

Gender and Political Party Differences in U.S. Governors' Twitter Use on COVID-19: Findings from January 2020 to April 2021

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Background

In the United States (U.S.), governors' recommendations and policies have played a key role in COVID-19 testing and prevention, and consequently infection and fatality rates.^{1,2} Policy response to COVID was strongly partisan, with Democratic-led states more likely than Republican-led states to issue prevention activity mandates (e.g., mask wearing, stay-at-home orders).^{2,3} Research has also noted Democratic-led states to be more likely to have higher COVID-19 testing rates and lower positivity rates, between March and December 2020.⁴ Governors' communication messaging plausibly had an influence on these observed outcomes, as suggested by prior research on press briefings among U.S. governors.³

Gender is also believed to have some effect on COVID-19 outcomes, based on global evidence indicating that nations led by women are more likely than nations led by men to issue stay-at-home mandates earlier and to see lower COVID-19 fatality rates.⁵ This type of gender analysis of political leaders has not been conducted in the U.S., a concern, given prior research suggesting that American women politicians are more likely to focus on health and welfare concerns as compared to their male counterparts.⁶ This study examines U.S. governors' COVID-19 messaging on Twitter by gender and political party; we focus on Twitter given its common use by politicians for public communication during the pandemic.¹

Our Approach

This study analyzed tweets posted by the official accounts of governors of 50 states of the U.S. between January 2020 and April 2021. For states where a new governor was appointed during our study period (Montana, Rhode Island, and Utah), tweets posted during the governors' respective terms were included for both the old and current elected officials. Currently, only eight of the 50 governors of U.S. states are women, and three of these are Republican. All tweets were extracted using the official Twitter API. A total of 122,450 tweets were posted by the governors during our study period. Our analysis included COVID-19 related tweets, which were identified as posts that included specific keywords ("covid", "ncov", "pandemic", "sars", "corona", "the virus", "lockdown", "quarantine", and "outbreak") (N=37,709 tweets; 31% of all tweets).

Tweets were pre-processed prior to analysis. We removed emojis, hyperlinks, and other non-relevant text. Our analysis followed two stages: a) a lexicon-based analysis to identify the proportion of tweets related to our pre-defined COVID-19 themes, and b) a lexicon-based sentiment analysis to classify tweets as positive, negative, or neutral.

Lexicon-based analysis with pre-defined themes: A lexicon is a list of keywords that captures specific topics or themes, in the context of a specific collection of text. Based on prior research on crisis communication by leaders,^{7,8} we assessed the prevalence of ten COVID-19 related themes, including prevention, care, and social

Table 1: Topics and their related keywords

	Topics	Example Keywords
Thematic Content	COVID-19 practices	"social distance", "wash hands", "mask"
	COVID-19 surveillance	"covid-19 deaths", "dashboard", "covid-19 cases"
	COVID-19 and healthcare professionals	"nurse", "doctor", "medical professional"
	COVID-19 resources on information	"helpline", "briefing", "webinar", "town hall"
	COVID-19 vaccine	"vaccine", "the jab", "shots"
	COVID-19 and the economic impact	"economy", "employment"
	COVID-19 and gender	"gender-based violence", "women's sexual health"
	COVID-19 and secondary impacts	"mental health", "stigma", "education"
Emotions Attached to Content	Confronting COVID-19 with unity and solidarity (Collective efficacy)	"solidarity", "neighbor", "community"
	Empathy	"grateful", "sorry", "thank", "heart goes out"

and economic impacts. To identify keywords for the themes, we first drew from previous similar research on Twitter communication that examined specific keywords used by public health leaders to communicate about infectious diseases or outbreaks.⁸ Next, we used a lexical database, WordNet, to search for words related to each theme.⁹ We also qualitatively reviewed a random sample of 200 tweets related to COVID-19 to identify more keywords for each theme [Table 1].

Lexicon-based sentiment analysis: To assess the sentiments reflected by the tweets, we used a pre-defined large library of words classified as positive, negative, and neutral, from a Python library for Natural Language Processing called TextBlob.¹⁰ Based on the frequency of different words, a score of polarity is estimated for each text/tweet. Polarity scores range from -1 to +1, with scores greater than 0 signifying positive sentiment

and scores less than 0 representing negative sentiment. Neutral sentiment is represented by a polarity score of 0.

We ran chi-square tests to examine differences in percentage of tweets for each of the ten pre-defined themes and sentiments, by gender and political affiliation.

Results

Overall, 31% of all tweets posted by US governors were related to COVID-19 (N=37,709 COVID-19 related tweets). We found no significant differences by gender or political party in the proportion of tweets that were COVID-19 related. For women governors, we see a peak in proportion of tweets about COVID-19 around January 2021, when the number of new COVID-19 cases in the country was the highest, a finding not seen for men.

Figure 1: Percentage of daily tweets by governors that included keywords related to COVID-19, by gender. Figure also shows the daily number of new COVID-19 cases

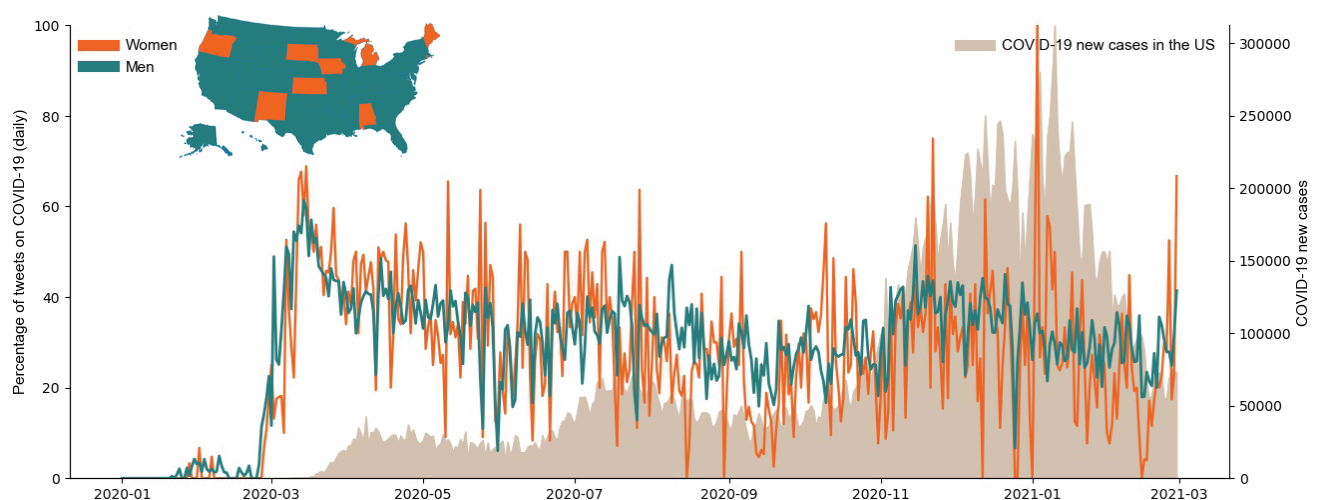
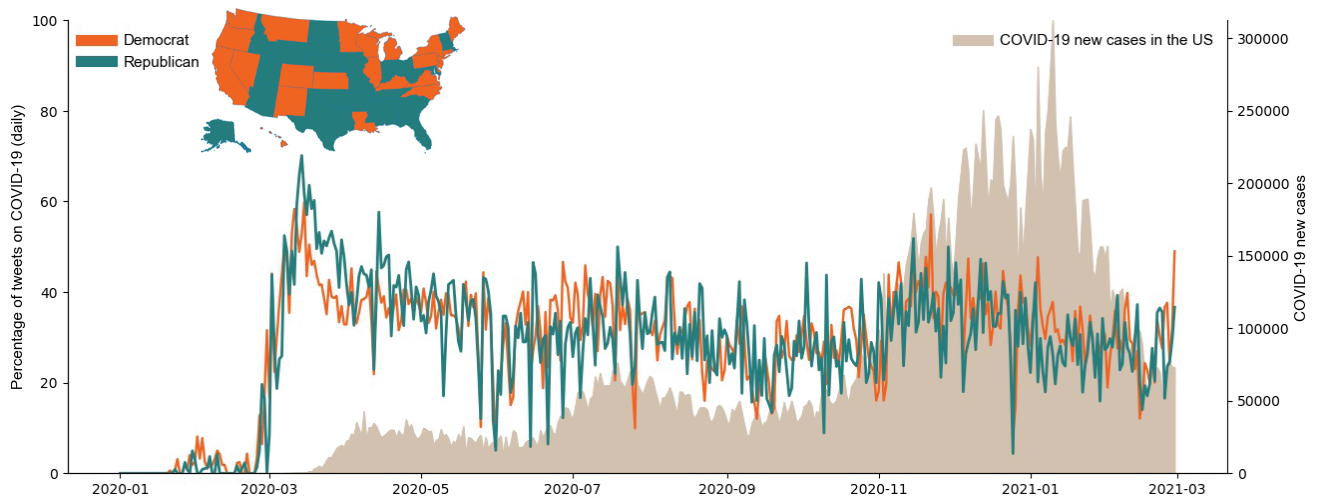


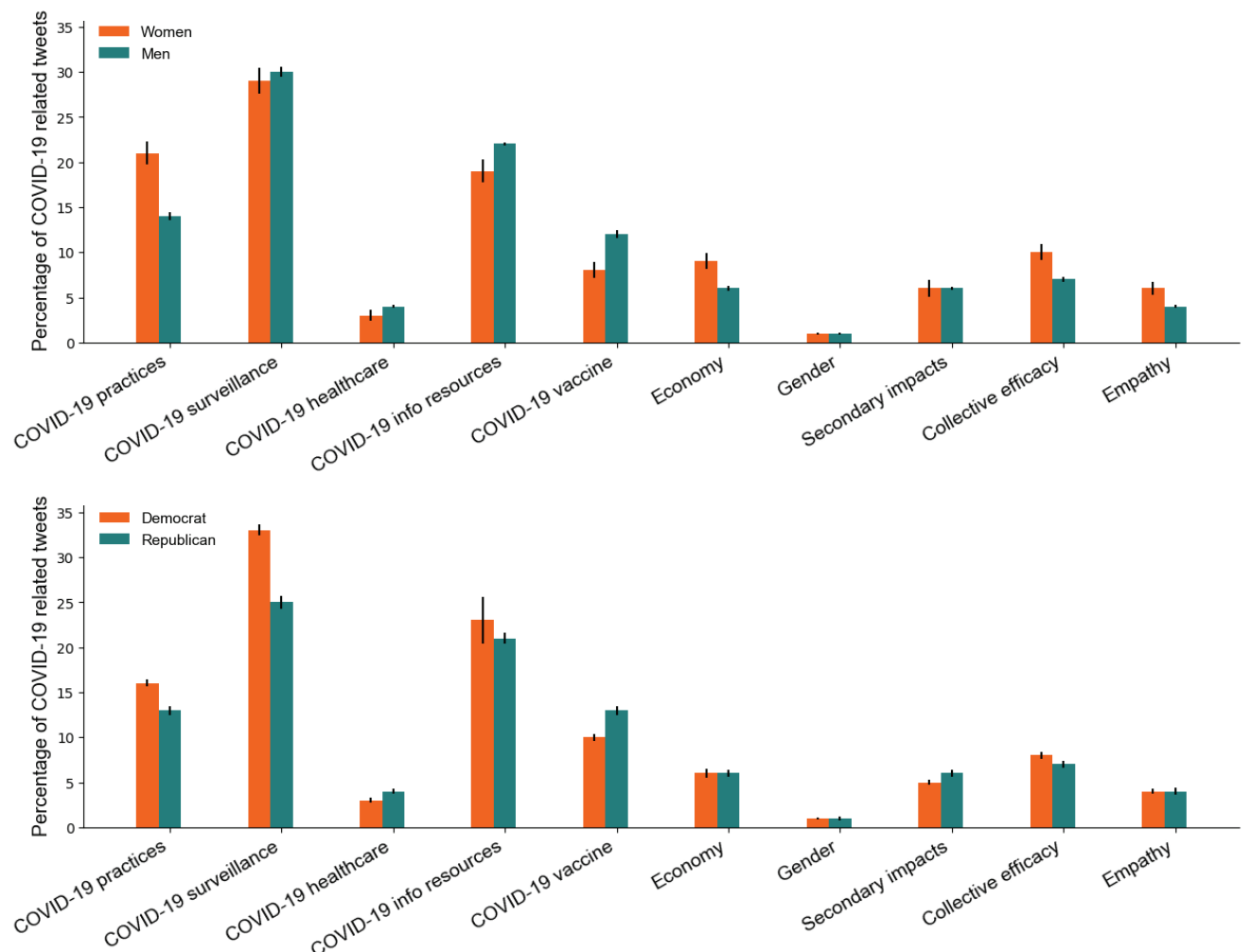
Figure 2: Percentage of daily tweets by governors that included keywords related to COVID-19, by political party. Figure also shows the daily number of new COVID-19 cases



Overall, 15% of the COVID-19 related tweets mentioned COVID-19 practices, with significant differences by gender as well as political party. Women and Democrats posted more about COVID-19 prevention and behavior and the value of collective responses. Women more than men posted about economic effects of the pandemic

and used empathetic language, whereas more men than women posted about the vaccine and information on COVID-19 resources. Democrats more than Republicans posted about COVID-19 surveillance, whereas Republicans more than Democrats posted about the COVID-19 vaccine and healthcare professionals [Figure 3].

Figure 3: Percentage of tweets for each theme, by gender and party affiliation (N=37,709)



Around 51% of the tweets related to COVID-19 captured positive sentiments, and 15% represented negative sentiments. Significant differences were observed by gender as well as political party in the prevalence of positive, negative, and neutral tweets. Tweets by women and Democrats were more likely to be classified as positive, relative to men and Republicans (60% vs 50% for women vs men, and 52% vs 50% for Democrat vs Republican). Men and Republicans posted significantly higher number of neutral tweets.

Discussion

Findings from this study examining Twitter messaging for U.S. governors found no differences in the proportion of tweeting focused on COVID-19 based on governor's gender or political party. However, we noted important differences in the content of Twitter messaging. Women compared to men were more likely to emphasize prevention, behavior change, and economic impacts of the pandemic, and to support messaging of collective efficacy and empathy in response to the pandemic. In contrast, men focused on the more instrumental aspects of vaccine and available informational resources (e.g., helplines). Further, the nature of the messaging tended to be more positive and hopeful among women governors and more neutral among men governors. Overall, these findings are consistent with prior research from outside the U.S., which has found stronger and more rapid focus on COVID-19 prevention efforts by women relative to men.⁵ We extend these findings with indications that women are more likely to focus on positive change, empathy for the affected and the importance of citizen unity, findings previously indicated in analysis of national leaders, as well.¹¹

Differences in twitter messages by political party also yielded significant findings, with Democrats more than Republicans focused on prevention, information, and the value of collective efficacy, and Republicans more than Democrats focusing on vaccine and health care and using neutral messaging. These findings somewhat align for women and Democrats and for men and Republicans, which may be due to the small number of women in our sample and women Republicans specifically. Nonetheless, the lack of perfect alignment in findings by gender and political party suggest that gender may have independent effects on messaging beyond that explained by party. Findings highlight that political party alone does not explain differential COVID-19 messaging. Gender contributes to this phenomenon as well, as has been noted by prior global research where women leaders focused more on social welfare efforts and secondary health care needs during COVID-19.¹² These findings highlight the importance of building gender diverse leadership in politics to help support a broader array of approaches to public health issues.

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