positive) signal to their online network. Stories that are shared will thus be different from those that are only viewed. More to the point: Stories that are shared will tend to be more positive than stories that are viewed, though the extent of the positivity will depend on the platform a person is using to share and/or receive information.

Our results carry a number of broad implications. People's understanding of the world around them is based on the "pictures in [their] heads" (Lippmann 1922), and these pictures are based, in part, on the news they receive. As more and more people receive news filtered through online social networks, biases that may be peculiar to online information-sharing become magnified. The pictures in people's heads, then, may be dependent not only on what is most newsworthy and important, but on the sharing preferences of their friends and acquaintances who form their in-network opinion leaders. Whether recirculating news content improves or does damage to the accuracy of our impressions of the world around us is as yet unclear. But, as our analysis shows, the news content that reaches us through social network sites is different—more positive—than the content provided by traditional news organizations. This is likely to have consequences for how people turn those pictures in their heads into economic, social, and political evaluations.

Background

Our work is motivated by the intersection of literatures on (a) "two-step" information flows, (b) "self-presentation" and "impression management," (c) news sentiment as driver of attention and sharing, and (d) platform-based differences. We review each of these in turn below.

TWO-STEP FLOWS

Scholars have long suggested that news is spread via a two-step flow of information (Katz 1957). In the first step, interested individuals read and follow news stories; in the second step, these individuals tell others in their networks

about the news. These theories about public opinion formation predate even televised news, but they are especially important today as the news people consume is increasingly governed by the interests and preferences of their social network connections. Indeed, drawing on past work on media gatekeeping (Shoemaker and Vos 2009; Soroka 2012), we may now think about two groups of news gatekeepers. The first are journalists and news outlets, deciding what to publish. The second are ordinary citizens deciding what news to share with others in their networks (Ahn, Huckfeldt, and Ryan 2014; Turcotte et al. 2015; Winter and Neubaum 2016; Carlson 2018).[2]

There is a body of work focused on the characteristics of the citizen-gatekeepers who serve as news sources for their social networks. Some of this work considers the characteristics that make some individuals more likely to follow the news in the first place (Neuman 1986), or whether this propensity varies by issue topic (Iyengar 1990; Bolsen and Leeper 2013). When research has focused on the act of sharing information, the focus has also been on the extent to which people have incentives to be truthful and helpful to others in their social networks (Ryan 2011; Ahn, Huckfeldt, and Ryan 2014; Andersen and Hopmann 2018), on how people distill and describe the news they read to others through informal conversations (Carlson 2018), or whether people with certain personality characteristics are especially likely to share information (Winter and Neubaum 2016). Moreover, opinion leaders can also increase people's trust in the media outlets whose stories they share (Turcotte et al. 2015).

While existing work provides a strong foundation for distinguishing the characteristics of opinion leaders (i.e., people who pay attention to the news directly) versus those whose knowledge of the news comes indirectly through their social networks, the subfield is still developing a sense for the impact that this gatekeeping may have on the news environments that influence attitudes and opinions. Our goal is to focus on these issues by directly investigating which types of news people are most likely to share.

INFORMATION-SHARING AS SELF-PRESENTATION

Sharing news is inherently a social process. While in the past people shared the news they read through conversations with their direct networks, modern forms of electronic communication allow people to share information with others instantaneously, via multiple platforms, and in ways that may reach people who are well outside their immediate social circles. Within this social process, people share stories not only because they believe that the information is important, but also because the story satisfies other requirements relevant to their self-presentation in their social groups and networks.

2. This also fits within the framework of research on "micro-agenda setting" (Wohn and Bowe 2016) and "curated flows" (Thorson and Wells 2016).

Most people, when "in the presence of others," are likely to "mobilize [their] activity so that it will convey an impression to others which it is in [their] interests to convey" (Goffman 1959). Informing others about a news article is an opportunity to engage in this type of strategic behavior (Gantz and Trenholm 1979). From a self-presentation perspective, people's sharing behavior may be influenced (at least in some part) by their beliefs about what may lead others to view them as most impressive (Kim 2015). There is a burgeoning literature on the importance of self-presentation and impression management in social network sites (e.g., Walther 1996, 2007; Zhao, Grasmuck, and Martin 2008; Jung, Song, and Vorderer 2012; Bullingham and Vasconcelos 2013; Seidman 2013; Toubia and Stephen 2013); and a related literature emphasizing the importance of an "imagined audience"—the perception of who one's social network audience is, and the desire to appeal to that audience (Marwick and boyd 2011; Litt 2012; Litt and Hargittai 2016).

The literatures on self-presentation and imagined audiences suggest there are ways in which the selection mechanisms governing sharing decisions by individuals may be different from the selection mechanisms governing decisions by news organizations and journalists.[3] The latter have been well documented elsewhere (see the vast gatekeeping literature, cited above), as well as in work on the sociology of newsmaking (e.g., Schudson 1989; Bennett 1996). In contrast, the factors that affect the decisions of citizen-gatekeepers are only beginning to be explored.

The fast-growing literatures on virality and "shareworthiness" are particularly valuable here. First, factors such as story placement, source trustworthiness, interesting-ness, controversy, and unexpectedness (Kümpel, Karnowski, and Keyling 2015; see also Berger and Milkman 2012; Rudat, Buder, and Hesse 2014) all affect the likelihood that a story will be either read or shared. Bright's (2016) work on the "micromotivations" of sharing further highlights the potential importance of topics and importance cues, while Bobkowski (2015) highlights individual-level differences in perceived "informational utility." The importance of the topic increases the likelihood that a news story will be shared, but ideas about "importance" are varied.

Aspects of this varied notion of importance are related to the self-presentational aspects of sharing. Bright (2016, p. 348) notes that there are certain topics that are "poor candidates" for sharing because they may have a "negative effect on social status" (see also Lee and Ma 2012). Choi (2016) identifies "getting recognition" as a motivation unique to sharing news (as opposed to reading), while Rosenberg and Egbert (2011) highlight the role of personality traits. We take this work as a signal that decisions to share news content are governed by a range of factors related to self-presentation and

3. However, there are also ways in which the two are similar; for example, both groups are drawn to stories that are considered "newsworthy" (Trilling, Tolochko, and Burscher 2017).

imagined audiences. And, while accounting for the many different predictors of sharing is beyond the scope of the present study, we focus on one variable that has been of interest to those studying news making and sharing for some time: the sentiment of a news story.

THE IMPACT OF NEWS SENTIMENT ON READING AND SHARING

Certainly, many factors can affect whether a news story will draw an audience (see Kümpel, Karnowski, and Keyling 2015), but one such factor is the article's "tone" or "sentiment." Here we consider sentiment as the overall positive or negative tone of the article, rather than as its "emotionality," as others have done (e.g., Stieglitz and Dang-Xuan 2013). As in past work, we also consider the sentiment of an article as a characteristic separate from its content (see Young and Soroka 2012). And, as past work shows, while the content of a news story can affect an individual's inclination to read and/or share it, so too can sentiment. Sentiment affects how people think and reason about what they read (Quattrone and Tversky 1988), and article sentiment has been shown in past work to affect both reading and information-sharing behavior.

While some have argued that people are more inspired to share information that is negative in tone (Godes et al. 2005), recent work suggests that it is positively toned information that is more likely to "go viral" due to sharing (Berger and Milkman 2012). This higher likelihood of sharing positively toned information follows from the idea that sharing is a social behavior that relies on impression management; people often believe that the information they share is reflective of their identities (Berger and Milkman 2012). Generally, people prefer to be perceived as positive and to spend their time in the company of those who are positive (Berger 2014). In turn, then, people may be more likely to share articles that help send a message that one is an "upbeat" person (e.g., Marwick and boyd 2011) who hopes to transmit helpful positivity to message recipients (Kim 2015). Certainly, in some cases a person believes that an audience wants (or needs) a negative message, but evidence suggests that more often people perceive it beneficial to "make others feel good rather than bad" (Milkman and Berger 2014, p. 13642).

Sentiment has also been shown to be a key distinguishing factor between the news reported by the media and the content shared online. While much of the news skews toward the negative (Soroka 2012), a good deal of the content posted on social media is actually quite positive (Soroka et al. 2018). Given that both the production and sharing of news are deliberate attempts to appeal to the audience, these patterns likely confirm that different motivations govern news viewership and news sharing.

There nevertheless have been few opportunities to observe how the sentiment of the set of articles people choose to read differs from the subset they choose to share. There are even fewer opportunities to do so for all news—for example, the studies just mentioned only looked at information about the economy. If people

gravitate toward negativity in their sharing behavior, the negative sentiment that is already prevalent in the news is likely to be magnified; sharing might alternatively attenuate the negativity in traditional news content. There is voluminous literature querying the impact that news sentiment may have on political engagement and behavior (the literature is vast, but see Lau 1982; Patterson 1994; Kahn and Kenney 1999). For this reason, the shifting tone of news is of real significance for those interested in public opinion and political behavior.

SHARING NEWS VIA DIFFERENT PLATFORMS

As our expectations about sharing behavior consider the intersection between news sentiment and sharing platform, we next consider what types of sharing behavior we expect across three different platforms: Facebook, Twitter, and email.

First, we note that Facebook and Twitter are somewhat different. Facebook connections are more regularly bidirectional than Twitter connections. Facebook accounts are also typically based on real identities, and include friends from users' real lives (Lampe, Ellison, and Steinfield 2008), while the same is less true for Twitter (Huberman, Romero, and Wu 2009); to this end, "self-documentation" is a significant predictor of Facebook use, but not Twitter use (Alhabash and Ma 2017). Moreover, bonding social capital is higher among Facebook connections than Twitter connections (Phua, Jin, and Kim 2017).

If "social interactions on Facebook are closer than those on Twitter" (Lin and Qiu 2013, p. 437), then we may view Facebook as broadcasting to a narrower, "closer" audience than Twitter—a difference that suggests that self-presentation concerns and imagined audiences may differ across the two platforms. That said, the Facebook "groups" feature may place users into a network beyond their close friends and family, allowing people to share information with thousands of strangers (Conroy, Feezell, and Guerrero 2012). Moreover, research suggests that people treat Facebook posts via the "groups" feature differently than posts that only appear to their closer networks (Das and Kramer 2013). As such, it is not clear (to us) how much of Facebook sharing is among a comparatively close-knit group of friends versus a much broader community.

If we consider platforms for information-sharing on a communicational continuum (French and Bazarova 2017; O'Sullivan and Carr 2018), Twitter and Facebook are closer together than email.[4] While the strength of ties varies across platforms, email recipients are most likely to form the closest ties (French and Bazarova 2017). In turn, sharing via email often involves deliberately targeting information to a specific person (or group of people), most likely with relatively close network ties. If Twitter and Facebook connections often form an abstract,

4. This follows from the theory of masspersonal communication (O'Sullivan and Carr 2018).

"imagined" audience, email provides a clear target audience (Litt and Hargitai 2016). In turn, it may be easier to imagine a reaction to an email than reactions on social media platforms (French and Bazarova 2017).

Since a goal of sharing stories via email is maintaining positive impressions (Ellison, Heino, and Gibbs 2006; Alexandrov, Lilly, and Babakus 2013), people send stories that focus on entertaining topics, and avoid the highly controversial (Boczkowski and Mitchelstein 2012). Also key is the utility of information that is being shared: Kim (2015) finds that people are more likely to use email (rather than another platform) to share articles that offer a specific, target audience proactive steps to improve their lives. Articles that provide this utility are more likely to be positive in valence.

Expectations

We can summarize our premises as follows. First, research suggests that concerns about self-presentation drive information-sharing across a variety of platforms. Second, the literature on sentiment suggests that people are more likely to share positive information with others—a pattern underscored by a desire to present themselves in the most positive light. Finally, different platforms allow for sharing across different types of network ties. Of these platforms, email allows for the most direct form of information-sharing, which may mean that self-presentation concerns—manifested as appearing helpful and useful to others—may be heightened when news is shared via email.

Bringing these ideas together leads us to the following set of expectations about citizen-gatekeeping of news. We expect that the sentiment of articles will shift in a positive direction as it is filtered through social network sites. We also anticipate that the sentiment of news shared through email, where self-presentation concerns may be most clear, will be most positive. To be precise, our expectations are as follows:

H1: The set of news articles people share with others will be more positive in tone than the set of news articles they view privately.

H2: There will be variation across online platforms, where news shared through Facebook will be more positive than news shared through Twitter, and news shared through email will be the most positive.

The aim of the sections that follow is to test these hypotheses, using a database of both reading and sharing articles in the *New York Times*.

Methodology

Investigating how individuals' decisions affect the information environments of their social networks requires a particular research design. First, we need to determine a possible sample of news articles from which these individuals

are choosing. Second, we need to determine which, of this possible sample of articles, are being viewed. Then, from this sample of viewed articles, we need to determine which are being shared, and by what means that sharing occurs. This means that the best approach is to track sharing patterns for news stories, for at least three reasons: (1) it offers a direct measure of the "information environments" across views and different kind of shares; (2) it produces more reliable measures of media use than do typically unreliable self-reported media habits and preferences (e.g., Prior 2009); and (3) it offers more external validity and generalizability than do laboratory experiments, which focus on a very limited sample of articles, and abstractions from the typical reading/sharing environment. To be clear: We examine the effects of reading/sharing preferences, and the resulting information environment (as a potentially profound driver of public opinion), by examining not the preferences themselves but rather the outcomes of those preferences.

We focus here on actual *New York Times* online news content. We rely on the *New York Times* because it is among the largest-circulated newspapers in the United States, and is one of (if not the) "paper(s) of record." It is of course also a standard baseline in content studies of news coverage (e.g., Boydstun 2013). We acknowledge that regular readers of the *New York Times* may differ on a variety of characteristics from those who do not read this newspaper; we do not believe that these characteristics strongly affect sharing behavior. Put differently, while regular readers of the *New York Times* may have different political preferences, income levels, and education levels than people who do not read the *New York Times*, we expect that results based on *New York Times* content will be generalizable at least to other major broadsheet newspapers.[5]

NEWS CONTENT

We collected *New York Times* data between February 18 and April 28, 2015. To do so, we created a macro using Visual Basic that performed an exhaustive scrape of key areas of the website twice a day.[6] The data in the manuscript are

5. That said, this is a testable proposition, and an avenue for further work. There is evidence, however, to suggest that some of the sharing patterns we find here may generalize to at least other English-language newspapers in other parts of the world (Oh, Phan, and Goh 2018). Still, we are cognizant that our results are more likely to generalize to sharing originating from broadsheet newspapers and may not generalize to posts originating on social media (though see Kušan, Strembeck, and Conti 2019).

6. Standard web-scraping platforms and programs (e.g., Outwit, rvest) were unable to extract all of the requested information, as content intermittently experienced html changes, such as an alteration in the font size or heading classification for a particular article. Changes such as this will cause traditional web-scraping programs to skip over these articles. Thus, it was necessary to write a macro that was customized to specific subsections of the *New York Times* website. Using html parsing, we documented the source code for each subsection and noted common changes to the html over a course of three days. For instance, if a text-only article is replaced on the following day by one with embedded video, the source code will change to reflect that. The macro was programmed to run every 12 hours and to export the scraped material to an external file.

based on the full-text content of articles, which were listed on the website as the top 10 most viewed, most emailed, and most shared articles (divided by medium of direct sharing, i.e., Facebook or Twitter). Accordingly, the total number of observations per category (most viewed, most shared on Facebook, etc.) is 1,400 (list of top 10 articles scraped twice a day for 70 days), which are composed of 1,207 unique articles, as each one can appear multiple times across days and platforms.

Note that while others have also relied on *New York Times* data to consider information-sharing patterns (e.g., Berger and Milkman 2012), our approach to data collection provides a somewhat different body of information. First, our data distinguish information-sharing across different platforms (Twitter, Facebook, and email). Second, we collect full-text information on all articles that were in the most-shared lists, while some previous work relies only on the most-shared articles that also appeared on the front page (excluding articles that were heavily shared but did not appear on the front page). Most importantly, unlike prior work we capture the process of citizen-gatekeeping—meaning that we can distinguish between what people read and kept to themselves, and what they read and shared.

SENTIMENT ANALYSIS

Our approach to sentiment analysis is relatively straightforward. We code the sentiment of news content using an automated dictionary-based system. We rely on the Lexicoder Sentiment Dictionary (LSD; Young and Soroka 2012), implemented in the *quanteda* package in R (Benoit et al. 2018). As in prior work, our measure of net sentiment is: *# positive words – # negative words / total # words*. We do not offer validity and reliability tests of the dictionary and measure here, as both have already been tested against human coders and alternative dictionaries using *New York Times* news stories (Young and Soroka 2012; Soroka, Stecula, and Wlezien 2015; Wlezien, Soroka, and Stecula 2017). We do nevertheless confirm our results using other sentiment dictionaries in the Online Appendix. A look at the headlines from the most positive and negative articles, as defined by our measure of net sentiment, provides a good (if rather cursory) sense of what the method captures as well. We include a table of positive and negative headlines in the Online Appendix.

Note that our measure of sentiment captures the balance of positive versus negative words across the entire news article. In so doing, it does not distinguish between the sentiment of a topic (i.e., economic success or natural disaster) or the sentiment of commentary (i.e., an opinion piece about Beyoncé or Trump). Our measure thus captures sentiment, very broadly defined, in line with the view that sentiment, independent of content, matters to news selection. Note also that our hypotheses do not require a model of individual articles—our objective is not to predict whether an individual article is recirculated, but rather to observe shifts in the tone of the news *overall*. We

thus rely primarily on distributions of sentiment, below. Our distributional approach is in line with past work on gatekeeping (e.g., Soroka 2012).

We produce these distributions in the following manner. We first estimate the sentiment of each individual article, based on an application of the LSD to the full-text contents of the articles included in each of our aggregated top-10 databases. We then produce a distribution of tone based on all articles in each database. The distribution of sentiment for viewed articles is thus a combination of all top-10 articles that were viewed; the distribution for emailed articles is a combination of all top-10 articles that were emailed; and so on. Of course, many of the articles appear on multiple top-10 lists—they are viewed *and* recirculated through Facebook, Twitter, and email—which means these articles are part of multiple databases.[7] Some articles also appear on top-10 lists for several days, in which case they may be included in a database multiple times. We keep all cases, so that each database reflects the total population of top-10 articles, even where there are repeated cases; and the databases effectively weight articles by the number of times they remain on a top-10 list. We include examples of the most positive and negative stories in the Online Appendix.

Results

We consider the 1,400 top-10 stories that were viewed, recirculated through Facebook, recirculated through Twitter, and recirculated through email. There is, of course, overlap between each of those databases—as noted above, a story that reaches the top 10 in one category may well reach the top 10 in another. Even so, the distribution of sentiment is different across the four databases. The top panel of figure 1 shows the mean and associated standard error of the mean of sentiment for each of the four databases. The mean for viewed articles is lower than the mean for the other three categories, and all differences are statistically significant.[8] The mean for Twitter-shared articles is lower than Facebook-shared and emailed articles, though only in the latter case is the difference statistically significant.[9] Emailed articles are more positive, and

7. To measure the overlap between any two databases, we compute the proportion of duplicates out of the total number of unique articles that appear in either category. This proportion ranges from 31 percent (most viewed and most emailed) to 57 percent (shared on Twitter and Facebook). We retain the duplicates, as excluding them would bias the results by artificially overinflating differences in sentiment across platforms. The retention of duplicates maintains a conservative test of our expectations.

8. Although we have directional hypotheses, we rely on two-tailed tests of significance. Results for tests of differences in means in this instance are as follows: viewed versus Twitter, $t = 2.58$, $p < 0.001$; viewed versus Facebook, $t = 3.90$, $p < 0.001$; viewed versus emailed, $t = 10.24$, $p < 0.001$.

9. Twitter versus Facebook, $t = 1.30$, $p = 0.19$; Twitter versus emailed, $t = 7.53$, $p < 0.001$.

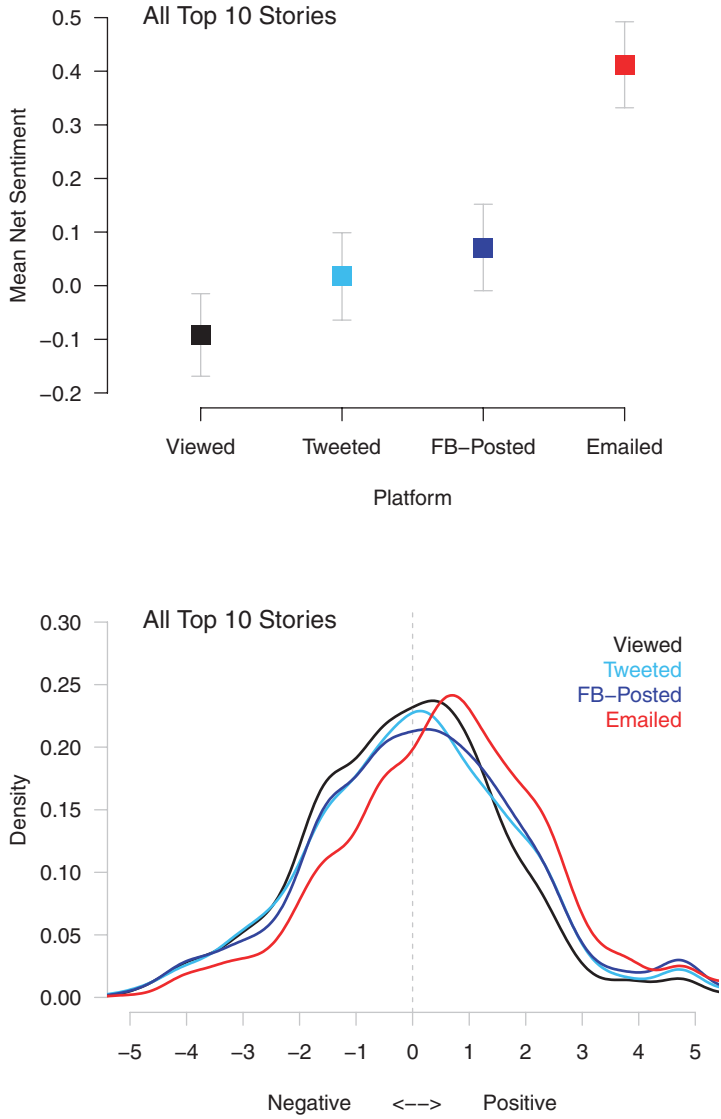

Figure 1. Sentiment in top-ten news stories, based on views, Twitter, Facebook, and email.

statistically different from the other three categories.[10] Differences across platforms are thus as anticipated: News that is shared is more positive than news that is viewed, and the positivity of content increases in platforms likely to involve considerations of self-presentation.

10. The remaining comparison is email versus Facebook: $t = 6.21$, $p < 0.001$.

The bottom panel of figure 1 confirms that the means are not hiding complex differences in distributions. This panel shows a kernel density plot capturing each distribution. Distributions shift in a positive direction as we move from viewed to emailed content. Here too, all differences are statistically significant except for the difference between Facebook- and Twitter-shared content.[11]

ROBUSTNESS CHECKS

We address the robustness of our results by considering different specifications of the data. These different specifications speak to the possibility of alternative explanations, such as that sharing patterns may differ depending on the popularity of the story or the content (political or not). These checks also address methodological considerations such as the sentiment dictionary used in these analyses.

We begin with considerations of popularity. Figure 2 reproduces results based on the top five rather than top 10 articles. In so doing, we test for the possibility that results are stronger (or weaker) when we focus only on the most popular articles. The figure relies on the same *y*-axis as figure 1, in order to highlight that the differences across the four categories do indeed widen slightly when we focus only on the most popular of the most shared/viewed articles. The basic results are the same, however: All pairwise differences in means are statistically different, save for the difference between Facebook- and Twitter-shared content.[12]

We next analyze whether a certain *type* of article is driving the results. If we consider theories of citizens as opinion leaders, most focus on *political* opinion leadership. Since political stories also tend to be controversial, and since people often avoid sharing controversial stories (Bright 2016), focusing on politics forms an especially important test of alternative explanations for our results. Further, considering stories with the same content helps set the role of sentiment into sharper focus. We identify political content using a simple dictionary-based approach, in which we isolate the articles that include at least one of the following terms: Obama, Democrat*, Republican*, Congress*, Senat*, Governor*, or legisat* (where uppercase characters are retained to distinguish titles and names from other uses of these terms). The results are in Online Appendix Figure 1. These results again suggest the greatest sentiment difference between stories shared via email and those viewed; we see comparatively less difference between Facebook and Twitter, consistent with results in figures 1 and 2.

11. Differences are tested using two-tailed Kolmogorov-Smirnov tests: viewed versus Twitter, $D = 0.07$, $p = 0.003$; viewed versus Facebook, $t = 0.79$, $p < 0.001$; viewed versus emailed, $D = 0.18$, $p < 0.001$; Twitter versus Facebook, $D = 0.03$, $p = 0.38$; Twitter versus emailed, $D = 0.15$, $p < 0.001$; Facebook versus emailed, $D = 0.12$, $p < 0.001$.

12. In this case, the difference in means for Twitter versus Facebook yields a t-test of 0.36, $p = 0.72$, and the difference in distributions is $D = 0.03$, $p = 0.97$.

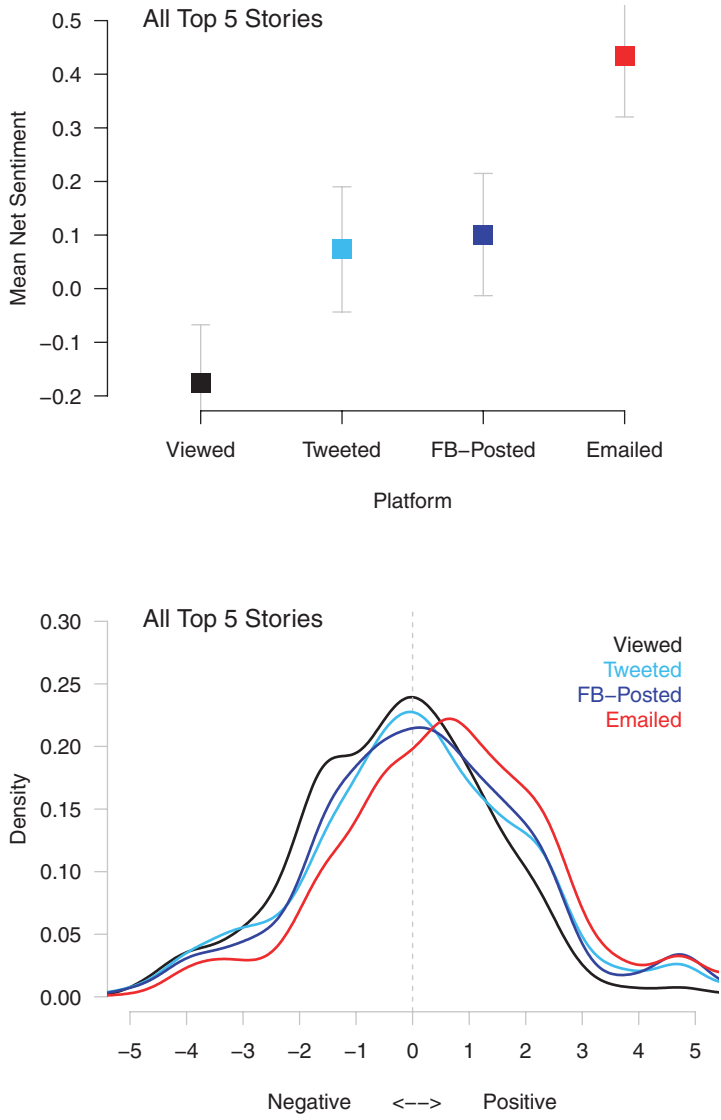

Figure 2. Sentiment in top-five news stories, based on views, Twitter, Facebook, and email.

Next, we estimated sentiment based only on the first 200 words of an article. The decision to view and/or share an article may be affected more strongly by the leading sentences of an article. If the sentiment of the article in this opening is at odds with sentiment in the remainder of the article, or perhaps more sentiment-laden, in order to generate interest, then we might expect

differences in results based on the leading 200 words. Results are illustrated in Online Appendix Figure 2, and highlight an even more stark difference between viewed and emailed stories.

Finally, we also consider whether our results are robust to alternative approaches to capturing the sentiment of news articles. We rely here on two common sentiment dictionaries, also built into the *quanteda* package: the NRC and the AFINN. Results are illustrated in Online Appendix Figures 3 and 4.

Relying on different sentiment dictionaries, we see the same patterns: Positivity is associated with more sharing. The two additional sentiment dictionaries, used for Online Appendix Figures 3 and 4, identify even smaller differences between Twitter- and Facebook-shared news content, but other tests of significance are similar.

Given that results in figure 1 are robust to changes in specification, then, we regard those as strong confirmations of H1 and H2: Although the differences between Facebook and Twitter are rather slight, there are differences from viewed content, to social-media recirculated content, to emailed content. The sentiment of recirculated news content is markedly different from the distribution of viewed news content. We believe this has important implications not only for our understanding of what opinion leaders are sharing with their networks, but also for the news environments affecting public opinion on a wide range of issues, political and otherwise.

Conclusions

News exposure often depends on the decisions made by two gatekeepers: the journalists who decide which topics warrant coverage and the citizen opinion leaders who decide which stories are worth passing along to their networks. Our results suggest that the stories viewed on the *New York Times* website are often more negative than the news that citizen-gatekeepers opt to share. This is most true when the platform by which sharing occurs involves greater considerations about self-presentation. Stories that are shared through email have a more positive sentiment than stories that are shared through Twitter and Facebook. Social status and self-presentation, our results suggest, encourage citizen opinion leaders to gatekeep negativity.

Certainly, the patterns we observe in sharing behavior originating with the *New York Times* do not necessarily mean that social media will be awash with positivity. Negative stories can and often do recirculate through social media platforms. While there is research to suggest that positive events produce the greatest number of likes and shares on Twitter (Kušen, Strembeck, and Conti 2019), recent reports show that highly negative stories can gain a tremendous amount of Facebook attention (Newswhip Report 2019). We also do not suggest that the relative tendency to share positive-sentiment stories is uniform

across social media feeds. Rather, our comparison is relative: The news shared from the *New York Times* has on average a more positive sentiment than the news people read without sharing. That said, we suspect that our results are generalizable, given evidence from other regions of the world (Oh, Phan, and Goh 2018). Put more precisely, we expect that those who follow major broadsheet newspapers are generally exposed to more negativity than is shared through their networks.

There are many possible reasons for the difference between what is read and shared. News tends to focus on the negative because there is no time or reason to report on all of the planes that land safely; given limited attention, we focus on the information that is most necessary for survival, or that requires some kind of change in behavior. This is consistent with theories that the news is negative because of cognitive biases that cause people to attune more to negative information (e.g., Soroka 2012). When the decision shifts from deciding what to view to what to share, however, other concerns may matter. The patterns we show speak to and reinforce research highlighting the possibility that the goal of presenting a positive image to their imagined audience motivates individuals' sharing decisions (Marwick and boyd 2011; Berger and Milkman 2012). More broadly, our work fits within the growing literature on the role of social status maintenance in citizen-gatekeeping (Bright 2016).

Note that we do not explore in detail the extent to which specific news topics drive sharing decisions (beyond the robustness tests in Online Appendix Figure 1). Our emphasis on the sentiment of content is based on accounts of cognitive biases, self-presentation, and impression management that, in our view, suggest that news consumers' considerations of sentiment can be causally prior to considerations of topic. The degree to which this is the case is of course testable; we leave that possibility for future work.

So too is the intersection between sharing decisions and social media algorithms. Algorithms that promote posts that are deemed most likely to be important to a given user (Sethuraman, Vallmitjana, and Levin 2019) could amplify network homophily, as people may be more likely to see news shared by opinion-leaders who agree with them. This is not strictly a social media phenomenon: Opinion-leaders who have the same political preferences can be more influential (Lupia and McCubbins 1998; Ahn, Huckfeldt, and Ryan 2014). Our results, however, focus on the *sentiment* of shared stories—rather than their content. If opinion-leaders are comparatively more likely to share stories with a positive sentiment, then these are the stories people would be more likely to see. In other words, social media may amplify the sharing decisions of opinion leaders embedded in homophilous networks, but the implication of our work is that what is shared may still be more positive than what they encounter in the news.

Although outside the scope of this paper, we can work through an example as a means of underscoring not only the importance of this work, but also pointing to a path for future research. We know that availability biases can

affect individuals' assessments of the probability of something occurring (Tversky and Kahneman 1973). If the news is generally negative, then negative outcomes will be available to people when they judge the consequences of new policies. For example, proposals to build new rail lines will face information environments in which people learn about all the difficulties in building these lines. However, if people are comparatively more likely to share news stories about successes of rail travel, then the idea of a new high-speed rail is more likely to seem more like a real possibility. An important area of future study, as this example suggests, is to track whether it is the media environment or the *shared* media environment that has a closer tie to public opinion fluctuations.

Since media coverage can matter to a wide range of public attitudes, scholars of public opinion must be aware of changes in the nature of mediated information. Foreshadowed by the fast-growing literatures on social network sites and self-presentation, our work illustrates the gatekeeping decisions of people who likely serve as opinion-leaders. Since the influence of an article can depend on its spread beyond the original publisher, identifying sharing behaviors carries broad implications for understanding the formation of a wide range of attitudes.

Supplementary Data

Supplementary data are freely available at *Public Opinion Quarterly* online.

References

Ahn, T. K., Robert Huckfeldt, and John Barry Ryan. 2014. *Experts, Activists, and Interdependent Citizens: Are Electorates Self-Educating?* New York: Cambridge University Press.

Alexandrov, Aliosha, Bryan Lilly, and Emin Babakus. 2013. "The Effects of Social- and Self-Motives on the Intentions to Share Positive and Negative Word of Mouth." *Journal of the Academy of Marketing Science* 41:531–46.

Alhabash, Saleem, and Mengyan Ma. 2017. "A Tale of Four Platforms: Motivations and Uses of Facebook, Twitter, Instagram, and Snapchat Among College Students?" *Social Media + Society* 3.2056305117691544.

Andersen, Kim, and David Hopmann. 2018. "Compensator, Amplifier, or Distractor? The Moderating Role of Informal Political Talk on the Effect of News Media Use on Current-Affairs Learning Among First-Time Voters." *Political Communication* 35:634–54.

Baum, Matthew A., and Philip B. K. Potter. 2008. "The Relationships Between Mass Media, Public Opinion, and Foreign Policy: Toward a Theoretical Synthesis." *Annual Review of Political Science* 11:39–65.

Bennett, W. Lance. 1996. "An Introduction to Journalism Norms and Representations of Politics." *Political Communication* 13:373–84.

Benoit, Kenneth, Kohei Watanabe, Haiyan Wang, Paul Nulty, Adam Obeng, Stefan Müller, and Akitaka Matsuo. 2018. "quanteda: An R package for the Quantitative Analysis of Textual Data." *Journal of Open Source Software* 3:774.

Berger, Jonah. 2014. "Word of Mouth and Interpersonal Communication: A Review and Directions for Future Research." *Journal of Consumer Psychology* 24:586–607.

Berger, Jonah, and Katherine Milkman. 2012. "What Makes Online Content Viral?" *Journal of Marketing Research* 49:192–205.

Bobkowski, Piotr S. 2015. "Sharing the News: Effects of Informational Utility and Opinion Leadership on Online News Sharing." *Journalism & Mass Communication Quarterly* 92:320–45.

Boczkowski, Pablo J., and Eugenia Mitchelstein. 2012. "How Users Take Advantage of Different Forms of Interactivity on Online News Sites: Clicking, E-Mailing, and Commenting." *Human Communication Research* 38:1–22.

Bolsen, Toby, and Thomas Leeper. 2013. "Self-Interest and Attention to News Among Issue Publics." *Political Communication* 30:329–48.

boyd, danah M., and Nicole B. Ellison. 2007. "Social Network Sites: Definition, History, and Scholarship." *Journal of Computer-Mediated Communication* 13:210–30.

Boydstun, Amber E. 2013. *Making the News: Politics, the Media and Agenda Setting*. Chicago: University of Chicago Press.

Bright, Jonathan. 2016. "The Social News Gap: How News Reading and News Sharing Diverge." *Journal of Communication* 66:343–65.

Bullingham, Liam, and Ana C. Vasconcelos. 2013. "'The Presentation of Self in the Online World': Goffman and the Study of Online Identities." *Journal of Information Science* 39:101–12.

Carlson, Taylor. 2018. "Modeling Political Information Transmission as a Game of Telephone." *Journal of Politics* 80:348–52.

Choi, Jihyang. 2016. "Why Do People Use News Differently on SNSs? An Investigation of the Role of Motivations, Media Repertoires, and Technology Cluster on Citizens' News-Related Activities." *Computers in Human Behavior* 54:249–56.

Conroy, Meredith, Jessica T. Feezell, and Mario Guerrero. 2012. "Facebook and Political Engagement: A Study of Online Political Group Membership and Offline Political Engagement." *Computers in Human Behavior* 28:1535–46.

Das, Sauvik, and Adam Kramer. 2013. "Self-Censorship on Facebook." Proceedings of the Seventh International AAAI Conference on Weblogs and Social Media, Cambridge, MA, July 8–10, 2013. Available at https://www.aaai.org/ocs/index.php/ICWSM/ICWSM13/paper/viewPaper/6093, accessed March 21, 2020.

Ellison, Nicole, Rebecca Heino, and Jennifer Gibbs. 2006. "Managing Impressions Online: Self-Presentation Processes in the Online Dating Environment." *Journal of Computer-Mediated Communication* 11:415–41.

French, Megan, and Natalya N. Bazarova. 2017. "Is Anybody Out There? Understanding Masspersonal Communication Through Expectations for Response Across Social Media Platforms." *Journal of Computer-Mediated Communication* 22:303–19.

Gantz, Walter, and Sarah Trenholm. 1979. "Why People Pass on News: Motivations for Diffusion." *Journalism Quarterly* 56:365–70.

Godes, David, Dina Mayzlin, Yubo Chen, Sanjiv Das, Chrysanthos Dellarocas, Bruce Pfeiffer, Barak Libai, Subrata Sen, Mengze Shi, and Peeter Verlegh. 2005. "The Firm's Management of Social Interactions." *Marketing Letters* 16:415–28.

Goffman, Erving. 1959. *The Presentation of Self in Everyday Life*. New York: Anchor.

Huberman, Bernardo, Daniel M. Romero, and Fang Wu. 2009. "Social Networks That Matter: Twitter Under the Microscope." *First Monday* 14. doi:10.5210/fm.v14i1.2317.

Iyengar, Shanto. 1990. "Shortcuts to Political Knowledge: The Role of Selective Attention and Accessibility." In *Information and Democratic Processes*, edited by John A. Ferejohn and James H. Kuklinski. Chicago: University of Chicago Press.

Iyengar, Shanto, and Adam Simon. 1993. "News Coverage of the Gulf Crisis and Public Opinion: A Study of Agenda-Setting, Priming, and Framing." *Communication Research* 20:365–83.

Jung, Younbo, Hayeon Song, and Peter Vorderer. 2012. "Why Do People Post and Read Personal Messages in Public? The Motivation of Using Personal Blogs and Its Effects on Users' Loneliness, Belonging, and Well-Being." *Computers in Human Behavior* 28:1626–33.

Kahn, Kim Fridkin, and Patrick J. Kenney. 1999. "Do Negative Campaigns Mobilize or Suppress Turnout? Clarifying the Relationship between Negativity and Participation." *American Political Science Review* 93:877–89.

Kalsnes, Bente, and Anders Olof Larsson. 2018. "Understanding News Sharing Across Social Media: Detailing Distribution on Facebook and Twitter." *Journalism Studies* 19:1669–88.

Katz, Elihu. 1957. "The Two Step Flow of Communication: An Up-to-Date Report on an Hypothesis." *Public Opinion Quarterly* 21:67–81.

Kim, Hyun Suk. 2015. "Attracting Views and Going Viral: How Message Features and News-Sharing Channels Affect Health News Diffusion." *Journal of Communication* 65:512–34.

Kümpel, Anna, Veronika Karnowski, and Till Keyling. 2015. "News Sharing in Social Media: A Review of Current Research on News Sharing Users, Content, and Networks." *Social Media + Society* 1:2056305115610141.

Kušen, Ema, Mark Strembeck, and Mauro Conti. 2019. "Emotional Valence Shifts and User Behavior on Twitter, Facebook and Twitter." In *Influence and Behavior Analysis in Social Networks and Social Media*, edited by Mehmet Kaya and Reda Alhajj, 63–83. Switzerland: Springer Nature.

Lampe, Cliff, Nicole B. Ellison, and Charles Steinfield. 2008. "Changes in Use and Perception of Facebook." In *Proceedings of the ACM 2008 Conference on Computer Supported Cooperative Work–CSCW '08*, 721–30. San Diego: ACM Press. Available at http://portal.acm.org/citation.cfm?doid=1460563.1460675, accessed September 17, 2018.

Lau, Richard R. 1982. "Negativity in Political Perception." *Political Behavior* 4:353–77.

Lazarsfeld, Paul F., Bernard Berelson, and Hazel Gaudet. 1944. *The People's Choice: How a Voter Makes Up His Mind in a Presidential Campaign*. New York: Duell, Sloan, and Pierce.

Lee, Chei Sian, and Long Ma. 2012. "News Sharing in Social Media: The Effect of Gratifications and Prior Experience." *Computers in Human Behavior* 28:331–39.

Lin, Han, and Lin Qiu. 2013. "Two Sites, Two Voices: Linguistic Differences between Facebook Status Updates and Tweets." In *Cross-Cultural Design. Cultural Differences in Everyday Life*, edited by P. L. Patrick Rau, 432–40. Berlin, Heidelberg: Springer Berlin Heidelberg.

Lippmann, Walter. 1922. *Public Opinion*. New York: Free Press Paperbacks.

Litt, Eden. 2012. "Knock, Knock. Who's There? The Imagined Audience." *Journal of Broadcasting & Electronic Media* 56:330–45.

Litt, Eden, and Eszter Hargittai. 2016. "The Imagined Audience on Social Network Sites." *Social Media + Society* 2:2056305116633482.

Lupia, Arthur, and Mathew McCubbins. 1998. *The Democratic Dilemma: Can Citizens Learn What They Need to Know?* New York: Cambridge University Press.

Marwick, Alice E., and danah boyd. 2011. "I Tweet Honestly, I Tweet Passionately: Twitter Users, Context Collapse, and the Imagined Audience." *New Media and Society* 13:114–33.

McCombs, Maxwell, and Donald L. Shaw. 1972. "The Agenda-Setting Function of Mass Media." *Public Opinion Quarterly* 36:176–87.

Milkman, Katherine, and Jonah Berger. 2014. "The Science of Sharing and the Sharing of Science." *Proceedings of the National Academy of Sciences of the United States of America* 111:13642–49.

Neuman, W. Russell. 1986. *The Paradox of Mass Politics: Knowledge and Opinion in the American Electorate*. Cambridge, MA: Harvard University Press.

Newswhip Report. 2019. "2019 Guide to Publishing on Facebook." Available at https://go.newswhip.com/2019_03-FacebookPublishing_LP.html, accessed March 21, 2020.

Oh, Hyelim, Tuan Q. Phan, and Khim Yong Goh. 2018. "Are You What You Tweet? The Impact of Sentiment on Digital News Consumption and Social Media Sharing." Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3215634, accessed March 21, 2020.

O'Sullivan, Patrick B., and Caleb T. Carr. 2018. "Masspersonal Communication: A Model Bridging the Mass-Interpersonal Divide." *New Media & Society* 20:1161–80.

Patterson, Thomas E. 1994. *Out of Order.* New York, NY: Vintage Books.

Phua, Joe, Seunga Venus Jin, and Jihoon (Jay) Kim. 2017. "Uses and Gratifications of Social Networking Sites for Bridging and Bonding Social Capital: A Comparison of Facebook, Twitter, Instagram, and Snapchat." *Computers in Human Behavior* 72:115–22.

Prior, Markus. 2009. "Improving Media Effects Research through Better Measurement of News Exposure." *Journal of Politics* 71:893–908.

Quattrone, George, and Amos Tversky. 1988. "Contrasting Rational and Psychological Analyses of Political Choice." *American Journal of Political Science* 82:719–36.

Rosenberg, Jenny, and Nichole Egbert. 2011. "Online Impression Management: Personality Traits and Concerns for Secondary Goals as Predictors of Self-Presentation Tactics on Facebook." *Journal of Computer-Mediated Communication* 17:1–18.

Rudat, Anja, Jürgen Buder, and Friedrich Hesse. 2014. "Audience Design in Twitter: Retweeting Behavior Between Informational Value and Followers' Interests." *Computers in Human Behavior* 35:132–39.

Ryan, John Barry. 2011. "Social Networks as a Shortcut to Correct Voting." *American Journal of Political Science* 55:753–66.

Schudson, Michael. 1989. "The Sociology of News Production." *Media, Culture & Society* 11:263–82.

Seidman, Gwendolyn. 2013. "Self-Presentation and Belonging on Facebook: How Personality Influences Social Media Use and Motivations." *Personality and Individual Differences* 54:402–7.

Sethuraman, Ramya, Jordi Vallmitjana, and Jon Levin. 2019. "Using Surveys to Make Newsfeed More Personal." *Facebook News.* https://about.fb.com/news/2019/05/more-personalized-experiences/

Settle, Jaime E. 2018. *Frenemies: How Social Media Polarizes America*. New York: Cambridge University Press.

Shoemaker, Pamela J., and Tim P. Vos. 2009. *Gatekeeping Theory*. New York: Routledge.

Soroka, Stuart, Mark Daku, Dan Hiaeshutter-Rice, Lauren Guggenheim, and Josh Pasek. 2018. "Negativity and Positivity Biases in Economic News Coverage: Traditional Versus Social Media." *Communication Research* 45:1078–98.

Soroka, Stuart N. 2012. "The Gatekeeping Function: Distributions of Information in Media and the Real World." *Journal of Politics* 74:514–28.

Soroka, Stuart N., Dominik A. Stecula, and Christopher Wlezien. 2015. "It's (Change in) the (Future) Economy, Stupid: Economic Indicators, the Media, and Public Opinion." *American Journal of Political Science* 59:457–74.

Stieglitz, Stefan, and Linh Dang-Xuan. 2013. "Emotions and Information Diffusion in Social Media—Sentiment of Microblogs and Sharing Behavior." *Journal of Management Information Systems* 29:217–48.

Stroud, Natalie Jomini, and Kate Kenski. 2007. "From Agenda Setting to Refusal Setting: Survey Nonresponse as a Function of Media Coverage Across the 2004 Election Cycle." *Public Opinion Quarterly* 71:539–59.

Tandoc, Edson C., and Tim P. Vos. 2016. "The Journalist Is Marketing the News: Social Media in the Gatekeeping Process." *Journalism Practice* 10:950–66.

Thorson, Kjerstin, and Chris Wells. 2016. "Curated Flows: A Framework for Mapping Media Exposure in the Digital Age." *Communication Theory* 26:309–28.

Toubia, Olivier, and Andrew T. Stephen. 2013. "Intrinsic vs. Image-Related Utility in Social Media: Why Do People Contribute Content to Twitter?" *Marketing Science* 32:368–92.

Trilling, Damian, Petro Tolochko, and Bjorn Burscher. 2017. "From Newsworthiness to Shareworthiness: How to Predict News Sharing Based on Article Characteristics." *Journalism & Mass Communication Quarterly* 94:38–60.

Turcotte, Jason, Chance York, Jacob Irving, Rosanne M. Scholl, and Raymond J. Pingree. 2015. "News Recommendations from Social Media Opinion Leaders: Effects on Media Trust and Information Seeking." *Journal of Computer-Mediated Communication* 20:520–35.

Tversky, Amos and Daniel Kahneman. 1973. "Availability: A Heuristic for Judging Frequency and Probability." *Cognitive Psychology* 5:207–32.

Walther, Joseph B. 1996. "Computer-Mediated Communication: Impersonal, Interpersonal, and Hyperpersonal Interaction." *Communication Research* 23:3–43.

———. 2007. "Selective Self-Presentation in Computer-Mediated Communication: Hyperpersonal Dimensions of Technology, Language, and Cognition." *Computers in Human Behavior* 23:2538–57.

Winter, Stephan, and German Neubaum. 2016. "Examining Characteristics of Opinion Leaders in Social Media: A Motivational Approach." *Social Media + Society*. doi:10.1177/2056305116665858.

Wlezien, Christopher, Stuart Soroka, and Dominik Stecula. 2017. "A Cross-National Analysis of the Causes and Consequences of Economic News." *Social Science Quarterly* 98:1010–25.

Wohn, Donghee Yvette, and Brian J. Bowe. 2016. "Micro Agenda Setters: The Effect of Social Media on Young Adults' Exposure to and Attitude Toward News." *Social Media + Society* 2. doi:10.1177/2056305115626750.

Wojcieszak, Magdalena, Rachid Azrout, and Claes de Vreese. 2018. "Waving the Red Cloth: Media Coverage of a Contentious Issue Triggers Polarization." *Public Opinion Quarterly* 82:87–109.

Young, Lori, and Stuart N. Soroka. 2012. "Affective News: The Automated Coding of Sentiment in Political Texts." *Political Communication* 29:205–31.

Zhao, Shanyang, Sherri Grasmuck, and Jason Martin. 2008. "Identity Construction on Facebook: Digital Empowerment in Anchored Relationships." *Computers in Human Behavior* 24: 1816–36.