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The Emotional Power of Partisan Media: A Computer Vision Analysis of the 2020 Democratic Party Presidential Primaries

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ABSTRACT

Building on theories of emotional contagion and affective priming, the study assesses the emotional impact of the U.S. partisan media's coverage of six leading political candidates' images during the 2020 New Hampshire Democratic Party presidential primary. Results show that the partisan media's representations of the candidates' facial expressions of emotions are associated with the voters' feelings toward the politicians in their desired directions. Additionally, the partisan-media-primed emotions among the voters consistently align with their voting decisions. Methodologically, the study combines state-of-the-art computer vision techniques and survey research conducted with a representative sample of New Hampshire voters.

In modern political races, while sometimes a political candidate's friendly look can win the vote (Masch et al., 2021), other times they can be criticized for smiling too much (Zarya, 2016). At least two theories can help understand the association between political candidates' images portrayed in the news and voters' political attitudes and decisions. First, the emotional contagion theory suggests that emotions displayed by the sender will influence the emotions of recipients (Hatfield et al., 1993). Under specific conditions, however, counter-contagion can occur wherein positive emotions may trigger negative reactions and vice versa (e.g., Bucy & Bradley, 2004; Elfenbein, 2014). Second, affective priming further

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indicates that the aroused affective state will carry over, exerting an influence on cognitions and behaviors in an affect congruent way (e.g., Bower, 1981; Kühne et al., 2011). Taken together, it is logical to expect that the mediated candidate images will evoke emotional responses in voters, and those primed emotions will in turn shape their voting preferences.

Researchers have already applied the two theories to examine media representations of political candidates and what voters subsequently feel and decide. However, the existing scholarship is limited in several aspects. First, a discrepancy exists in how emotional contagion and affective priming are conceptually defined and empirically examined within the existing literature. Second, most research of this kind investigated emotional impact in a more or less artificial experimental setting (Gabriel & Masch, 2017), which could not necessarily reflect the actual media exposure in the rich media environment we face today. Third, while research reveals that today's partisan media are a powerful force (Guo et al., 2021) and produce visual biases in their portrayals of politicians (Peng, 2018), whether the visual coverage from partisan media exerts any emotional impact remains understudied.

This study empirically examines the emotional impact of the U.S. partisan media's visual coverage of six leading candidates in the 2020 Democratic Party presidential primaries: Joe Biden, Pete Buttigieg, Amy Klobuchar, Bernie Sanders, Elizabeth Warren, and Andrew Yang. Within the U.S. media landscape, conservative and liberal media outlets —aligned with the Republican and Democratic Parties, respectively— play a crucial role in shaping the national media agenda (Stroud, 2011). We conceptualize and examine the effect of these partisan media as a process, where emotions are first transmitted from the media to the public, subsequently shaping their decision-making. Methodologically, we employed state-of-the-art computer vision techniques to analyze a large-scale television video dataset to understand the portrayed candidate images, operationalized as facial expressions of emotions. Then, we paired the computer vision analysis results with a survey conducted with a representative sample of New Hampshire voters right after the state's primary to examine the media effect at the individual level. In U.S. presidential elections, partisan primaries are critical for aspiring presidential candidates to receive party nominations to get on the national ballots. The New Hampshire primary is the earliest, and perhaps the most influential, race. Often, the whole nation watches as the results of that initial primary may serve as a signal for the rest of the primaries (Palmer, 2018). In 2020, the Democratic Party presidential field boasted the most diverse slate of candidates in history. As many voters may not have seen the candidates before, this primary is ideal for

testing the influence of candidate images on voters' emotions and their subsequent decisions.

Facial expressions and emotional contagion

There is a wealth of evidence demonstrating that exposure to candidate faces can exert a significant influence on citizens' attitudes and behaviors (e.g., Bucy, 2000; Coleman & Wu, 2015; Gabriel & Masch, 2017; Masters & Sullivan, 1989; Wu & Coleman, 2014). The Dartmouth group in the United States conducted the initial series of experimental studies and revealed that when political leaders exhibited different facial emotions, it resulted in distinct physiological and emotional reactions among the viewers (e.g., Masters & Sullivan, 1989; Masters et al., 1986; McHugo et al., 1985). Todorov et al. (2005) showed that exposure to candidate faces as brief as one second could affect preferences. More recently, Masch et al. (2021) found a positive association between the candidates' display of happiness on campaign posters and vote share in Germany. While many facial attributes can generate emotional outcomes, this study focuses on political candidates' facial expressions of emotions because, compared with other visual signals, facial expressions have been found to play an essential role in shaping the public's impressions of politicians (Peng, 2018). Generally speaking, emotions are "responses to events that are important to the individual's goals, motives, or concerns" (Frijda, 1988, p. 351). Unlike feelings, emotions can be instinctively made or consciously disguised (Ekman, 2007). Considering our research context, while politicians often use impression-management strategies to control their facial expressions of emotions (Verser & Wicks, 2006), they can not necessarily control the media representation or the audience's perceptions and feelings about their expressions.

Several theoretical mechanisms can help explain the emotional impact of candidates' facial expressions. The emotional contagion theory suggests that emotions can be transferred from one individual to another (Hatfield et al., 1993). Specifically, recipients tend to mimic the emotions expressed by the sender, subsequently developing internal feeling states and attitudes toward the sender that align with the emotions they were exposed to, whether positive or negative (Hess & Blairy, 2001). This process can occur automatically or unconsciously, or it may involve cognitive components. In particular, exposure to facial stimuli may lead to counter-contagion, where positive emotions can trigger negative reactions and vice versa (e.g., Bucy & Bradley, 2004; Elfenbein, 2014). Elfenbein (2014) suggested that the decisive factor for contagion or counter-contagion lies in whether the sender and recipients share a vantage point. In political communication during campaign seasons, this means

the likelihood of a political candidate's facial expressions eliciting congruent emotions depends on whether the recipients share similar political attitudes with the politician. Scholars have also demonstrated that the context of communication, such as the appropriateness of the displayed emotions (Bucy & Bradley, 2004) and whether the interaction is competitive or collaborative (Lanzetta & Englis, 1989), affects the direction of emotional and evaluative responses.

Drawing upon emotional contagion and counter-contagion, we formed hypotheses that examine the degree to which a political candidate's facial expressions of emotions will trigger corresponding emotional responses. Adding to the existing literature, we posit that the media channel—partisan orientation in particular—through which politicians' images are presented acts as a contextual cue that could potentially influence emotional responses. In other words, the direction of the emotional effect is contingent not only on whether the individuals have a shared vantage point (Elfenbein, 2014) with the target politician, but also on whether the politician's political stance aligns with the specific media platform. In our research, we anticipate that exposure to a Democratic candidate's face in a liberal media outlet would result in emotional contagion, while exposure to a conservative media outlet could provoke counter-contagion. For the latter, the portrayal of Democratic candidates, particularly the positive representation, by conservative media somewhat violates expectations, thus likely leading to unfavorable consequences (Bucy & Bradley, 2004; Burgoon, 1993). This seemingly counterintuitive association is not uncommon in politics. Political candidates are often trained to express their emotions in a certain way, but their trained facial displays through media construction may not always work to appeal to voters.

Further, building on the previous literature (e.g., Elfenbein, 2014; McHugo et al., 1985), we hypothesize that the emotional (counter)-contagion effect will vary among individuals based on their political orientations. That is, a Democratic candidate's positive facial expressions on liberal media are likely to evoke positive feelings, particularly among Democrats, whereas a similar display on conservative media may elicit negative feelings, especially among non-Democrats. The phenomenon can also be explained by the hostile media effect, which suggests that information sources can influence how partisans perceive and assess the same information (Reid, 2012). For example, Gunther et al. (2017) demonstrated that, when an out-group source presents the same content as an in-group source, it tends to lead perceptions of bias in a hostile direction. While the hostile media effect measures a different concept from ours, it implies that different media types are likely to produce distinct effects on different individuals, even when conveying the same emotions. Taken together, we propose:

H1: **(a)** There is a positive association between the public's feelings for the Democratic candidates and their exposure to the liberal media's portrayals of the candidates' facial expressions of emotions. **(b)** The association is stronger among Democrats.

H2: **(a)** There is a negative association between the public's feelings for the Democratic candidates and their exposure to conservative media's portrayals of the candidates' facial expressions of emotions. **(b)** The association is stronger among non-Democrats.

Although a few prior studies examining emotional contagion explored the association between emotional stimuli and opinions or behavior directly (e.g., Masch et al., 2021), we conceptualize this emotional effect as a multi-step process: Emotions initially transfer from the sender to the recipients, and the elicited emotional reactions subsequently shape cognition and behavior. The literature on affective priming can help illuminate this process.

Affective priming

Media priming refers to the effects of the media content on the audience's later judgment or behavior related to the content that was processed (Roskos-Ewoldsen & Roskos-Ewoldsen, 2009). Research on political priming often examines how news influences the standards by which people evaluate governments, policies, and political actors (Iyengar & Kinder, 1987). Psychologically, media priming consists of at least two steps (Moy et al., 2016) and is based on an associative network model (Anderson, 1983; Anderson & Bower, 1973), which states that human memory consists of a network of nodes that are associated with each other. Each node represents a topic, concept, or any other construct. In the first step of priming, media content activates some of the receiver's preexisting nodes, making the nodes more accessible. In the second step, the receiver uses the primed nodes to evaluate a subsequently encountered object. Media priming is effective because the network of nodes is too extensive and complicated to process in its entirety when making decisions, whereas the activated nodes serve as an information shortcut for individuals to use.

Affective priming adds the affective dimension to the theory (Sheafer, 2007). The term affect is conceptualized differently in different research contexts. In psychology, affect has been conceptualized as the superordinate category for valenced states (e.g., Gross, 1998). Within the realm of political communication, some scholars studying affective priming have explored affect as the evaluative tone of particular objects (Balmas & Sheafer, 2010; Sheafer, 2007). They found that media exposure increases the salience of

certain affective attributes related to an issue or a political candidate (e.g., reliability vs. lack of reliability for a politician), which then primes a specific political judgment or behavior. Other scholars examining affective priming (or similar concepts) focused on emotions or feelings as a specific type of affect. To explain, an individual's associative network of nodes also includes emotions (Bower, 1981). Activation of a specific emotion node will trigger the activation of associated thoughts and behaviors that align with the emotion through a process of spreading activation (Erisen et al., 2014). In other words, an aroused positive feeling in an individual through media exposure (e.g., emotional contagion) will prompt the retrieval of positive considerations about the target political candidate in that person's memory, subsequently influencing their opinion and behavior (Kühne et al., 2011). The affect-congruent information is also easily stored in memory because it requires fewer cognitive processing resources (Lang, 2000). Baumgartner and Wirth (2012), for example, showed that the affective response to one news article will carry over to subsequent ones, leading readers to better retain affect-aligned information. Based on this body of literature, our study of affective priming also examines how the aroused feelings from media exposure influence subsequent decision-making.

Furthermore, repeated exposure to emotional primes can have lasting effects (Erisen et al., 2014). While the short-term priming effect may fade within hours after media exposure (Carpentier et al., 2008), continued media coverage increases the chronic accessibility of constructs, resulting in a long-term priming effect (Price & Tewksbury, 1997). Also, the interaction between emotion and cognition forms an ongoing and mutually influential process (Lazarus, 1991). de Hoog and Verboon (2020) gave an example of a downward spiral of appraisal, in which an individual repeatedly exposed to consistent negative news information can trigger a sequence where the aroused negative feelings feed into increasingly negative evaluations of the news, and this cycle continues. In our case, the media's repetitive representation of a candidate's happy face has the potential to not only activate, but also strengthen voters' positive feelings toward the candidate, foster related positive thoughts, ultimately shaping their evaluations of the candidate and even influencing their voting choices. It is important to clarify that the mediated emotional impact is a complex process involving multiple steps, and that scholars have used different terms to explain this process (Erisen et al., 2014). Our study employs the affective priming framework to specifically investigate two key stages: (1) emotional contagion or counter-contagion from the media to the public, the priming process, and (2) how these primed emotions influence voting decisions, the priming consequence.

Empirically, researchers indeed have found a significant association between the media representation of candidates' facial expressions of

emotions during an extended period of time and the voting results (e.g., Masch et al., 2021). However, these studies conducted at the aggregated level did not consider individual voters' specific media exposure, thus they cannot establish the needed evidence for inferring the media priming effect. Moreover, to what extent voters will base their decisions on the emotions evoked by partisan media is another theoretically intriguing question. Here, it makes sense to assume that Democratic voters would choose their candidates based on the positive emotions primed by liberal media. Assuming the conservative media would result in a counter-contagion of emotions as discussed above, it remains unclear how their primed emotions will influence Democrats' voting decisions. We propose:

H3: The exposure to liberal media's portrayals of the Democratic candidates' facial expressions is positively associated with Democratic voters' feelings toward the candidates, which will in turn be positively associated with their voting decisions.

RQ1: How is the exposure to conservative media's portrayals of the Democratic candidates' facial expressions associated with the Democratic voters' electoral decisions through influencing their feelings?

It is important to note that some scholars consider emotion as discrete states such as fear, anger, and disgust; and each emotion is shown with a variety of related but visually different facial expressions (Grabe & Bucy, 2009). Others conceive emotion as a construct with three underlying dimensions: valence, arousal, and dominance (Lang et al., 1995). We adopt a dimensional perspective with a particular focus on valence: a continuous emotional response ranging from positive to negative. This is because we examine the effect of repeated media exposure to candidates' facial expressions over time rather than a single exposure, making it challenging to isolate the influence of any specific facial emotion. On the other hand, media exposure for an extended period of time could potentially result in a blend of diverse feelings among the audience toward the candidates. Therefore, a valence approach to emotion offers a more holistic perspective to capture the overall emotions from both the media and the public sides, thus enhancing the study's external validity.

Method

The study examines the emotional impact of partisan media at the individual level by matching the partisan television news analysis results and a public survey among New Hampshire voters. This matching approach, or

linkage analysis (e.g., Scharkow & Bachl, 2017; Shehata & Strömbäck, 2013), considers each respondent's specific news exposure and their feelings toward and voting decisions about the six political candidates, thus enabling us to better estimate media effects.

Media: A computer vision analysis

Our first goal is to examine the six political candidates' facial expressions of emotions presented in partisan television news. Given a large amount of news data, we leveraged computer vision techniques and built a model to predict the facial expressions of emotions automatically. Facial expression recognition (FER) is the process of automatically identifying human facial expressions and emotions from digital images or videos of human faces (Tian et al., 2011). Here, we adopted a state-of-the-art deep-learning-based FER system for analyzing candidates' facial expressions of emotions.

Data collection and preparation

The television news data was retrieved from the Internet Archive's TV News Archive channel (Internet Archive, n.d.). We queried each candidate's full name and selected videos uploaded between January 1 and March 2, 2020, right before our New Hampshire survey was distributed. A total of 28,297 news video clips were retrieved and downloaded. Each video clip lasted one minute. As the study is part of a larger project, the data were collected from various news sources, but the present analysis focuses on three partisan media outlets: CNN and MSNBC representing liberal media, and Fox News representing conservative media ($N = 3{,}359$).

As the video clips were retrieved based on the candidate mentions in captions, the actual clips may or may not contain the candidates' faces. We used ArcFace (Deng et al., 2019), a state-of-the-art face recognition system, to extract all face-presenting frames. Frames are still images that compose the complete video clip with examples shown in Figure 1.

Consecutive frames for the same candidate were clustered into sub-clips. Given that a typical human expression lasts up to five seconds (Ekman, 2007), those video clips longer than five seconds were segmented into five-second clips. This process yielded a total of 26,125 video clips of 1–5 seconds in length.

Manual content analysis

We operationalized the analysis of facial expressions of emotions as a three-class classification problem: positive, neutral, and negative emotions. The classification model we built involved supervised learning: We produced a sample of annotated video clips for the model to better learn each candidate's facial expressions. A random sample of 300 video clips for

Figure 1. An illustration of frames.

each of the six candidates was drawn for producing ground truth annotations ($N = 1{,}800$). The unit of analysis was each video clip, ranging from one to five seconds. Two U.S. undergraduate students, who majored in communication, were recruited and instructed to manually code the candidates' facial expressions of emotions (i.e., positive, neutral, and negative) along with other variables from the larger project as shown in Appendix A in the online supplemental materials. After four rounds of training and testing, the facial expression coding reached a robust intercoder reliability of 0.80 Krippendorff's α, which is well above the 0.7 α threshold (Lacy et al., 2015). To ensure the quality of the ground truth annotations, the two coders both coded all the remaining video clips independently. They compared their results and resolved discrepancies to generate a final annotated sample. After removing problematic video clips (e.g., too short), our final annotated dataset includes 1,506 video clips.

FER model building and testing

We modified the state-of-the-art deep learning model—the Frame Attention Network (FAN; Meng et al., 2019)—to build our three-class prediction model. We started with FAN's pre-trained network weights and refined them using our annotated dataset. Then we used a stratified cross-validation strategy to evaluate the performance of the model. We computed the prediction precision and recall on the test set for each round of the validation and concluded the model achieved strong performance, with values ranging from 0.78 to 0.90. This performance is comparable to that observed in other research in this domain (e.g., Joo et al., 2019). See Appendix B in the online supplemental materials for details on the model building and validation. Lastly, we used the model to predict the facial emotion types of all the remaining video clips. The final dataset used for the media content analysis includes 11,349 video clips from CNN, MSNBC, and Fox News.

Public: A survey among NH Voters

A web-based survey was conducted among a representative sample of New Hampshire voters during the 2020 New Hampshire Democratic presidential primary. Qualtrics, a U.S.-based international survey firm, administered the survey. The survey was approved by the College of Communication Research Review Board, Boston University, for human subject research (COM RRB # 21025). The final sample's demographics closely matched the New Hampshire population in terms of age and gender. The data collection took place right after the primary between February 13 and March 3, 2020. A total of 508 individuals completed the survey questionnaire. All respondents indicated that they voted in the primary.

Dependent variables

To assess the outcome of emotional contagion, the survey respondents were asked: "How would you characterize your feelings for each candidate overall?" with responses ranging from 1 = *extremely negative* to 7 = *extremely positive*. As discussed earlier, feelings refer to subjective experiences that are manifestations of emotions (Ekman, 2007). The measurement aligns with other studies that use self-report measures of emotions (for a review, see Mauss & Robinson, 2009). To examine affective priming, the survey recorded each respondent's voting decision for the New Hampshire primary.

Positive candidate emotion exposure index

For both emotional contagion and affective priming, the independent variable is the degree to which the respondents were exposed to each candidate's positive facial expressions of emotions in the television news. In the survey, the respondents were asked to indicate how often they consumed news from each of the partisan media outlets—CNN, MSNBC, and Fox News—on a five-point scale: 1 = *Never*, 2 = *Rarely*, 3 = *Sometimes*, 4 = *Often*, 5 = *Always*. Following previous research (e.g., Shehata & Strömbäck, 2013), we combined the media use of each respondent and the television news analysis results to construct a positive candidate emotion exposure index for each respondent per candidate and media outlet.To incorporate all three categories of emotions into a single measure, we calculated the coefficient of media favorableness (Deephouse, 2000; Janis & Fadner, 1943). The coefficient measures the degree of a given candidate's positive emotions portrayed in each media outlet during the 40 days before the respondent's survey-taking date. We selected a 40-day timeframe under the assumption that the time lag for priming to occur should be similar to agenda-setting (i.e., four to six weeks), given both effects are assumed to operate on the mechanism of chronic accessibility (McCombs & Valenzuela, 2021). Nevertheless, we acknowledge the choice of time window is arbitrary and should be empirically tested in future research. The coefficient is calculated as follows:

$$\frac{f^2 - fu}{t^2} \quad if \ f > u;$$

$$Coefficient\ of\ media\ favorableness = 0 \quad if \ f = u;$$

$$\frac{fu - u^2}{t^2} \quad if \ u > f.$$

In our case, f (favorable) is the number of video clips with the given candidate broadcasting positive facial expressions of emotion in the given

media outlet during the 40 days, u (unfavorable) is the number of video clips with negative emotions, t is the total number of video clips including the neutral ones. The coefficient ranges from −1 when all video clips about the candidate in a particular media outlet are depicted negatively to 1 when all clips are positive.

Then the coefficient of media favorableness is multiplied by the respondent's reported frequency of using the media outlet from 1 = *Never* to 5 = *Always* to represent each respondent's individual exposure to the media's affective portrayal of each candidate. The positive emotion index captures the likelihood of every respondent being exposed to each candidate's positive expressions in each media source before the survey. Again, the investigation of prolonged media exposure makes it difficult to isolate the unique influence of exposure to either positive or negative emotions. Therefore, we choose to use the coefficient to measure the overall strength and direction of the exposed emotions.

Control variables

We asked respondents about their frequency of consuming news from television, radio, printed newspapers, printed news magazines, and news websites and their informational use of social media. In other words, we examine the impact of media exposure to the candidates' facial expressions, while keeping all other kinds of media exposure constant. We also accounted for the effect of political interest and political efficacy and the demographics: age, gender, race, education, annual household income, and party affiliation as listed in Appendix C in the online supplemental materials.

Data analysis

To answer H1 and H2, the study used linear regression modeling to examine the association between media exposure and the public's feelings toward the candidates. For each candidate, the public's feelings are regressed on the positive candidate emotion exposure index on each of the three news outlets: CNN, MSNBC, and Fox News.

The analysis for affective priming (H3 and RQ1) was conducted only among respondents who voted for Democratic Party candidates ($n = 291$). This group of respondents indicated in the survey that they voted for a Democratic candidate, including the six considered in the analysis as well as other options. Since the New Hampshire primary is an open primary, undeclared voters can vote for candidates of either party. Therefore, the voters of the New Hampshire Democratic primary included voters registered as Democrats and others registered with different parties. For clarity, we use *Democrats* to refer to the respondents who were

Democratic Party members and *Democratic voters* to refer to those who voted in the Democratic primary.

Because we examine affective priming as a two-step process, we performed a bootstrapped meditation analysis using Hayes' PROCESS (version 4.1) on SPSS (model 4). We account for the temporal effect by examining the association between the respondents' survey responses and their 40-day prior media exposure through media content analysis. As the outcome variable is binary (i.e., vote for the candidate or not), logistic regression was used to examine the direct and indirect relationship between the independent and the outcome variable.

Results

Emotional contagion

In answering H1a, the results show that the exposure to all candidates' positive facial expressions of emotion on MSNBC is positively associated with the public's feelings toward them, with the exception of Yang. The same correlation is found in CNN's representations of Buttigieg, Klobuchar, and Warren. As for H2a, we found that the exposure to the candidates' positive emotions presented on Fox News is negatively associated with the public's feelings toward them. This is an emotional counter-contagion effect in that the more the conservative media outlet broadcasts positive facial expressions of Democratic candidates, the more negative the viewers feel about them. Together, considerable evidence supports H1a and H2a.

The results about H1b demonstrate that, for CNN's portrayals of Biden, Klobuchar, and Yang, and MSNBC's portrayals of Buttigieg and Klobuchar, the positive association between media exposure and the public's feelings toward the candidates is clearer and stronger among the respondents who were not identified as Democrats than Democrats. For example, the more the Republicans and other non-Democrats were exposed to Biden's positive facial expressions of emotions on CNN, the more positive they would feel about him as illustrated in Figure 2. This effect, however, is not clear for Democrats. H1b was rejected.

As for H2b, the results reveal that for two candidates Biden and Sanders the emotional counter-contagion effect of Fox News is stronger among non-Democrats, supporting the hypothesis. As Figure 3 shows, for instance, after exposure to Sanders' positive facial expressions on Fox News, Republicans and the undeclared would feel more negative toward him to a larger extent than Democrats. See Table 1 for a summary of the results.

Turning to H3, for MSNBC's portrayals of Biden, Sanders, and Buttigieg, and CNN's depictions of Buttigieg and Warren, the media-primed positive

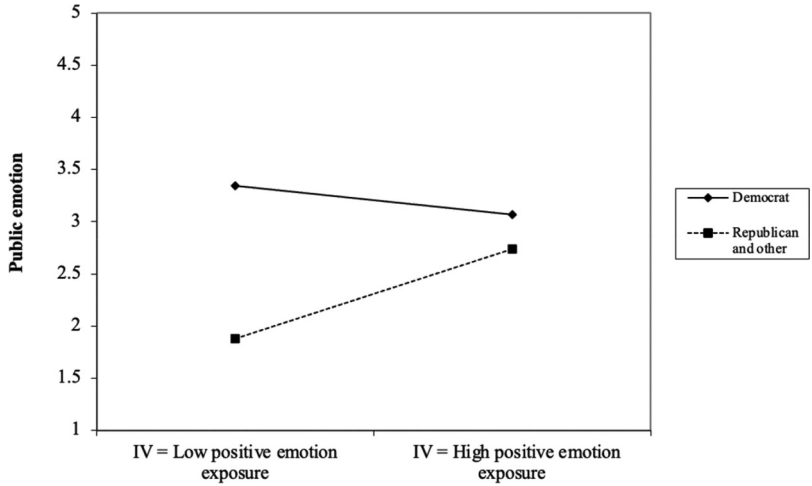

Figure 2. CNN exposure and the public's emotions toward Joe Biden.

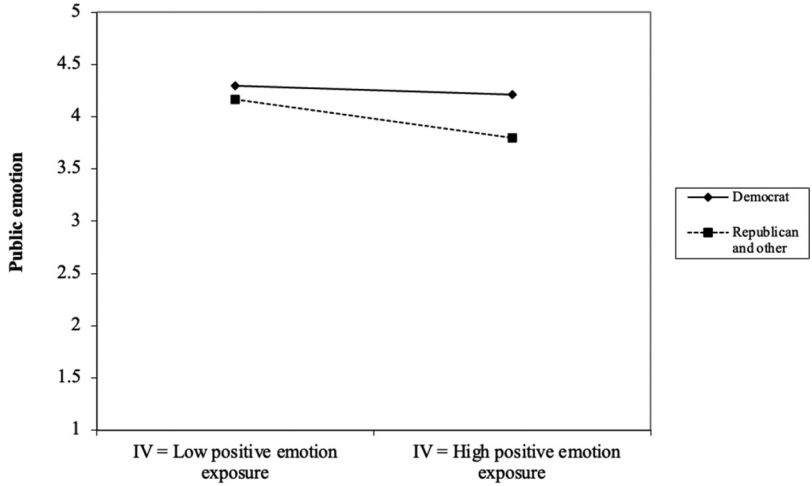

Figure 3. Fox news exposure and the public's emotions toward Bernie Sanders.

emotions would make the respondents more likely to vote for the candidates. H3 was supported with considerable evidence. To address RQ1 concerning Fox News, the media-primed negative emotions toward all candidates except Yang would decrease the likelihood of the respondents voting for them.

Though not hypothesized, it is noteworthy that the direct association between media exposure and the public's voting decision is rare. In addition, we found some inconsistent mediation effects. Consider the exposure to Biden's positive facial expressions of emotions on Fox News

Table 1. A summary of emotional contagion and affective priming effects.

	Biden	Sanders	Buttigieg	Klobuchar	Warren	Yang
Emotional contagion - All voters ($N = 508$)[a]						
Main Effect						
CNN	ns	ns	Positive (0.13**)	Positive (0.11*)	Positive (0.15**)	ns
MSNBC	Positive (0.12*)	Positive (0.13**)	Positive (0.17**)	Positive (0.11*)	Positive (0.12**)	ns
Fox News	Negative (−0.28**)	Negative (−0.30**)	Negative (−0.28**)	Negative (−0.23**)	Negative (−0.28**)	Negative (−0.11*)
Interaction effect						
CNN	Pos x Rep (0.50**)	ns	ns	Pos x Rep (0.50**)	ns	Pos x Rep (0.44**)
MSNBC	ns	ns	Pos x Repub (0.39**)	Pos x Rep (0.30*)	ns	ns
Fox News	Neg x Rep (−0.50*)	Neg x Rep (−0.59**)	ns	ns	ns	ns
Affective priming - Democratic Voters ($N = 291$)[b]						
Indirect effect						
CNN	ns	ns	Positive (0.01[c])	ns	Positive (0.03[c])	ns
MSNBC	Positive (0.38[c])	Positive (0.12[c])	Positive (0.01[c])	ns	ns	ns
Fox New	Negative (−0.25[c])	Negative (−0.81[c])	Negative (−0.05[c])	Negative (−0.01[c])	Negative (−0.14[c])	ns
Direct effect						
CNN	ns	ns	ns	ns	Negative (−0.09*)	ns
MSNBC	ns	ns	ns	ns	ns	ns
Fox News	Positive (0.33**)	ns	ns	Positive (0.02*)	ns	ns

[a]Cell entries are final-entry OLS standardized coefficients (β).
[b]Results are expressed in a log-odds metric. The positive candidate emotion exposure indices were all multiplied by 100 for better odds ratio interpretation.
[c]With 5,000 bootstrap samples and 95% confidence intervals (CIs), the mediation effect is considered significant if zero is not in between the bootstrap lower bound (BootLLCI) and upper bound (BootULCI).
[d]Coefficients of significant results are reported: *$p < .05$, **$p < .01$; ns = non-significant.
[e]Complete results for all the models can be found in Appendices E and F in the online supplemental materials.

as shown in Figure 4. The media exposure directly increased one's likelihood to vote for Biden: $OR = 1.39$, $p = .002$. However, the exposure was also associated with a negative feeling for Biden, which would then make the viewer less likely to vote for him: indirect effect: $OR = 0.78$, 95% CI [0.12, 0.86]. The same inconsistency was found in the Fox News depiction of Klobuchar. The media effects with respect to Warren demonstrate a different pattern as illustrated in Figure 5. Exposure to Warren's positive facial expressions of emotions on CNN directly decreased the likelihood of voting for her: $OR = 0.91$, $p = .011$. However, the media exposure was also associated with a positive feeling toward the candidate, which is then associated with a positive voting outcome: indirect effect: $OR = 1.04$, 95% CI [1.00, 206.58].

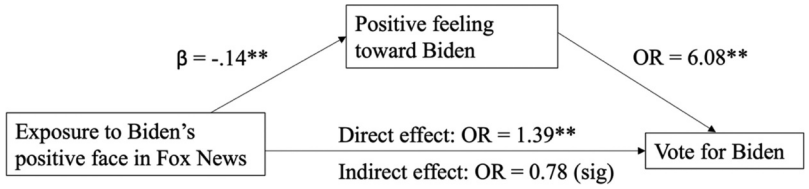

Figure 4. Fox news depiction of Joe Biden, the public's emotions, and their voting decisions.

The positive candidate emotion exposure indices were all multiplied by 100 for better odds ratio (OR) interpretation. With 5,000 bootstrap samples and 95% confidence intervals (CIs), the mediation effect is considered significant if zero is not in between the bootstrap lower bound (BootLLCI) and upper bound (BootULCI). *$p < .05$; **$p < .01$.

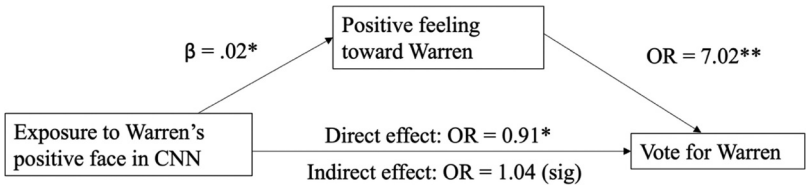

Figure 5. CNN's depiction of Elizabeth Warren, the public's emotions, and their voting decisions.

The positive candidate emotion exposure indices were all multiplied by 100 for better odds ratio (OR) interpretation. With 5,000 bootstrap samples and 95% confidence intervals (CIs), the mediation effect is considered significant if zero is not in between the bootstrap lower bound (BootLLCI) and upper bound (BootULCI). *$p < .05$; **$p < .01$.

Discussion

By analyzing the 2020 New Hampshire Democratic Party presidential primary, this study demonstrates that the U.S. partisan media outlets effectively lead to emotional contagion or counter-contagion and exhibit a significant affective priming effect. The conservative and liberal media's representations of the political candidates' facial emotions were significantly associated with the voters' feelings toward the politicians. Moreover, the media-primed emotions among the voters consistently align with their voting decisions.

Theoretically, the research contributes to the literature by suggesting that the partisanship of media outlets provides a contextual cue for people to interpret the mediated candidate images, which helps determine the contagion or counter-contagion of emotions. Second, we have articulated that affective priming involves a multi-step process where the emotions transfer from the media to the public—known as the emotional contagion or counter-contagion priming process—which subsequently influences their political

decision making, known as the priming consequence. Third, the emotional effect may take some time to kick in; it would not always occur like an immediate knee-jerk reaction after exposure to candidate images or videos. All these conclusions are grounded in empirical evidence found in this study.

In particular, the study provides strong empirical support that the portrayal of politicians' facial expressions of emotions in a specific type of media—partisan media—has a significant association with citizens' feelings. Researchers of visual communication have frequently showcased the presence of visual biases in how partisan media depict politicians (e.g., Grabe & Bucy, 2009; Hehman et al., 2012; Peng, 2018). For example, Peng (2018) demonstrated that partisan media tend to portray similar-minded politicians with more positive facial emotions and depict those with opposing views in a less favorable light. In our research, this pattern does not apply uniformly to all the six candidates. For example, Biden and Sanders were depicted more positively on Fox News than on CNN and MSNBC as shown in an analysis of visual differences in partisan media in Appendix D in the online supplemental materials. What is noteworthy is that, as our results reveal, positive candidate emotions in the news do not always elicit positive feelings among the audience. We found that, when voters are exposed to a political candidate's positive facial expressions on CNN and MSNBC, they will develop a more positive feeling and are eventually more likely to vote for the candidate. Seeing a candidate's positive face on Fox News, however, induces a negative feeling among the Democratic voters, who are then less likely to vote for the shown candidate. These findings indicate that the context of communication intervenes in the process of emotional transfer (Bucy & Bradley, 2004). Notably, when Fox News broadcasts some Democratic candidates' positive emotions, the contextual clues—the lack of a "shared vantage point" (Elfenbein, 2014) between the media and the politicians as well as the possibly unexpected positive depiction from a counter-attitudinal media—ultimately lead to the counter-contagion of emotions. Based on the results, we suggest that the conceptualization of partisan media's visual bias in terms of facial expressions should take context and medium into consideration in addition to evaluating the positivity and negativity of the emotions presented.

Whether it is emotional contagion or counter-contagion, our findings demonstrate the power of partisan media in shaping voters' feelings and reveal that voters will rely on such media-primed emotions as cues to make political decisions. Experts have long worried that Americans vote more with their hearts than their minds, choosing candidates based on their images rather than stances on issues (Fording & Sanford, n.d.). This study adds that partisan media may influence the election outcome by evoking voters' feelings pivoted toward their party's interests. Considering

the increased polarization of the U.S. political landscape, it seems that Americans are not just divided by arguments but also by their feelings thanks to the emotional impact of partisan media.

Also significant is the divergence of emotional impact on voters of different political orientations. We found that both the emotional contagion of liberal media and the counter-contagion effect of conservative media were stronger among voters who did not identify themselves as Democrats. Because what we consider here is a Democratic primary, for which Democrats might already have developed their opinions, or had other sources of information, and therefore were less susceptible to the media influence. In contrast, Republicans and the undeclared voters might know relatively less about the competing candidates, on whom the media could exert a larger influence. Instead of relying solely on the shared vantage point hypothesis between the senders and recipients (Elfenbein, 2014), this phenomenon may find a more apt explanation in the need for orientation concept from the agenda-setting literature. According to this concept, individuals who are uncertain about a subject are more susceptible to the influence of media coverage (McCombs, 2004). The results also have important practical implications for campaign professionals. Nearly half of the respondents in our sample indicated they were politically independent or something else. The undecided account for a large portion of the voting public, and partisan media may be especially influential in stimulating the feelings of this critical group.

We reiterate that the affective priming effect involves at least two steps (Moy et al., 2016): Media exposure influences the voters' political behavior by shifting their feelings toward the target candidate. That is, the direct link between media exposure to facial expressions and the voting outcome may not exist. Results of the study provide ample evidence for this indirect-only effect, indicating that if one's feeling toward a political candidate remains unaffected after the media exposure, their voting decision would not change. In rare cases, the directions of the direct and indirect effects appeared to be the opposite. For example, the Democratic voters exposed to Biden's and Klobuchar's positive faces on Fox News often were more likely to vote for the two. Perhaps, some voters were immune to emotional arousal from Fox News and remained positive about the two candidates. However, if the Fox News exposure did make the viewers feel negative toward Biden and Klobuchar, their likelihood of voting for them would decrease. Together, our findings suggest that the association between media exposure and political behavior operates through multiple psychological mechanisms and is worth more systematic research in the future.

Lastly, it is notable that the media effects are slightly different by the candidate. For example, seeing Yang's cheerful expression in liberal media would not make any difference among the viewers. And the exposure to Warren's positive expression on CNN is directly associated with a lower likelihood of voting for her. These results may be related to the nature of

party primaries where voters have many choices and, therefore, media effects should be considered in a relative sense. Yang, for instance, was considered a long-shot candidate, which may explain the lack of media effects with respect to him. The candidate differences also speak to previous research findings that the visual impact of facial expressions would be confounded by factors such as the gender, race, and age of the portrayed candidates and the audiences perceiving them (e.g., Masch et al., 2021). Voters may have a different expectation for Warren—the top female candidate at the time—than for her male counterparts. Or, they might expect a dominant white middle-aged man to beat the incumbent Trump in the general election and thus look for dominance rather than warmth (Nilsen & Zhou, 2020). We leave the investigation of these personal factors a direction for future research.

This study is also methodologically innovative. First, instead of using off-the-shelf computer vision solutions (Peng, 2018) or relying on a predefined system (e.g., define a smile as a happy expression, Joo et al., 2019), we trained our own facial expression detectors while leveraging state-of-the-art deep learning models. Our models achieved a high level of accuracy through systematic validation as shown in Table A1 in Appendix B in the online supplemental materials. Second, our use of a matching strategy to link the actual media exposure and the public's feelings and thoughts affords a better estimation of the media effects at the individual level. The approach also better reflects reality, and, therefore, is more externally valid than experimental research of this kind. Lastly, selecting the earliest stage of a political campaign as a research context also adds validity to the study in that voters are just about to develop their opinions and attitudes.

The research has several limitations. First, though the study accounts for the temporal effect, it would be better to conduct a multiple-wave panel survey to examine emotional contagion and affective priming as a type of long-term media effect. Second, although our individual-level analytical approach is superior at inferring causal relationships than an aggregated one, our results indicate associations rather than causations. In particular, unlike experimental research, our research design does not afford the examination of any nuanced emotional effect such as the distinct impact of exposure to either positive or negative emotions, or a specific emotion (e.g., anger). Nor does the study examine the unique influence of emotional exposure relative to other contextual information in the news. Future research should consider a more sophisticated design to account for these factors and enrich our understanding of the mediated emotional impact. Lastly, measurement errors in both the media content analysis and the media use self-reports may lead to minimal media effect findings in linkage analyses (Scharkow & Bachl, 2017). This might account for some of the insignificant findings in our study. Conversely, the possibility of under-estimation strengthens our confidence that our detected effects truly exist.

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