

2020 Democratic Primaries and the Media: Exploring Gender Bias in the Discourse Around Presidential Candidates

Marcelina Przespolewska, Toshali Sengupta, Coline Chavane

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I. INTRODUCTION

As the 2020 presidential election witnessed a record number of female candidates competing for the highest office in the U.S., major media organizations started publishing reports on the gendered narratives permeating the campaigns of some top contenders for the Democratic nomination. As they claimed, Elizabeth Warren was trapped by the question of electability (Bennett, 2020), Kamala Harris became the misogynists' favorite target (Smith, 2019), and Kirsten Gillibrand was simply too feminist for the country's taste (Lerer and Goldmacher, 2019; Lerer, 2019), which perhaps echoed the backlash the same organizations had received following their coverage of Hillary Rodham Clinton, the first female major-party nominee for President, only four years earlier (Stoehr, 2016).

This peculiarity surrounding female candidates and their political ambitions is something that Clinton (2017) herself noticed, insisting that competing for a job, unlike performing a job, leaves her with a "relentless barrage of political attacks and negative coverage" (pp. 399-400). And there exists some research evidencing such sentiment, showing that female political figures, such as first ladies, receive more negative media coverage when they actively engage in politics (Scharrer and Bissell, 2000). Clinton (2017) has further emphasized the disproportionate amount of press coverage her infamous email server controversy received throughout the election season, which accurately depicts the media's role in shaping the narrative around a female candidate like Clinton; as research shows, the New York Times, which endorsed Clinton for President, in less than a week, published as many stories about her emails as it did about her policies in more than two months before Election Day (Watts and Rothschild, 2017).

Considering the rather limited research scrutinizing gender bias in the media coverage of female candidates in the most recent presidential election, the wave of 2020 female Democrats running for President following Clinton's historic candidacy, and the lack of 2020 female Republican candidates, this study aims to explore the media coverage of top female contenders for the 2020 Democratic nomination. Ultimately, we chose to limit our research to the New York Times coverage of the newspaper's endorsees that cycle, Elizabeth Warren and Amy Klobuchar, as well as their highest-polling male competitors, Joe Biden and Bernie Sanders, in order to explore gender bias in the media discourse around female presidential candidates following the highly scrutinized 2016 coverage of Clinton by the Times. As such, our first research question is as follows:

RQ1: How did the New York Times coverage of female candidates differ from the coverage of male candidates during 2020 Democratic presidential primaries?

Further, and considering the unprecedented role that Twitter, as a social media network, played in the 2016 presidential election (Galdieri, 2018), we supplement our research by exploring the

differences in the narratives around female candidates between the legacy media, such as the New York Times, and the new media, such as Twitter. We thus ask the following second research question:

RQ2: To what extent did the discourse on Twitter regarding female and male candidates on key dates during the 2020 Democratic primaries reflect the New York Times coverage throughout the primary period?

Ultimately, it is our aim to contribute to the existing literature on gender dynamics in the media discourse around female presidential candidates.

II. LITERATURE REVIEW

Existing research shows that female political candidates, on average, receive less media attention than their male competitors (Kahn and Goldenberg, 1991; Kahn, 1994; Van der Pas and Aaldering, 2020). Kahn's (1994) influential work on media coverage of female candidates further indicates that women tend to generate more negative coverage and less issue coverage, and that the media attention given to personal characteristics is more common for female than male candidates. Some of the more recent studies show similar patterns; for instance, Dunaway et al. (2013) find that political races with female candidates tend to receive more coverage focused on personality traits and less coverage centered on issues when compared to all-male races. However, there exists some research indicating that the coverage of female candidates is not always more negative (Bystrom et al. 2001, as cited in Atkeson and Krebs, 2008, p. 240), and that, for more local campaigns, political races with female candidates bring a wider range of issue coverage and the media attention is more favorable to the perceived strengths of women (Atkeson and Krebs, 2008). Still, drawing upon Meeks (2012), Ryan (2013) emphasizes that media coverage, in fact, "changes as women move higher on the political ladder because of [the] increase in the unconventionality of their candidacy," and said coverage then becomes "increasingly negative" (p. 18).

This pattern has been evidenced in studies focusing on female candidates for President, such as Elizabeth Dole, a 2000 candidate for the Republican nomination, and Hillary Rodham Clinton, a 2008 candidate for the Democratic nomination and subsequent 2016 Democratic nominee. Heldman et al. (2005), for example, finds that Dole did not receive the amount of media attention that would reflect her high standing in the polls, and that news outlets paid more attention to Dole's personality traits than other candidates' traits. Carlin and Winfrey (2009) suggest that, in 2008, Clinton received a substantial amount of negative coverage, and Uscinski and Goren (2011) show that the press referred to Clinton more informally during the same cycle than her male counterparts.

Our study is largely influenced and inspired by the extensive research conducted at Harvard Kennedy School's Shorenstein Center on Media, Politics, and Public Policy on the media coverage of the 2016 presidential election, or the first presidential race where a female candidate won the nomination of a major party. In one of his reports, Patterson (2016a) finds that, from the early days of the primary season until Election Day, Clinton's overall coverage was more negative than

the coverage of the Republican nominee, Donald Trump, which is consistent with existing research (see Kahn, 1994; Heldman et al., 2005; Uscinski and Goren, 2011). The study further shows that Clinton's leadership, experience, and policy stands collectively made up 11% of her coverage, compared to 16% of Trump's coverage; further, Clinton's controversies and personality traits made up 23% of her coverage, while Trump's controversies and traits made up 19%, which, again, is consistent with existing literature indicating that women's coverage, or coverage of races with women candidates, is less issue-focused (see Kahn, 1994; Dunaway, 2013).

Interestingly, and within the same research series, Patterson (2016b) finds that Clinton, as the presumptive nominee for the 2016 Democratic nomination from day one, received substantially more coverage during the *primaries* than her main competitor, far-left Vermont Senator Bernie Sanders. But he also shows that Sanders' coverage, at the end, was considerably more positive than Clinton's (Patterson, 2016b). In fact, in 2015 alone, Sanders received *positive* coverage in nearly every month, and the tone of his coverage peaked at 60% positive in September of that year (Patterson, 2016b). Clinton, on the other hand, received *negative* coverage in every single month except for one, when the tone of her coverage peaked at only 4% positive in October (Patterson, 2016b).

The existing literature on the 2020 presidential primaries relating to gender bias in the media remains largely limited, although Cassese et al. (2021) show that the 2020 female candidates faced difficulties in the form of gendered coverage and Gibbons (2022) finds that the media created new stereotypes for women candidates, which, to some extent, mirrors past research.

Our study extends this line of research on gender bias in the coverage of 2020 presidential candidates, and all presidential candidates in general, by supplementing the examination of newspaper coverage with the analysis of the discourse present on new media platforms, such as Twitter. There exists some research exploring the gender dynamics on Twitter during presidential election cycles, such as Weaving et al.'s (2023) study showing that the level of misogyny towards Clinton increased while she was actively running for President in 2016, or King and Carley's (2023) paper indicating that Warren and Klobuchar faced more sexist language on Twitter than other candidates in 2020. Our study, however, contributes to the existing literature by exploring the differences in related narrative between the legacy media and the new media, which we discuss in the next section.

III. METHODOLOGY

As mentioned in our introduction, we had selected four candidates for our study: **Elizabeth Warren, Amy Klobuchar, Joe Biden, and Bernie Sanders**. We restricted our research to two female and two male candidates in order to facilitate the manipulation of data and the comparison of treatment between them depending on gender.¹ Warren and Klobuchar were selected since they were, similarly to Clinton, endorsed for the presidency by the New York Times, and Biden and Sanders were selected as the two top polling male candidates, similarly to Sanders in 2016 (e.g. Shepard, 2020).

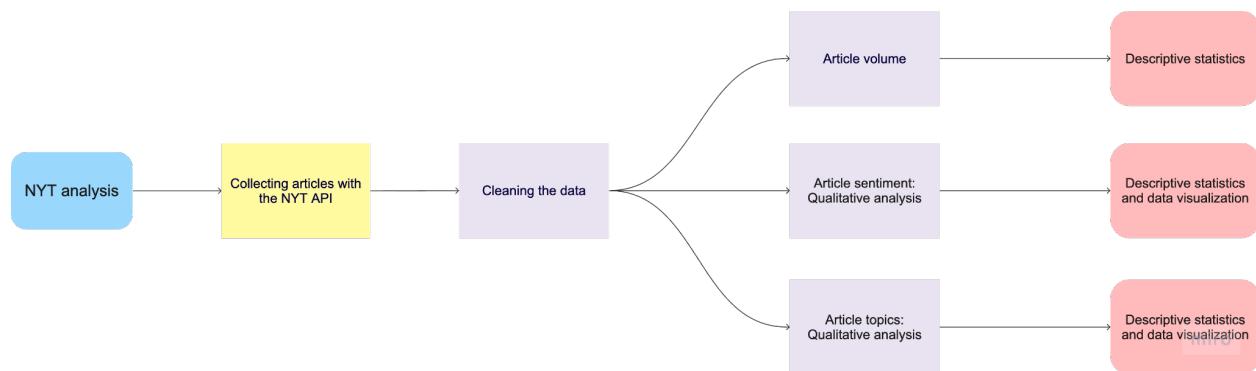
¹ Solely for the purpose of this study, we utilize the notion of gender as a binary concept.

Further, all four candidates were actively running for President throughout the entire time interval we chose for our study, which ranges from **January 1, 2020** (the day that unofficially marks the full-swing primary season in electoral politics, or approximately one month before the first caucus in the nation) to **March 5, 2020** (the day that the last female candidate, Warren, dropped out of the race, other than Tulsi Gabbard whose campaign never gained enough traction to remain competitive and whose polling was rather negligent). We chose this particular time period as it allows us to take a glance at the narrative surrounding the candidates around key primary dates, such as the Iowa caucus and the New Hampshire and South Carolina primaries, before all female candidates dropped out. We further divided our analysis into two parts: the New York Times analysis, to answer our first research question, and Twitter analysis, to answer our second research question.

A. THE NEW YORK TIMES

The New York Times analysis was conducted over the entire time interval ranging from January 1, 2020, to March 5, 2020.

Figure 1. The New York Times: Methodology



As presented on Figure 1. above, the following methodology was used:

- **Collecting data:** In order to collect data, we utilized the New York Times Article Search API to gather headlines, bylines, lead paragraphs, and publishing dates for all articles that mentioned the candidate's last name in the headline during the specified time period. We collected data for each of the four candidates separately.
- **Cleaning data:** We manually cleaned all four datasets, removing unrelated articles that were inadvertently pulled through the New York Times Article Search API (e.g. we removed articles referring to Warren Buffet from the Elizabeth Warren dataset). We ultimately ended up with 408 articles for all the candidates combined.
- **Analyzing data:** We generated descriptive statistics to measure the difference in article volume between female and male candidates. We then conducted qualitative analysis on the collected data to evaluate the sentiment of press coverage and to identify topics associated with each candidate.

Taking into consideration the headline, byline, lead paragraph, and publishing date of each article and qualitatively assessing the collective sentiment of these elements towards the candidate *in the electoral context*, we assigned each article with the value of [-1] if the sentiment towards the candidate was negative, [0] if the sentiment towards the candidate was neutral, and [1] if the sentiment towards the candidate was positive. For instance, an article using neutral language to describe the candidate but elevating their position to the frontrunner status despite depressing primary results would receive the classification of [1].

We then identified the topics that each article focuses on in order to further investigate the differences in coverage between female and male candidates. For each article, we selected one topic that we believed was the article's main focus. After assigning the articles to a wide range of topics (e.g. policy, health, scandal, etc.), we combined related topic categories and ultimately created three topic classifications:

- **Election/Horse Race:** The category covering topics related to election schedule, election events, polling numbers, newspaper endorsements, etc.
- **Policy/Background:** The category covering topics related to the candidate's policy stances, legislative voting history, etc.
- **Scandals/Personality Traits/Health:** The category covering topics related to the candidate's controversies, scandals, personal characteristics, physical appearance, health issues, etc.

Considering the existing research indicating that female political candidates receive less coverage, more negative coverage, and less-policy focused coverage (see, for example, Khan, 1994; Carlin and Winfrey, 2009; Heldman et al., 2005), we hypothesized as follows:

H1: Female candidates received less NYT coverage than male candidates during the 2020 Democratic presidential primaries.

H2: The NYT coverage was more negative towards female candidates than male candidates during the 2020 Democratic presidential primaries.

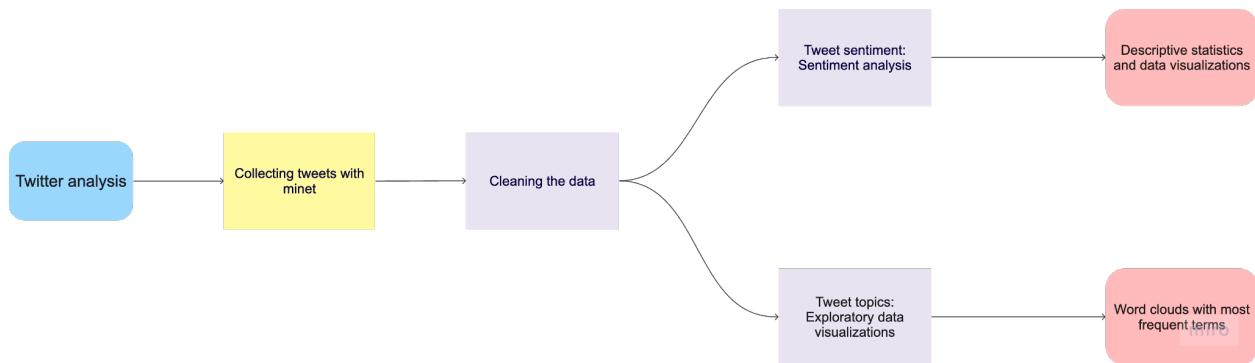
H3: The NYT coverage was less policy-focused for female candidates than male candidates during the 2020 Democratic presidential primaries.

B. TWITTER

The Twitter analysis was conducted exclusively for three one-day events within the time period chosen: **the Iowa caucus** (February 3, 2020), **the New Hampshire primary** (February 11, 2020), **and the South Carolina primary** (February 29, 2020). This was done in order to explore and compare the online discourse between all four candidates in the context of the candidates' electoral performance during each event, which varied greatly between different primary dates (e.g. Biden's performance in New Hampshire vs. South Carolina).

We selected the Iowa caucus and the New Hampshire primary since the two constitute the first caucus and the first primary in the electoral calendar, respectively, and the South Carolina primary due to 1) the state's greater resemblance to the Democratic electorate in relation to racial and ethnic composition and 2) its role in reviving the ultimate party nominee's campaign. We again used the same four candidates in order to replicate the New York Times analysis.

Figure 2. Twitter: Methodology



As depicted on Figure 2. above, the following methodology was used:

- **Collecting data:** Tweets were scraped using the *minet* Python library separately for each date and each candidate. We scraped all tweets from the above-mentioned three key dates that included both the first name and last name of the candidate. (For Twitter, we chose to use the full name in order to avoid pulling unrelated tweets; for the New York Times, however, it made more sense to use only the last name given the smaller dataset where unrelated articles could be manually removed and where the headlines often refer to candidates by last name only).
- **Cleaning data:** For each candidate, the data was cleaned to remove tweets that mentioned the incumbent Republican President, Donald Trump, as well as *any* other candidate that, *at any point* during the election cycle, was running as a 2020 Democratic candidate for President. This was done to prevent any confusing sentiment results in case a user expressed multiple sentiments for different candidates in the same tweet. For all candidates and dates combined, we ended up with 169,568 tweets.
- **Analyzing data:** We employed sentiment analysis to evaluate and compare the sentiment towards each candidate on Twitter and created word cloud data visualizations to explore what words were most often used in tweets mentioning the candidates. We believed that determining the most frequently used words in relation to each candidate would allow us to identify topics associated with candidates.
 - **Sentiment analysis:** To produce descriptive statistics and data visualizations on the sentiment, we used the *TextBlob* Python library on the cleaned Twitter data for each candidate for the three events, which allowed us to generate polarity/subjectivity means and plots.

- **Word clouds:** To generate data visualizations with most frequently used words, we utilized the *wordcloud* Python library, using the previously cleaned Twitter data for each candidate for the three events. Commonly used words (such as “and”) were removed from the dataset to produce clearer word clouds.

Considering the existing research that shows the more sexist Twitter discourse around female presidential candidates when they are running for office (see Weaving et al. 2023; King and Carley, 2023), we hypothesized as follows:

H4: The discourse on Twitter reflected more negative sentiment and less-policy focused rhetoric for female candidates than male candidates on key dates during the 2020 Democratic primaries.

IV. RESULTS AND DISCUSSION

A. THE NEW YORK TIMES

We first calculated the number of articles by candidate throughout the previously specified time period in order to compare the volume of the New York Times coverage between female and male candidates. The results are presented below in Table 1.

Table 1. The New York Times: Number and Proportion of Articles, by Candidate

Candidate	Articles Total	Percentage
Biden	117	29%
Klobuchar	35	9%
Sanders	173	42%
Warren	78	19%

Note: Percentages were rounded up and might not add up.

As the results above indicate, the male candidates, Biden and Sanders, received the overwhelming majority of the four-candidate New York Times coverage during said period (around 70%), with Sanders alone receiving nearly half of coverage, which is in stark contrast to the 2016 primaries where Patterson (2016b) found that Clinton received most of the overall coverage. Warren and Klobuchar, who were endorsed by the New York Times for President before the Iowa caucus, received only 19% and 9% of said coverage, respectively.

Table 2. and Figure 3. below show results of our qualitative analysis of sentiment towards the candidates in the New York Times coverage, also within the previously specified time period.

Table 2. The New York Times: Article Sentiment Mean, by Candidate

Candidate	Sentiment Mean
Biden	0.39
Klobuchar	0.09
Sanders	-0.10
Warren	0.06

Table 2. presents the mean sentiment for each candidate, which can range from [-1] as the most negative to [1] as the most positive. As the results indicate, Biden received the most positive coverage (with the mean of [0.39]), while Sanders received the most negative coverage of all candidates (with the mean of [-0.10], which was actually quite close to the neutral classification of [0]). The sentiment towards Klobuchar and Warren was quite neutral, and it was also similar between the two candidates (with the mean of [0.09] for Klobuchar and the mean of [0.06] for Warren). As such, the female candidates did not receive an overwhelmingly negative coverage relative to male candidates. The results, however, are particularly interesting for Biden, who had quite positive coverage while having performed poorly in the electoral contexts up until the South Carolina primary, which was near the end of our specified time period.

Figure 3. The New York Times: Article Sentiment towards 2020 Democratic Candidates

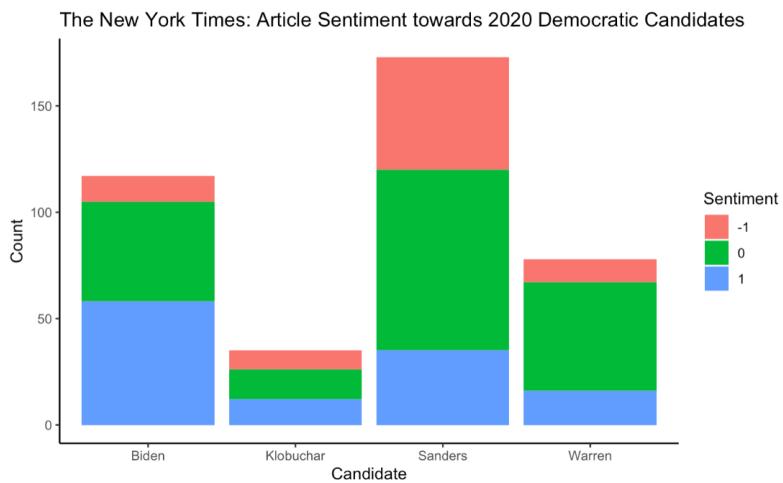


Figure 3. shows the sentiment results divided by sentiment classification. The data visualization indicates that, interestingly, neutral articles made up a substantial amount of Warren's coverage, while the number of negative, neutral, and positive articles was more equal for Klobuchar. As such, no particular gender-based patterns emerge.

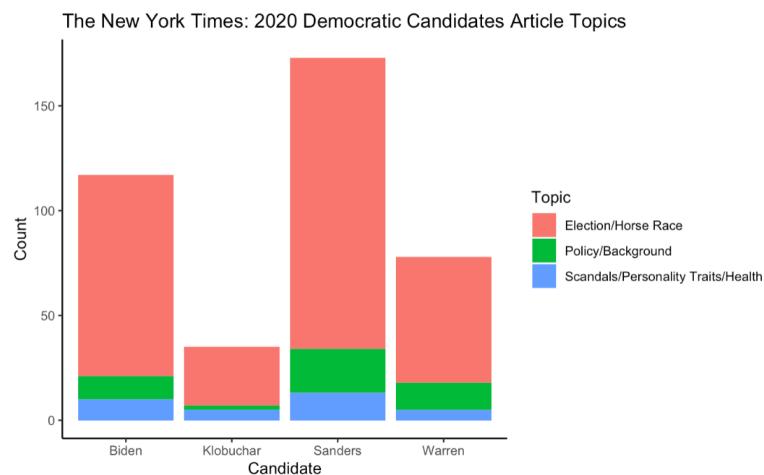
Table 3. and Figure 4. present the results of our qualitative analysis on topics related to candidates in their New York Times coverage, similarly within the same time period.

Table 3. The New York Times: Article Topics, by Candidate

Topic	Biden	Klobuchar	Sanders	Warren
Election/Horse Race	82%	80%	80%	77%
Policy/Background	9%	6%	12%	17%
Scandals/Personality Traits/Health	9%	14%	8%	6%

As Table 3. above indicates, the percentage of policy/background coverage was the highest for Warren among all four candidates. The same percentage was, however, the lowest for Klobuchar. Further, the percentage of scandals/personality traits/health was the highest for Klobuchar, while it was also the lowest for Warren. Given these results, we are unable to find any gender-based patterns relating to topics in the New York Times coverage. Interestingly, however, we can observe that Sanders and Warren, as the more progressive candidates, received more coverage related to their policy/background, while Biden and Klobuchar, the more moderate candidates, received more coverage related to their scandals/personality traits/health. Figure 4. below further depicts the same distribution of topics.

Figure 4. The New York Times: 2020 Democratic Candidates Article Topics



Overall, the New York Times analysis results indicate that Warren and Klobuchar, as female candidates, received substantially less coverage during the specified primary period, yet we didn't find enough evidence to suggest that their press coverage was more negative. Further, we could not find a clear pattern indicating a less-policy focused coverage for female candidates; while Klobuchar's coverage seems to be aligned with our assumption that a female candidate would receive less policy-focused media attention than her male counterparts, the opposite appears to be true for Warren.

As such, there is strong evidence to support our first hypothesis stating that female candidates received less NYT coverage than male candidates during the 2020 Democratic presidential primaries. However, there is no evidence to support our second hypothesis stating that the NYT coverage was more negative towards female candidates than male candidates during the same primaries. And finally, there is not enough evidence to fully support our third hypothesis stating that the NYT coverage was less policy-focused for female candidates than male candidates during the said primary season.

Our results, then, largely diverge from the existing scholarship on gender bias in the coverage of female political candidates. While our findings are consistent with the literature on coverage volume (see, for example, Khan, 1994), they differ in relation to positive/negative sentiment and topic of coverage (see, for example, Carlin and Winfrey, 2009; Heldman et al., 2005). More interestingly, the results of our analysis seem to be the opposite of Patterson's (2016b) findings on the 2016 primary contest between Clinton and Sanders, where Clinton, as a female candidate, received more media attention, yet, during the primaries, Sanders was "the most favorably reported candidate" (p. 12). It is important to note, however, that these studies usually involve a wider range of newspapers, while our analysis focuses exclusively on the New York Times.

B. TWITTER

For Twitter, we first visualized the sentiment towards each candidate, separately for every caucus/primary, using scatter plots with the polarity and the subjectivity of tweets, as presented on Figures 5-7. below.

Figure 5. Twitter: Polarity/Subjectivity of Tweets – Iowa, by Candidate

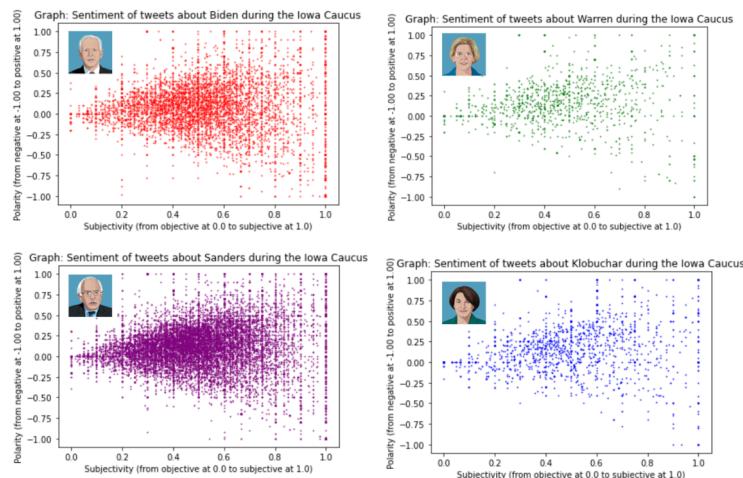


Figure 6. Twitter: Polarity/Subjectivity of Tweets – New Hampshire, by Candidate

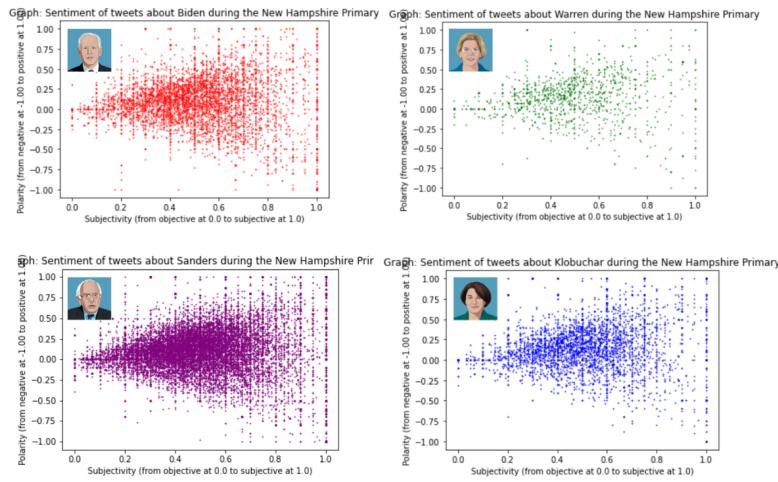
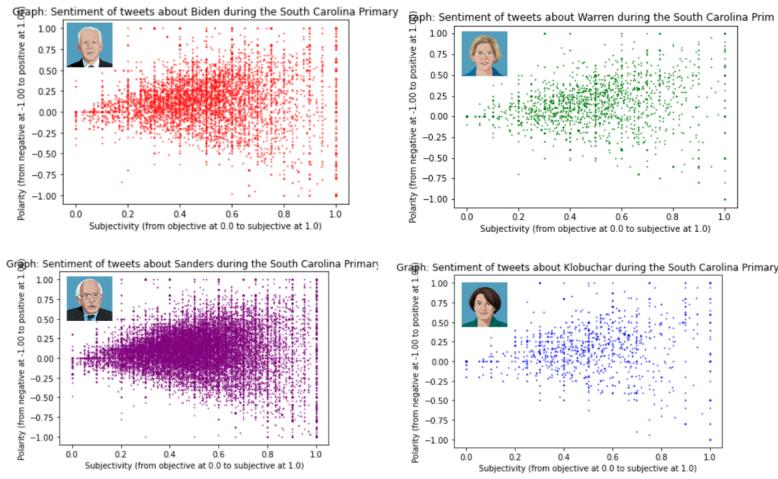


Figure 7. Twitter: Polarity/Subjectivity of Tweets – South Carolina, by Candidate



These graphs indicate that the male candidates had a greater volume of tweets during each caucus/primary day, as we can observe the higher density of tweets on the scatter plots for these two candidates than for female candidates. However, it is also important to note that Klobuchar appears to have had a higher volume of tweets during the New Hampshire primary than she did during the remaining two one-day events, which could be related to her surprising performance during said election, where she outperformed both Biden and Warren (Corasaniti, 2020). On all scatter plots, we can further observe that lower subjectivity (ranging from objective [0] to subjective [1]) is associated with more neutral tweet sentiment due to the increased concentration of tweets near the polarity of [0]. Moreover, we can observe that, for female candidates, the density appears to be slightly higher for tweets with positive polarity (polarity ranges from negative sentiment [-1] to positive sentiment [1]), unlike for male candidates. This would suggest that the discourse around female candidates on key dates was more positive than for male

candidates. On an additional note, it appears that sentiments for all candidates ranged from [-1] to [1], which is reflective of Twitter users' broad range of viewpoints.

To determine whether the discourse around female candidates was more positive as suggested by the plots above, we calculated the polarity means for each candidate, along with subjectivity means.

Table 4. Twitter: Polarity and Subjectivity Means of Tweets – All Elections, by Candidate

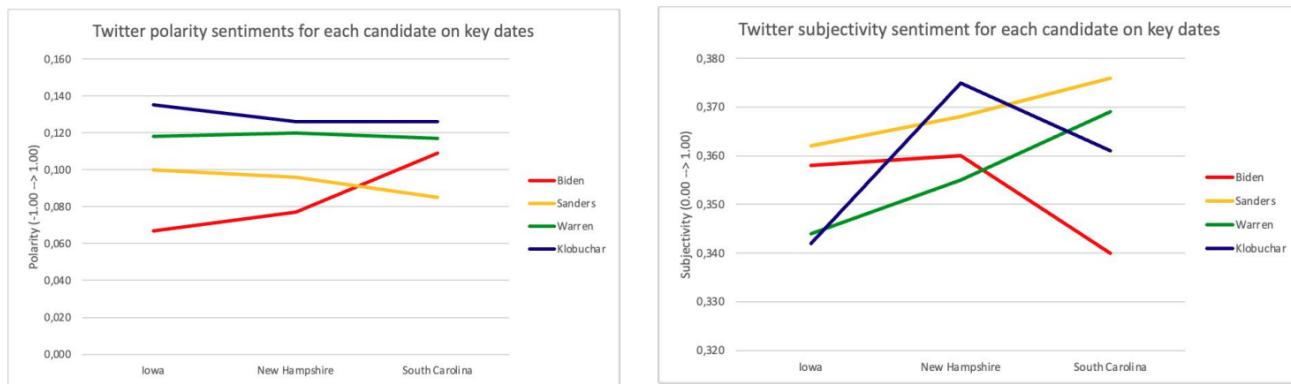
	Iowa	Iowa	New Hampshire	New Hampshire	South Carolina	South Carolina
Candidate	Polarity Mean	Subjectivity Mean	Polarity Mean	Subjectivity Mean	Polarity Mean	Subjectivity Mean
Biden	0.067	0.358	0.077	0.360	0.109	0.340
Klobuchar	0.135	0.342	0.126	0.375	0.126	0.361
Sanders	0.100	0.362	0.096	0.368	0.085	0.376
Warren	0.118	0.344	0.120	0.355	0.117	0.369

As Table 4. above indicates, the polarity mean is higher for female candidates than for male candidates during each electoral contest, suggesting that the sentiment on Twitter towards female candidates was more positive. In relation to individual candidates, Klobuchar consistently had the highest mean polarity among all candidates on the three days, and Warren's mean polarity did not show big changes.

Moreover, the subjectivity means for all candidates and all dates are rather similar, with the objectivity ranging from [0.340] to [0.376], indicating that most of the tweets, across candidates, did not vary much in terms of subjectivity. Surprisingly, however, the means are closer to the objective end of the scale than the subjective end, which is the opposite of what one might expect of Twitter. Still, with such a small range, it is hard to draw conclusions about specific candidates in relation to subjectivity.

Figure 8. below depicts how the polarity and subjectivity of tweets changed over the three events for each candidate more clearly.

Figure 8. Twitter: Polarity and Subjectivity of Tweets Over Time, by Candidate



The polarity graph (left-hand side) depicted on Figure 8. above further suggests that Warren and Klobuchar received more positive sentiment on Twitter throughout the entire period. What is particularly interesting, however, is how the polarity for each day is related to a candidate's electoral performance.

For Biden, who won nearly half of all the votes in the South Carolina primary after coming in fourth and fifth in Iowa and New Hampshire, respectively, the sentiment became substantially more positive during the South Carolina primary. For Sanders, whose chances of winning key Super Tuesday states and the nomination decreased after Biden won South Carolina, the polarity was the lowest during that state's primary election. In other words, Sanders' mean polarity decreased over time, and Biden's mean polarity increased over time, which is reflective of their election performance in the primary season. For Klobuchar as a female candidate, on the other hand, the sentiment decreased during her surprisingly high performance in the New Hampshire primary.

While the complexity of multiple races and various performances make it difficult to find clear patterns, especially when they are not fully consistent, at least *some* trends emerge in relation to the candidates' electoral performance and the Twitter sentiment towards them. Indeed, these trends seem to suggest that female candidates' success *potentially could be* associated with more negative sentiment, while male candidates' success *potentially could be* associated with more positive sentiment—or that the discourse could become more subjective amid female candidates' success and less objective amid male candidates' success (e.g. Biden in South Carolina and Klobuchar in New Hampshire, considering the drastic changes in both their performance and subjectivity, as opposed to Sanders' and Warren's). These potential trends could be perhaps linked to Weaving et al.'s (2023) study suggesting that Twitter sentiment towards Clinton became more sexist when she was actively campaigning for President. However, determining whether such trends do, in fact, exist is beyond the scope of our research.

Finally, Figures 9-11. below contain word clouds with most frequently recurring phrases or words on Twitter in relation to each candidate during every caucus or primary election, which we use to identify topics related to each candidate.

Figure 9. Twitter: Word Clouds – Iowa, by Candidate



Figure 10. Twitter: Word Clouds – New Hampshire, by Candidate



Figure 11. Twitter: Word Clouds – South Carolina, by Candidate



In line with our fourth hypothesis, we were expecting that word clouds based on tweets mentioning female candidates would include phrases or words with embedded gender biases, such as words referring to women's personal appearance or scandals, while word clouds based on tweets mentioning male candidates would contain words focusing on policy issues.

After analyzing word clouds depicted on Figures 9-11. above, however, we did not observe strong gender bias. Indeed, for female candidates, most frequently used words included, for instance, “President,” “vote,” “campaign,” etc. Further, for women in particular, we found frequently used words associated with policy ideas, such as “plan,” “abortion,” “gas investments,” etc. (“Children” is also a frequently used word for Warren; however, this could relate to either the gender bias where the word is simply associated with women *or* children-focused policy/political speeches where a candidate refers to children’s future). Interestingly, for Biden as a male candidate, the word clouds reflect controversial topics that emerged during the campaign season. For instance, the word “Ukraine,” “Hunter,” and “son” likely refer to a scandal involving Biden’s son Hunter Biden, Donald Trump, and Ukraine’s President. As such, the conclusion we can draw after doing the word clouds analysis is that no clear gender biases emerge in relation to topics during the key dates of the primaries (and the results actually appear to be more indicative of women having been discussed in the context of their policies rather than controversies).

Overall, the Twitter analysis results indicate that male candidates had a greater tweet volume than their female counterparts in all three elections, which resembles the results of our New York Times analysis. In contradiction to existing literature on the positive/negative sentiment in legacy media coverage as well as on the sexist language in Twitter discourse (see Carlin and Winfrey, 2009; King and Carley, 2023), however, the most positive sentiment was directed at Klobuchar, followed by Warren, which suggests that the discourse on Twitter was more positive around female candidates than around male candidates. Further, we were unable to find any patterns indicating that the narrative surrounding female candidates was less-policy focused. As such,

there is no evidence to support our fourth hypothesis stating that the discourse on Twitter reflected more negative sentiment and less-policy focused rhetoric for female candidates than male candidates on key dates during the 2020 Democratic primaries. In that sense, the discourse on Twitter is largely reflective of our New York Times analysis, where, again, we found less overall coverage for female candidates but could not see enough evidence suggesting that said coverage was more negative or less-policy focused.

V. CONCLUSION AND LIMITATIONS

Our research shows that the representation of female and male candidates in the New York Times coverage during the 2020 Democratic primaries was not as biased in relation to gender as the existing literature and our hypotheses indicated. Our analysis did not provide evidence that women tend to receive more negative media attention and less policy-related coverage. It also did not align with Kahn's (1994) seminal work indicating that media attention given to personal characteristics is more common for female than male candidates.

Our Twitter analysis similarly did not show that the discourse around female candidates was more negative than the discourse around male candidates, which counters our expectation as well. Indeed, Klobuchar had the highest mean polarity across all three caucus/primary dates, closely followed by Warren, which, again, contradicts the existing literature (see Carlin and Winfrey, 2009; King and Carley, 2023). We further did not find any evidence suggesting that female candidates on Twitter were less likely to be associated with policy issues than male candidates.

However, we did find that male candidates received more attention from both the traditional media and the social media platform, which is consistent with past research (see Kahn and Goldenberg, 1991; Kahn, 1994; Van der Pas and Aaldering, 2020). In that sense, our analysis seems to show the opposite of what Patterson (2016b) found in relation to the 2016 Democratic primaries, whose study largely inspired ours.

Interestingly, we did find additional insights in relation to Twitter sentiment and electoral performance, even though such insights fall beyond the scope of our original research questions. More specifically, we observed *some* gender-based patterns, *potentially* indicating that female candidates are viewed more negatively by Twitter users when they perform well in elections; however, we are unable to draw any related conclusions based on our limited study.

Ultimately, our study does not only contribute to the existing literature on the legacy media coverage of female political candidates and the new media discourse around said candidates, but it also provides valuable insights in the broader context of electoral politics. For example, one could argue that our study suggests that, following the candidacy of the first female nominee for President, the historically gendered narrative surrounding female presidential candidates could be changing—but it could also be argued that the New York Times narrative changed following its relentless coverage of Clinton's emails.

Considering the previously described insights we found in relation to Twitter sentiment and electoral performance, we believe that future research could focus on exploring the link between

the sentiment towards female presidential candidates and their electoral results, and likewise, our research could be further expanded in that direction.

Our study also has numerous limitations related to both the methodology and the data we utilized. In relation to methodology, several limitations arise:

- **Number of candidates:** We focused only on four candidates: two female and two male candidates. Although these four candidates were selected to ensure we had a manageable amount of data to analyze, the number was too limited to find clear gender-based patterns. The limited sample is particularly important when one considers the candidates' varying levels of popularity who were thus discussed in different manners, particularly on Twitter. For example, Sanders has a specific cult of personality on Twitter that may have impacted our results; as such, it is difficult to pinpoint any patterns with relation to his gender. To take this research further, the study could be expanded to include more candidates to draw out stronger patterns.
- **Timeline:** We focused our research on a limited timeline; a longer time interval could perhaps help paint a bigger picture, similar to previous studies. This is a particularly important aspect for election campaigns, as the discourse around candidates can significantly change in response to individual events.
- **Study limited to NYT:** We chose to focus only on the left-leaning NYT as it aligned with our focus on Democratic candidates, and particularly female Democratic candidates endorsed by said newspaper. However, this posed a limitation as it did not allow us to draw conclusions about traditional media representation in a broader sense, as it has been done by other researchers in the field. Our research is thus limited as it considers only one newspaper, with a specific political leaning, as a reference point for traditional media.
- **Lack of cross-validation:** The analysis conducted on the NYT articles to extract topics was done qualitatively. However, there was no cross-validation conducted and the analysis was subjective. To take this project further, it would be worthwhile to cross-validate the results, check for precision, and then draw conclusions.
- **Twitter sentiment analysis:** We did not train a model to conduct the sentiment analysis. This could have impacted our results since the language on Twitter, especially regarding political discourse, can be particular. Moreover, we lacked a deeper understanding of what the negative and positive polarities meant, and if they were categorized correctly. For example, a tweet may be categorized as “negative” for having a slur or a swear word, but it is possible that the words are being used positively in the tweet. This nuance is not captured by this sentiment analysis.
- **Word clouds:** We excluded some words while generating word clouds to focus on key topics and remove commonly used words, such as “and.” The limit of this technique is that we were only focusing on words and short phrases and not on expressions, and that we lacked context (e.g. “Ukraine”). Further, other words that we removed could have influenced the structure of our word clouds and thus our analysis. For example, we decided to remove the names of other candidates in order to focus on, for instance, policy-related or scandal-related terms associated with each candidate, which prevented us from understanding certain interactions in relation to different candidates. Further, and more

broadly, utilizing this technique prevented us from seeing relations between different words, which constitutes yet another limitation.

In relation to the data, we identified the following limitations:

- **The New York Times:**

- **Non-standardized number of articles:** The fact that we extracted differing numbers of articles for each candidate allowed us to respond to our first hypothesis. However, it also posed a limitation; for Klobuchar, for instance, the number of articles was particularly small, which could have potentially affected the validity of our study.
- **Limited overall number of articles:** Within our time range, we were not able to pull a more extensive number of articles, which could have potentially improved our study.

- **Twitter:**

- **Non-standardized number of tweets:** We extracted substantially different amounts of tweets for each candidate; again, such a limitation could have potentially affected the validity of the study.
- **Removed candidate interactions:** To make the number of tweets more manageable, we removed tweets where multiple candidates were mentioned. While this did give us insight into sentiment directed towards an individual candidate, it stopped us from being able to see how Twitter users may position candidates in relation to each other, which could be a path to explore for further research.
- **Sample unrepresentative of voting population:** The Twitter sample is solely representative of Twitter users and cannot speak for the wider voting population, which makes it difficult to draw any conclusions about the general sentiment of the wider electorate towards the candidates.

Based on the above-mentioned limitations, we believe that future research could further benefit from, for instance, utilizing a greater number of media organizations and data from an extended time interval in order to better replicate past research and contribute to the existing literature on broader media coverage of female candidates.

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