Article

Do News Frames Really Have Some Influence in the Real World? A Computational Analysis of Cumulative Framing Effects on Emotions and Opinions About Immigration

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Abstract

This study examines how the news framing of immigration influences the public's feelings toward immigrants and their preference for immigration policy in the United States. Unlike prior experimental research that documents the respondents' immediate reactions to several hand-crafted news frames, this study provides strong empirical evidence for the association between the respondents' real-world news exposure and their opinion change over time. Combining a computational media content analysis and a two-wave panel survey, the research demonstrates that while exposure to certain frames in the mainstream media would directly lead to public support for a stricter immigration policy, partisan media tend to affect public opinion indirectly by influencing their feelings toward immigrants in opposite directions.

Keywords

framing effects, partisan media, cross-cutting exposure, machine learning, deep learning, BERT, panel survey

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The framing of news media has been considered powerful, influencing what people believe, how they feel, and even how they behave (Lecheler and De Vreese 2019). Amidst the abundance of media choices individuals face in today's world, the effects of framing deserve renewed consideration. Most of the existing research that relies heavily on experiments lacks external validity that can accurately reflect the complexity of the current media landscape. As scholars have questioned whether we have entered an era of minimal media effects (Bennett and Iyengar 2008), we ask: Do news frames really have some influence in the real world?

Knowledge of framing effects in relation to partisan media is also limited. Studies have shown that exposure to pro- and counter-attitudinal media would lead to differing effects on individuals with varying political beliefs (e.g., Chen et al. 2020; Wojcieszak et al. 2016). Given that partisan media tend to frame issues differently (Levendusky 2013), framing effects carried by distinct partisan media outlets should have divergent effects on individuals depending on their political affiliations.

This study seeks to examine framing effects by accounting for the magnitude and diversity of media messages individuals encounter and their distinct news consumption patterns. The goal is two-fold: first, to investigate the specific news framing content individuals are exposed to over time and its real-world effects; second, to explore how the frame exposure from different types of media—mainstream and partisan—influences the emotions and opinions of different individuals. Methodologically, this study employs an approach that combines a computational media content analysis and a two-wave panel survey.

We focus on the framing effects of immigration because the issue is increasingly important worldwide, following the 2015 refugee crisis in Europe, the 2016 Brexit referendum, and more recently, the former Trump administration's immigration crackdown in the United States. In the U.S. context, immigration is one of the most controversial and polarizing topics, and public opinion is still malleable (Haynes et al. 2016). Some media frames are likely to influence individuals' policy preferences, while others may evoke strong emotions, creating a climate that can have real-life consequences for immigrants. It is particularly crucial to understand the framing effects of partisan media due to their rising power to shape public opinion and their tendency to arouse emotions toward specific targets (i.e., immigrants in our case; Hasell and Weeks 2016). Our study investigates how exposure to different news frames of immigration in the mainstream and partisan media influences different people's emotions and opinions.

News Framing

The theory of news framing has multiple paradigms and involves varied analytical focuses, such as identifying frames as thematic units in news, exploring framing as a process, and examining the effects of framing (D'angelo 2002; Entman 1993). To be specific, a news frame refers to "the central organizing idea for news content that supplies a context and suggests what the issue is" (Tankard et al. 1991: 3). Generic frames, such as *human interest* and *conflict*, appear across issues, time, and space. Issue-specific frames are applied to a particular political issue (Boydstun et al. 2014; De

Vreese 2005; Semetko and Valkenburg 2000). Other research unpacks framing as an action: "to frame is to select some aspects of a perceived reality and make them more salient in a communicating text" (Entman 1993: 52). A framing effect occurs when the media message interacts with prior knowledge to affect an individual's understanding, opinion, emotion, or behavior toward an object (Lecheler and De Vreese 2019).

Framing Immigration and Effects

Previous research has identified a variety of frames related to immigration in both the U.S. and European contexts. The list includes both generic and issue-specific frames. As for the former, the generic frame *politics* characterizes the party politics of the debate, *economic consequences* (hereafter "economy") is about economic benefits or costs involving the immigration issue, *public opinion* addresses the protests and public reactions toward the debate, and *regulation* focuses on legislations and other institutional measures about immigration (e.g., Eberl et al. 2018; Grimm and Andsager 2011; Haynes et al. 2016; Quinsaat 2014). When it comes to issue-specific frames (e.g., Benson 2013; Eberl et al. 2018; Fryberg et al. 2012; Greussing and Boomgaarden 2017; Haynes et al. 2016; Quinsaat 2014), the *crime* frame describes immigration and immigrants as threats to a nation's safety, *culture* is about cultural or societal-wide factors related to immigration, the *family* frame addresses the influence of immigration on families, and *well-being* speaks to immigrants' experience of prejudice and bias. Frames also vary depending on the type of immigrants, such as their ethnicity and legal status, and the specific discourse of each country (Eberl et al. 2018; Van Gorp 2007).

Apart from identifying news frames related to immigration, researchers have sought to uncover the impact of different frames on people's opinions (i.e., volatile beliefs that include an evaluative judgment of immigration policies) and attitudes (i.e., general predispositions toward immigration or immigrants; Bos et al. 2016). In particular, numerous studies have manipulated the framing of immigration stories in experiments to observe their influence on policy support (e.g., Druckman et al. 2013; Lahav and Courtemanche 2012; Merolla et al. 2013). While most research did find that media framing of immigrants and immigration influences public opinions and attitudes, Theorin et al.'s (2021) recent analysis revealed that the framing effects were few, weak, and not robust across countries within Europe. Research has also shown that the framing effect varies by the content of frames as well as the receivers. For example, Lahav and Courtemanche's (2012) experiment revealed that the *crime* frame tends to have a stronger impact than the *culture* frame in influencing the audience's policy preference and that liberal-leaning participants were more responsive to the framing effect than conservatives.

News framing of immigration is also effective in eliciting emotional responses. Igartua et al. (2011) found that the *crime* frame produced a significant effect on the participants' emotions. A different experiment revealed that specific frames caused stronger emotional responses than others and that certain emotions functioned as mediators of framing effects on opinions about immigration (Lecheler et al. 2015).

Framing as a Cumulative Effect

Most framing effects studies relied on experiments, with most of those based on a one-shot design. While this method is superior at establishing causal relationships between frame exposure and changes within the participants, it cannot adequately account for real-world news framing effects. It is more realistic to assume that individuals are exposed to repetitive news frames over time. Moreover, while some people may be exposed to one-sided news frames consistently, it is more common to read news stories with different and even competing frames, which may "cancel out" the media effects (Chong and Druckman 2010). Acknowledging the limitations of the one-shot design, recent framing scholarship has begun to discuss and use an over-time experimental design (Lecheler and De Vreese 2016). However, even the longitudinal design cannot control the events that occur between experimental exposures (Druckman et al. 2012). After all, the literature on over-time framing effects research is in its infancy, and how cumulative frame exposure influences individuals other than their opinions remains unknown (Lecheler and De Vreese 2016).

Our study examines how *cumulative* frame exposure predicts cognitive and emotional outcomes in a real election context. First, we expect that cumulative exposure to different news frames on immigration will influence public opinion—individuals' preference for a more relaxed or stricter immigration policy. The accessibility and applicability mechanisms of information processing can be considered to understand the cognitive framing effect. The former suggests that repeated exposure will increase the accessibility of the given news frame (Cappella and Jamieson 1997). As a result, individuals are more likely to use this frame when forming their opinions, leading to a stronger framing effect. However, frames are not equal in their applicability to interpret the issue at hand. For example, the *crime* frame may be a more applicable consideration of the immigration issue, thus more effective in affecting public opinion than other frames. While some scholars have argued that framing is unique in its applicability mechanism (Price and Tewksbury 1997), recent scholarship considers that accessibility and applicability go hand-in-hand in everyday information processing (e.g., Tewksbury and Scheufele 2019). We expect that (1) more frequent exposure to a frame leads to a greater change in opinion (accessibility) and (2) the effect varies by frame and only applies to some frames but not all (applicability). We clarify that the study focuses on the two mechanisms of the framing effect and leaves the theorization of each specific frame' effect a future research direction.

> **H1:** More frequent frame exposure will lead to a greater change in opinion about immigration, by enhancing the preference for either a more relaxed or stricter immigration policy (*accessibility*).
> **RQ1:** How does the effect on opinion vary by frame (*applicability*)?

As for emotional outcomes, we anticipate that being exposed to certain news frames of immigration over time will influence the audience's emotions toward immigrants. Cognitive appraisal theories suggest that when individuals encounter an event, they

appraise the situation to elicit an appropriate emotional response (Lazarus 1991b; Lazarus and Folkman 1984). For news framing, the processing of a particular frame will activate specific appraisal patterns, which will produce a particular type of emotional reaction (Nabi 2009; Kühne and Schemer 2015). Most of these studies rely on experiments in which researchers handcrafted news frames corresponding to discrete emotional responses. However, applying the one-on-one frame-emotion formula in reality is hard, and the cumulative effect of news framing on emotions is rarely examined.

Theoretically, after the initial appraisal, individuals continue to *reappraise* the situation if new information becomes available (Lazarus 1991b). While the initial appraisal will lead to certain emotions, the subsequent reappraisals can enhance the effect and the effect will persist (Ahn et al. 2015). This is because the interaction between cognition and emotion is a continuous bidirectional process (Lazarus 1991a). Individuals exposed to similar negative news information over time, for example, may end up with a downward spiral of appraisals in which negative appraisals lead to negative emotions, which, in turn, lead to more negative appraisals of the news, and so forth (de Hoog and Verboon 2020).

Taken together, the literature suggests that, first, repeated exposure to specific news frames will lead to a change in the degree of emotions over time. For example, the *crime* frame may make one feel fear of immigrants and repeated frame exposure may increase the fear. Second, the effect of eliciting and enhancing emotions should vary by frame in that some frames may be more effective at activating appraisals than others. Third, given that the elicited emotions will, in turn, trigger cognition, emotions should mediate the effect of news frames on opinions (Kühne and Schemer 2015; Nabi 2009).

Cognitive appraisal theories are often used to predict discrete emotions. However, in reality, individuals are exposed to different news frames and will generate mixed emotions. As it is hard to isolate the effect of a certain frame on its corresponding emotion outside of an experiment, our research approaches emotions from a dimensional perspective and focuses on valence, a continuous affective response ranging from positive to negative (Lang et al. 1995). We expect that cumulative exposure to certain news frames of immigration will make the audience feel more positive or negative toward immigrants over time, which will, in turn, predict emotion-congruent opinions.

We distinguish between emotions toward different types of immigrants. In the U.S. discourse, immigrants who are in the country illegally are always at the center of controversy. We use the term "illegal immigrants" to refer to this group of people for consistency in writing rather than to suggest any political implication. While Americans remain concerned about illegal immigration, their support for increasing the level of legal immigration has risen over the years (Pew Research Center 2018a). It is logical to assume that different news frames will influence emotions toward legal and illegal immigrants differently.

H2: More frequent frame exposure will lead to a greater change in the emotional valence toward legal and illegal immigrants, respectively.

RQ2: How does the effect on emotional valence vary by frame?
H3: For some but not all frames, emotions toward the two types of immigrants function as mediators for the effects of frames on opinion. Specifically, an emotional shift in a positive direction will lead to a preference for a more relaxed immigration policy, while an emotional shift in a negative direction will lead to a preference for a stricter immigration policy.

The Effects of Partisan Media

In the U.S. media landscape, conservative and liberal media represent the ideological wings of the Republican and Democratic parties, respectively (Edgerly 2015). These partisan media outlets have grown quickly in numbers and begun to play a leading role in the entire media agenda of America (Stroud 2011). On top of the framing effects outlined above, partisan media should influence public opinions in a specific direction. We hypothesize:

H4a-b: More frequent exposure to news frames in conservative media will (a) enhance the preference for a stricter immigration policy and (b) lead to an emotional shift in a negative direction toward legal and illegal immigrants.
RQ3a-b: How does the effect of conservative media on (a) opinion and (b) emotional valence vary by frame?
H5a-b: More frequent exposure to news frames in liberal media will (a) enhance the preference for a more relaxed immigration policy and (b) lead to an emotional shift in a positive direction toward legal and illegal immigrants.
RQ4a-b: How does the effect of liberal media on (a) opinion and (b) emotional valence vary by frame?

Another intriguing question is the extent to which partisan media's framing effects are moderated by individuals' political orientations. The scholarship on selective and cross-cutting exposure can shed light on this question. Selective exposure refers to the behavior of seeking pro-attitudinal information while avoiding alternative views in one's media consumption process (Freedman and Sears 1965). This indicates that partisan media use patterns are guided by personal beliefs, such as partisan identity. In the United States, citizens increasingly ascribe their partisan positions to like-minded media entities and filter content based on ideological congruence (Stroud 2011). Furthermore, selective perception suggests that exposure to pro-attitudinal media can strengthen one's existing beliefs (Schmitt et al. 2004).

Cross-cutting exposure to counter-attitudinal media also influences one's opinions (Mutz 2002). However, the direction of influence is unclear. On the one hand, cross-cutting exposure drives individuals to learn from opposing views and increase their political tolerance (Mutz 2002). Therefore, one's political stance will be neutralized. On the other hand, people exposed to messages that conflict with their own thoughts are prone to counter-argue through motivated reasoning, which may enhance preexisting beliefs (Taber and Lodge 2006).

Both selective and cross-cutting exposure effects suggest that the type of media conveying the frame can also influence the framing effect. This aspect is also found in some research about the hostile media effect, which shows that information sources can alter how partisans process and evaluate the same information (Reid 2012). For example, Gunther et al. (2017) reveal that, given the same content, an out-group source will push perceptions of slant in a hostile direction. In addition, the source will interact with the content in that in-group sources weaken the impact of content against their position, whereas out-group sources weaken the impact of content in favor of their position. While the hostile media effect measures a different concept from framing effects, it implies that various media types should yield distinct effects even when conveying the same frames. Furthermore, specific frames may interact with the media type, further influencing the outcomes. Because the direction of the framing effects of partisan media is unclear, we ask:

> **RQ5a-b:** Will more frequent exposure to conservative media frames lead to a greater preference for a stricter immigration policy among conservatives compared to others? If so, what are those frames?
>
> **RQ6a-b:** Will more frequent exposure to liberal media frames lead to a greater preference for a more relaxed immigration policy among liberals compared to others? If so, what are those frames?

When it comes to emotions, selective exposure theory suggests that repeated exposure to pro-attitudinal partisan views boosts existing emotions (Knobloch-Westerwick and Meng 2011; Zhu et al. 2021). However, findings about the emotional outcomes of cross-cutting exposure are mixed. While research shows that exposure to competing viewpoints will make people feel ambivalent about their prior emotions (Mutz 2006), this neutralizing effect does not always happen (Wojcieszak and Mutz 2009). We ask:

> **RQ7a-b:** Will more frequent exposure to conservative media frames lead to a greater emotional shift in a negative direction toward legal and illegal immigrants among conservatives compared to others? If so, what are those frames?
>
> **RQ8a-b:** Will more frequent exposure to liberal media frames lead to a greater emotional shift in a positive direction toward legal and illegal immigrants among liberals compared to others? If so, what are those frames?

Finally, the mediating effect of emotions discussed above should also apply to partisan media. Selective or cross-cutting partisan media exposure to different news frames should affect audiences' emotions toward both illegal and legal immigrants, which, in turn, will influence their opinions on immigration policy.

> **RQ9:** For some but not all frames, will more frequent exposure to conservative media enhance conservatives' preference for a stricter immigration policy, mediated by their emotions toward legal and illegal immigrants, compared to others?

RQ10: For some but not all frames, will more frequent exposure to liberal media enhance liberals' preference for a more relaxed immigration policy, mediated by their emotions toward legal and illegal immigrants, compared to others?

Method

This study combines a computational content analysis of news data and a two-wave panel survey. This "matching strategy" method accounts for each respondent's specific media diet and exposure, and the use of a computational approach allows for analyzing a large amount of media data across diverse news sources.

News Frame Analysis

The news frame analysis results are from a larger project, which examines immigration coverage in 2018. We selected eighteen news media outlets to represent both major mainstream and partisan media in the United States (see Supplemental Table A1; Alexa 2018; Pew Research Center 2018b; Statista 2018). The categorization of media outlets is based on multiple sources and considers various factors such as expert opinions and audiences (e.g., Allsides n.d.; Mitchell et al. 2014). News articles were retrieved using Crimson Hexagon's Foresight media analytics platform (now BrandWatch). A list of keywords to locate relevant news stories was created based on the literature review and a preliminary review of a data sample: immigration OR immigrant OR immigrate OR "anchor baby" OR "anchor babies" OR "birthright citizenship" OR "sanctuary city" OR "DREAM act" OR "deportation" OR border OR wall OR migrant OR migration. The search returned a total of 48,020 articles in 2018 from the media outlets' websites. News organizations produce similar content across platforms and store the most comprehensive content on their websites (Guo et al. 2021; Zhang 2021). A random sample of news headlines ($N=2,000$) was content analyzed by human coders, and these annotations were used to train a supervised machine-learning model. The unit of analysis is a news headline. Scholars have suggested that headlines convey the main idea of a news article and influence the reader's interpretation of the subsequent story in a predetermined direction (Guo et al. 2021; Sun and Cheung 2022; Tankard et al. 1991). Also, many users tend to skim news headlines instead of reading articles in their entirety nowadays (Al-Rawi 2017). Two communication students were instructed to (1) determine whether the news headline is indeed about immigration and (2) identify up to two news frames from a list that we synthesized from the previous literature: *crime, economy, culture, family, well-being, politics, regulation*, and *public opinion* (see Supplemental Table A2 for the codebook). We note that the list is not exhaustive, which prioritizes frames popular in the U.S. discourse. The coders reached acceptable intercoder reliability on a random sample of 400 news headlines (0.84 Krippendorff's α for relevance; 0.79 and 0.73 for the first and second frame coding). The coders then coded the rest of the data.

To predict relevance and news frames for the remaining news headlines, we used the model of Bidirectional Encoder Representation from Transformers (BERT; Davlin et al. 2018), based on human annotations. With pre-training on large text corpora, the

BERT model has proven to be among the most powerful deep learning models for natural language processing. Communication scholars have successfully applied and refined BERT to predict topics, agendas, and frames in various cultural contexts (Card et al. 2022; Chen et al. 2019; Guo et al. 2021; Mendelsohn et al. 2021). For each prediction, we began with the input of news headlines into BERT, initiating the vector representation of the textual data (Liu et al. 2019; Tourni 2021). After that, we trained a classification model with multiple layers for relevance and each of the eight news frame predictions based on the pre-trained neural networks and the human-labeled news headlines. With 10-fold cross-validation, the precision of the classification models ranges from 0.83 to 0.95 and the recall 0.94 to 0.97. The nine models were then used to predict relevance and the eight news frames for the remaining news headlines. The final analysis includes 12,093 news headlines published between August 23 and December 3, 2018, to match the survey data discussed next.

Public Agenda: A Panel Survey

A two-wave national panel study was conducted during the 2018 U.S. midterm elections. We used Qualtrics, a U.S.-based international survey firm, to administer both waves of the survey. To match the demographics of the U.S. national population, quotas on gender and age were specified for the sample. The first wave of data was collected between October 2nd and 19th when 2017 respondents completed the survey questionnaire. The second wave was conducted between November 14th and December 4th. There was a 51.5% response rate ($N=1039$) for the second wave.

Dependent Variable (W2)

To measure the change in public opinion over time, respondents in both waves were asked to indicate whether they think it should be harder or easier for people to immigrate to the United States (0=Much harder; 10=Much easier). The opinion recorded in the second wave (W2) was the dependent variable for each model, while the response in the first wave (W1) was used as a control. Overall, the respondents believed the immigration policy should be harder (W1: $M=4.03$, $SD=2.76$; W2: $M=3.89$, $SD=2.71$).

Mediating Variables (W2)

There are two mediating variables: respondents' emotions toward legal and illegal immigrants. In the survey, we asked, "please rate your feelings about the following two groups of immigrants" (0=extremely negative; 10=extremely positive). To clarify, we use the more colloquial word "feelings," which refers to subjective experiences that are manifestations of emotions (Ekman 2007). This is consistent with other studies that use self-report measures of emotions, which often focus on the subjective experience of emotions (see Mauss and Robinson 2009 for a review). However, there is a controversy about the term used to describe people who immigrate to the United States illegally. As the words "undocumented" and "unauthorized" may confuse some

respondents and the legal term "illegal alien" may have overly negative connotations (Ackerman 2013), we use the term "illegal immigrants" in the survey to explicitly distinguish them from legal immigrants. Although the term is not neutral, it would not bias the research results as we focus on the *change* of emotions between W1 and W2. Descriptive statistics show that the respondents on average had a favorable emotion towards legal immigrants but a rather negative emotion toward illegal immigrants (legal immigrants: W1: $M=8.26$, $SD=1.85$; W2: $M=8.22$, $SD=1.96$; illegal immigrants: W1: $M=3.61$, $SD=3.10$; W2: $M=3.47$, $SD=3.06$).

Independent Variables (W1–W2)

The independent variable is the frame exposure from mainstream and partisan media. Using a matching strategy (Rössler 1999; Shehata and Strömbäck 2013), indices of frame exposure were created for each individual respondent by taking into account the person's specific media use. For each of the eighteen media outlets, regardless of the platform (e.g., the *New York Times* newspaper, website, or social media page), the respondents were asked to report their frequency of news consumption based on a five-point scale (1=Never, 5=Always).

The frame exposure indices were calculated for each respondent for each specific media outlet and then aggregated based on the three media types (mainstream, conservative, and liberal). Specifically, for each respondent, the percentage of the specific frame mentioned in each news outlet—measured as the number of immigration articles with the frame divided by the total number of immigration articles published between the two waves of the survey—was multiplied by the respondents' reported frequency of using that media outlet in W2 (1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always). In other words, we measured the effects of cumulative exposure to the news frames for four to six weeks. The specific date range for news exposure is different for each respondent because each respondent completed the first and second waves of the survey on different dates. The eighteen products, each representing a specific media outlet (e.g., percentage of immigration articles with a *crime* frame from *The New York Times* × frequency of reading *The New York Times*), were added based on the three media types and then averaged. That is, the frame exposure index captures the likelihood of every individual respondent being exposed to a specific frame in a certain media type during a certain time period. To be clear, our measure of media exposure is significantly different from that in experimental research because it considers (1) each participant's unique media diet in real life (self-report survey), (2) real-life media frames (content analysis), and (3) the individual's cumulative exposure to these frames from one time point to another (survey matching content analysis).

Control Variables (W2)

Media Use. We measured news consumption from different sources by asking respondents how frequently they got news from traditional sources including printed newspapers ($M=2.56$, $SD=1.31$), printed news magazines ($M=2.19$, $SD=1.13$), television

news (M=3.83, SD=1.16), and radio (M=2.90, SD=1.20). We also asked for their frequency of online news consumption (M=3.66, SD=1.13) and social media use (M=3.25, SD=1.35). All of the measurements were based on a five-point Likert scale (1=Never, 5=Always).

Political Orientation. The study measures the respondents' political orientation by asking, "when it comes to politics and public affairs, where would you place yourself on a scale of 0-10, where 0=Strong liberal (left-leaning) and 10=Strong conservative (right-leaning)?" (M=5.33, SD=2.81).

Other. The analysis controls the effect of political interest by averaging two items based on a seven-point Likert scale, with 1 being "strongly disagree" and 7 "strongly agree": "I'm interested in information about what's going on in politics and public affairs" and "I pay close attention to information about what's going on in politics and public affairs" (M=4.80, SD=1.63). Since the analysis is about one's opinion about the immigration issue, each respondent was also asked whether they had family members and/or friends who were immigrants (37.7% of respondents answered yes). Finally, demographic variables include gender (female=50.5%), age (M=49.08, SD=15.85), education (mode=some college), race/ethnicity (mode=white), and income (mode=$50,000 to $74,999).

Data Analysis

The study used autoregressive modeling to examine the association between news frame exposure between W1 and W2 and the public's opinion about the immigration issue and their emotions toward immigrants on W2, while controlling for the influence of the same variables on W1. To explain, autoregressive modeling considers both between-individual and within-individual variances. For the latter, we measure whether exposure to different news frames on mainstream and partisan media *over time* would lead to a significant *change* in opinion and emotion. For each news frame, we created one model in which the public's opinion and emotions are regressed on the frame exposure indices on each of the three types of news media: mainstream, conservative, and liberal, controlling for the influence of each other. Consider conservative media's *crime* frame as an example. In one regression model about this frame, we examined whether more frequent exposure to the *crime* frame from conservative media would lead to opinion and emotional change, holding constant the amount of exposure to the same frame from mainstream and liberal media as well as the exposure to different types of media overall. Political orientation was added as a moderator to analyze the effects of partisan media.

To examine the mediation effects, we performed a bootstrapped meditation analysis using PROCESS (Hayes 2022). Model 4 was used to examine the indirect effect of mainstream media frame exposure on public opinion about the immigration policy by influencing their emotions toward immigrants (Figure 1), and model 8 was used to examine the same indirect effect of partisan media moderated by political orientation
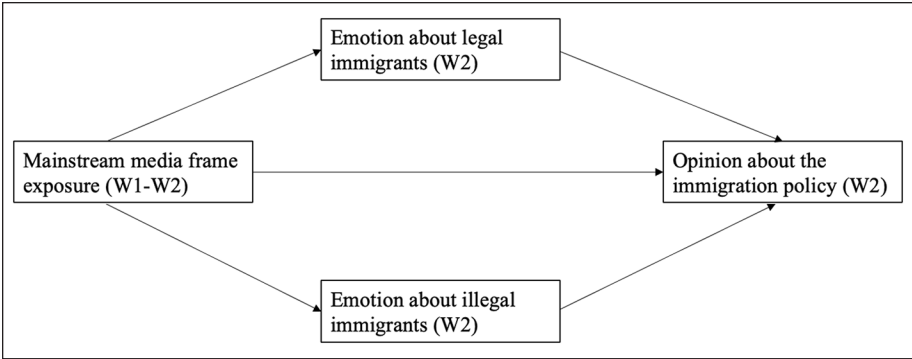
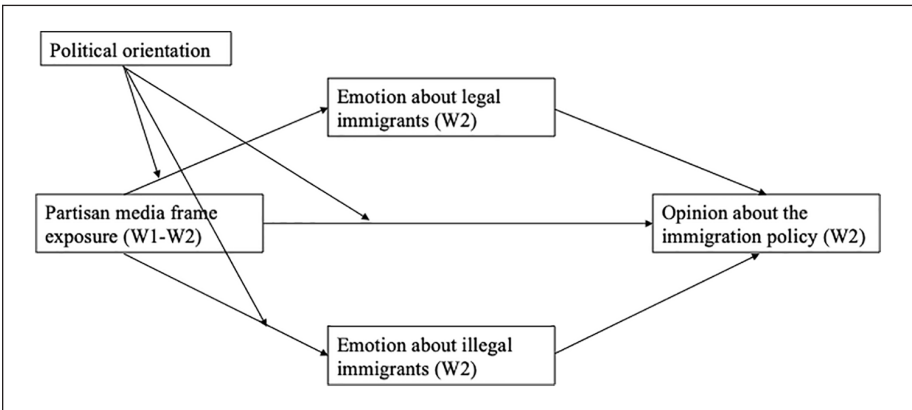**Figure 1.** Mainstream media exposure, emotion, and opinion.

Figure 2. Partisan media exposure, emotion, and opinion.

(Figure 2). For both models, emotions toward legal and illegal immigrants were entered as mediating variables simultaneously. 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).

Results

H1-3 and RQ1-2 asked about the effects of mainstream media (see Supplemental Table A3). Results show that individuals who were more frequently exposed to the mainstream media's immigration coverage with the frames of *economy* ($B=-7.44$, $p<.01$), *politics* ($B=-0.53$, $p<.05$), *regulation* ($B=-3.13$, $p<.01$), *culture* ($B=-1.03$, $p<.05$), *family* ($B=-2.38$, $p<.01$), and *public opinion* ($B=-1.06$, $p<.05$) were more likely to support a stricter immigration policy. H1 was supported with

considerable evidence. In answering RQ1, results show that exposure to only certain frames—not *crime* and *wellbeing*—affects opinion. However, the mainstream media would not influence the public's emotions toward immigrants (H2, RQ2). Neither did the media have any indirect influence on the opinion (H3).

Turning to partisan media (see Supplemental Table A4), results show that cumulative exposure to only one frame—the *crime* frame ($B=-1.42, p<.05$)—in the conservative media made all believe the immigration policy should be stricter (H4a, RQ3a). However, conservative media would not influence the public's emotions toward immigrants, legal, or illegal (H4b, RQ3b).

For liberal media, a direct association between media exposure and opinion change was not found (H5a, RQ4a). On the other hand, cumulative exposure to all news frames of immigration in liberal media would make all feel more positive toward illegal immigrants. H5b was supported in relation to illegal immigrants. In answering RQ4b, results show that the content of news frames would not matter. The pattern does not apply to legal immigrants.

When it comes to the framing effects of partisan media on audiences of different political orientations, results show that the direct association between partisan media exposure and opinion was not moderated by political orientation (RQ5-6).

In answering RQ7, cumulative exposure to conservative media's immigration coverage with frames of the *economy* and *public opinion* would make liberals feel more negative toward illegal immigrants. On the other hand, political orientation did not matter for the effect of liberal media on audiences' emotions (RQ8).

RQ9-10 asked about whether the indirect effect of partisan media exposure on opinion would be moderated by political orientation. PROCESS reports specific data at the sixteenth, fiftieth, and eighty-fourth percentiles, and in our study, the sixteenth, fiftieth, and eighty-fourth percentiles are two (liberals), five (neutrals), and eight (conservatives) on the political orientation scale (see Supplemental Table A4). Results show that, after being exposed to conservative news coverage of immigration with frames of *economy, crime, public opinion*, and *culture* over time, liberals would feel more negative toward illegal immigrants and, in turn, they would be more likely to support a stricter immigration policy. Similarly, frequent exposure to conservative media's *regulation* and *culture* frames would elicit a less favorable emotion toward legal immigrants among liberals, who would then develop a less favorable opinion about immigration. On the other hand, cumulative exposure to liberal media's immigration coverage would make all feel less negative toward illegal immigrants and support a relatively less strict immigration policy. See Table 1 for a summary of findings and Supplemental Tables A5 and A6 for additional statistics.

Discussion

This study examines how the news framing of immigration influences the public's emotions toward immigrants and their preference for immigration policy. Combining a computational media content analysis and a two-wave panel survey, the findings of this research demonstrate that cumulative exposure to news frames from both

Table 1. A Summary of Research Findings.

Media	Direct effect			Indirect effect	
	Emotion—legal	Emotion—illegal	Opinion	Emotion—legal	Emotion—illegal
Mains. Media			Economy (-) Politics (-) Legislation (-) Culture (-) Family (-) Opinion (-)		
Conserv. media					
→All citizens			Crime (-)		
→Liberals		Economy (-) Opinion (-)		Legislation (-) Culture (-)	Economy (-) Crime (-) Opinion (-) Culture (-)
Liberal media					
→All citizens		All frames (+)			All frames (+)

mainstream and partisan media has significant effects in a real election context. In particular, we found that while exposure to certain frames in the mainstream media directly leads to public support for a stricter immigration policy, partisan media tend to affect public opinion indirectly by influencing emotions toward immigrants in opposite directions.

Specifically, the research reveals that exposure to several news frames of immigration in the mainstream media (i.e., *economy, politics, regulation, culture, family*, and *public opinion*) and exposure to the *crime* frame in the conservative media for a few weeks make one prefer a stricter immigration policy. These findings, first, illustrate the anti-immigration rhetoric advanced by the Trump administration at the time of research. For example, scholars have discovered that not only conservative media but also mainstream ones echoed Trump's language, such as the use of the derogatory term "chain migration," to refer to family reunification (Alamillo et al. 2019). Our research reveals that such discourse (e.g., the *family* frame) did have an impact on public opinion. Theoretically, the findings speak to the frame's applicability mechanism and indicate that the type of media outlets matters for understanding this mechanism. While mainstream media can shape the audience's opinion by covering immigration through many different angles, the *crime* frame is the only frame that conservative media can use to directly solicit an anti-immigration opinion. Given the conservative media's political position and their focus on illegal immigration, the media may be especially powerful in attaching the crime consideration to the audience's interpretation of the immigration issue.

More importantly, our research demonstrates the accessibility effect of framing. That is, the amount of news exposure matters because individuals who are more frequently exposed to certain news frames are more likely to be influenced. The framing

effect is clear and pronounced even considering that individuals are exposed to different and sometimes competing frames from diverse news sources (see Supplemental Table A7). The findings offer insight into the ongoing discussion on whether we have entered an era of minimal media effects (Bennett and Iyengar 2008; Shehata and Strömbäck 2013), and our answer is "not yet."

In addition, our research shows that the effect of news framing on opinion can also occur by influencing emotions. Remarkably, this indirect effect only applies to conservative media and their effects on liberals. This finding confirms that while news media have always had emotional appeals, partisan media are an extension of this trend (Hasell and Weeks 2016; Wojcieszak et al. 2016). Specifically, partisan media are effective in directing emotions toward specific targets (Zhu et al. 2021). Our research reveals that different frames in the conservative media interact with the respondents' emotions toward legal and illegal immigrants, respectively. Exposure to the *economy, crime, public opinion*, and *culture* frames would make liberals feel more negatively toward illegal immigrants, and emphasizing *regulation* as well as *culture* would induce a less favorable emotion toward legal immigrants, both leading to support for a stricter immigration policy. It is not surprising to see the conservative media provoking negative emotions toward illegal immigrants, activating the audiences' thoughts related to negative considerations such as *crime* and the *economy*. Yet, it is noteworthy that the media can also stimulate negative emotions toward legal immigrants by discussing immigration-related *regulations* and the influence of immigration on *culture*. This finding, again, may reflect the anti-immigration campaign launched by former President Trump, who made great efforts to not only target problems of illegal immigration but also to reduce the number of legal immigrants through a series of policies and executive actions. Our research adds that conservative media serve to reinforce and amplify anti-immigrant emotions through their affective influence. Given the interaction between emotion and cognition, it is alarming that the partisan framing effect may facilitate the illogical processing of information, promote partisan bias, and even make room for misinformation.

Our findings about the conservative media's sole impact on liberals are also important in pointing out that a certain mechanism of cross-cutting exposure, rather than that of selective exposure/perception, is more effective. It is likely that conservatives are firmly negative toward the immigration issue and are familiar with the framing of conservative media. Any further exposure would not make their thoughts and emotions more negative. On the other hand, liberals are usually more conflicted on the topic (Lahav and Courtemanche 2012)—neither positive nor negative toward the immigration policy and illegal immigrants in our case, and exposure to competing viewpoints will make them even more ambivalent about their prior emotions (Mutz 2006). They, therefore, tend to be more responsive to the framing effects. See Supplemental Table A5 for additional statistics.

On the other hand, it appears that any exposure to liberal media would make people feel less negative toward illegal immigrants and, in turn, induce a more pro-immigration opinion. In addition, the effects are significant across the board regardless of the audiences' political orientation. These findings suggest that the effects come from

liberal media exposure in general, rather than from any of the news frames or the mechanisms of selective and cross-cutting exposures. This is reasonable given the liberal media's long-standing position to advocate for a more relaxed immigration policy, but our research seems to suggest their efforts have mainly focused on illegal immigration.

Together, the findings indicate that framing effects not only depend on the specific frame but also on the type of media under discussion. Exposure to the same frame, such as *crime*, through mainstream, conservative, and liberal media outlets will yield distinct effects on the emotions and opinions of individuals based on their respective political orientations. This suggests that sources of information provide an important cue to trigger biased processing of the media content (Gunther et al. 2017; Reid 2012). In addition to the unique effect of partisan media discussed above, there is a possibility that different media outlets employ divergent narratives and tones when applying specific frames. Future research should consider adopting a more nuanced approach to framing analysis and delving deeper into the interaction between media and frame.

To conclude, our research provides empirical support for the cumulative effect of news framing and suggests that mainstream and partisan media influence the public's opinion on immigration policy by way of different psychological mechanisms. As expected, conservative and liberal media are able to shape the public's emotions toward immigrants and their policy preferences in different directions, shedding light on the polarization of the current media landscape. In addition, our research provides empirical support for the concern that anti-immigration rhetoric seems to be more mainstream in U.S. society. Theoretically, this study makes meaningful contributions to the literature by suggesting that (1) it is important to consider the amount of exposure when assessing the framing effects and (2) the strength and direction of the effects should vary by the media. Methodologically, the combination of a computational analysis and a two-wave survey makes it possible to examine cumulative framing effects and consider the respondents' diverse media diets in a high-choice media environment. Although our approach is not the strongest in inferring causality, our results are more externally valid compared with those of prior experiments.

This research has a few limitations. First, while we provide evidence for causal inference through an autoregression analysis of a two-wave survey, readers should take caution to conclude causality given the limitations of survey research. Second, the study may have a multiple-hypothesis testing problem though all the hypotheses and research questions are theory-driven. Third, the measurement of frame exposure is an estimation and it does not consider the quality of the actual exposure. Our work also suggests a few future research directions. As our approach examines the unique effect of each frame, future research could explore the interaction between two or more frames. Second, given that self-reported emotions reflect individuals' subjective experiences, future research may consider tracking emotions as physiological and behavioral responses over time as complements. Combining the methodological approach presented here and the experimental method is another promising research direction. Third, future research could also consider examining the effect of each specific media outlet instead of grouping them into arbitrary categories. It is also important to

investigate the framing effects of more media outlets beyond the ones analyzed here and compare the effects of online and offline media. Fourth, a curvilinear relationship between frame exposure and outcome variables is possible and is worth further examination. Finally, it is imperative to examine the news frames related to immigrants from diverse ethnicities and countries and the corresponding framing effects.

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Supplemental Material

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References

Ackerman, E. F. 2013. The rise of the 'illegal alien'. *Contexts*, 12(3): 72–74.

Ahn, H. M., S. A. Kim, I. J. Hwang, J. W. Jeong, H. T. Kim, S. Hamann, and S. H. Kim. 2015. "The Effect of Cognitive Reappraisal on Long-Term Emotional Experience and Emotional Memory." *Journal of Neuropsychology* 9(1):64–76.

Alexa. 2018. "The top 500 Sites on the Web—Subcategory 'Breaking News'." https://www.alexa.com/topsites/category/Top/News/Breaking_News.

AllSides. n.d. "AllSides Media Bias Chart." https://www.allsides.com/media-bias/media-bias-chart.

Al-Rawi, A. 2017. "News Values on Social Media: News Organizations' Facebook Use." *Journalism* 18(7):871–89.

Alamillo, R., C. Haynes, and R. Madrid Jr. 2019. "Framing and Immigration Through the Trump Era." *Sociology Compass* 13(5):e12676.

Bennett, W. L., and S. Iyengar. 2008. "A New Era of Minimal Effects? The Changing Foundations of Political Communication." *Journal of Communication* 58(4):707–31.

Benson, R. 2013. *Shaping Immigration News: A French-American Comparison*. Cambridge: Cambridge University Press.

Bos, L., S. Lecheler, M. Mewafi, and R. Vliegenthart. 2016. "It's the Frame that Matters: Immigrant Integration and Media Framing Effects in the Netherlands." *International Journal of Intercultural Relations* 55:97–108.

Boydstun, A. E., D. Card, J. Gross, P. Resnick, and N. A. Smith. 2014. "Tracking the Development of Media Frames Within and Across Policy Issues." Working Paper.

Cappella, J. N., and Jamieson, K. H. 1997. *Spiral of Cynicism: The Press and the Public Good*. Oxford: Oxford University Press.

Card, D., S. Chang, C. Becker, J. Mendelsohn, R. Voigt, L. Boustan, R. Abramitzky, and D. Jurafsky. 2022. "Computational Analysis of 140 Years of US Political Speeches Reveals More Positive But Increasingly Polarized Framing of Immigration." *Proceedings of the National Academy of Sciences of the United States of America* 119(31):e2120510119.

Chen, H. T., L. Guo, and C. C. Su. 2020. "Network Agenda Setting, Partisan Selective Exposure, and Opinion Repertoire: The Effects of Pro-and Counter-Attitudinal Media in Hong Kong. *Journal of Communication* 70(1):35–59.

Chen, Z., C. C. Su, and A. Chen. 2019. Top-down or Bottom-up? A Network Agenda-Setting Study of Chinese Nationalism on Social Media. *Journal of Broadcasting & Electronic Media* 63(3):512–33.

Chong, D., and J. N. Druckman. 2010. "Dynamic Public Opinion: Communication Effects Over Time." *American Political Science Review* 104(4):663–680.

D'angelo, P. 2002. News Framing as a Multiparadigmatic Research Program: A Response to Entman. *Journal of Communication* 52(4):870–88.

Davlin, J., M. W. Chang, K. Lee, and K. Toutanova. 2018. "Bert: Pre-training of Deep Bidirectional Transformers for Language Understanding." arXiv preprint arXiv:1810.04805.

de Hoog, N., and P. Verboon. 2020. "Is the News Making Us Unhappy? The Influence of Daily News Exposure on Emotional States." *British Journal of Psychology* 111(2): 157–173.

De Vreese, C. H. 2005. "News Framing: Theory and Typology." *Information Design Journal+ Document Design* 13(1): 51–62.

Druckman, J. N., J. Fein, and T. J. Leeper. 2012. "A Source of Bias in Public Opinion Stability." *American Political Science Review* 106(2): 430–454.

Druckman, J. N., E. Peterson, and R. Slothuus. 2013. "How Elite Partisan Polarization Affects Public Opinion Formation." *American Political Science Review* 107(1):57–79.

Eberl, J. M., C. E. Meltzer, T. Heidenreich, B. Herrero, N. Theorin, F. Lind, R. Berganza, H. G. Boomgaarden, C. Schemer, and J. Strömbäck. 2018. "The European Media Discourse on Immigration and Its Effects: A Literature Review." *Annals of the International Communication Association* 42(3):207–23.

Edgerly, S. 2015. "Red Media, Blue Media, and Purple Media: News Repertoires in the Colorful Media Landscape." *Journal of Broadcasting & Electronic Media* 59(1):1–21.

Ekman, P. 2007. *Emotions Revealed*. New York: Owl Books.

Entman, R. M. 1993. "Framing—Toward Clarification of a Fractured Paradigm." *Journal of Communication* 43(4):51–8.

Freedman, J. L., and D. O. Sears. 1965. "Selective Exposure." *Advances in Experimental Social Psychology* 2:57–97.

Fryberg, S. A., Stephens N. M., Covarrubias, R., et al. 2012. "How the Media Frames the Immigration Debate: The Critical Role of Location and Politics." *Analyses of Social Issues and Public Policy* 12(1): 96–112.

Greussing, E., and H. G. Boomgaarden. 2017. "Shifting the Refugee Narrative? An Automated Frame Analysis of Europe's 2015 Refugee Crisis. *Journal of Ethnic and Migration Studies* 43(11):1749–74.

Grimm, J., and J. L. Andsager. 2011 "Framing Immigration: Geo-ethnic Context in California Newspapers." *Journalism & Mass Communication Quarterly* 88(4): 771–88.

Gunther, A. C., B. McLaughlin, M. R. Gotlieb, and D. Wise. 2017. "Who Says What to Whom: Content Versus Source in the Hostile Media Effect." *International Journal of Public Opinion Research* 29(3):363–83.

Guo, L., K. K. Mays, Y. Zhang Y, D. Wijaya, and M. Betke. 2021. "What Makes Gun Violence a (Less) Prominent Issue? A Computational Analysis of Compelling Arguments and Selective Agenda Setting." *Mass Communication & Society* 24(5): 651–75.

Hasell, A., and B. E. Weeks. 2016. "Partisan Provocation: The Role of Partisan News Use and Emotional Responses in Political Information Sharing in Social Media. *Human Communication Research* 42(4): 641–661.

Hayes, A. F. 2022. *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. 3rd Edition. New York, NY: Guilford Publications.

Haynes, C., J. Merolla, and S. K. Ramakrishnan. 2016. *Framing Immigrants: News Coverage, Public Opinion, and Policy*. New York: Russell Sage Foundation.

Igartua, J.-J., F. Moral-Toranzo, and I. Fernández. 2011. "Cognitive, Attitudinal, and Emotional Effects of News Frame and Group Cues, on Processing News About Immigration." *Journal of Media Psychology: Theories, Methods, and Applications* 23(4): 174.

Knobloch-Westerwick, S., and J. Meng. 2011. "Reinforcement of the Political Self Through Selective Exposure to Political Messages." *Journal of Communication* 61(2):349–68.

Kühne, R., and C. Schemer. 2015. "The Emotional Effects of News Frames on Information Processing and Opinion Formation." *Communication Research* 42(3):387–407.

Lahav, G., and M. Courtemanche. 2012. "The Ideological Effects of Framing Threat on Immigration and Civil Liberties." *Political Behavior* 34(3):477–505.

Lang, A., K. Dhillon, and Q. Dong. 1995. "The Effects of Emotional Arousal and Valence on Television Viewers' Cognitive Capacity and Memory." *Journal of Broadcasting & Electronic Media* 39(3):313–27.

Lazarus, R. S. 1991a. "Cognition and Motivation in Emotion." *American Psychologist* 46(4):352.

Lazarus, R. S. 1991b. *Emotion and Adaptation*. Oxford: Oxford University Press.

Lazarus, R. S., and S. Folkman. 1984. *Stress, Appraisal, and Coping*. New York: Springer Publishing Company.

Lecheler, S., and C. H. De Vreese. 2016. "How Long Do News Framing Effects Last? A Systematic Review of Longitudinal Studies. *Annals of the International Communication Association* 40(1): 3–30.

Lecheler, S., and C. H. De Vreese. 2019. *News Framing Effects: Theory and Practice*. London: Taylor & Francis.

Lecheler, S., L. Bos, and R. Vliegenthart. 2015. "The Mediating Role of Emotions: News Framing Effects on Opinions About Immigration." *Journalism & Mass Communication Quarterly* 92(4):812–38.

Levendusky, M. 2013. *How Partisan Media Polarize America*. Chicago: The University of Chicago Press.

Liu, S., L. Guo, K. Mays, M. Betke, and D. T. Wijaya. 2019. "Detecting Frames in News Headlines and Its Application to Analyzing News Framing Trends Surrounding US Gun Violence." In *Proceedings of the 23rd Conference on Computational Natural Language Learning (CoNLL)*, 504–514. Association for Computational Linguistics.

Mauss, I. B., and M. D. Robinson. 2009. "Measures of Emotion: A Review." *Cognition and Emotion* 23(2):209–37.

Mendelsohn, J., C. Budak, and D. Jurgens. 2021. "Modeling Framing in Immigration Discourse on Social Media." In *Proceedings of the 2021 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies*, 2219–63. Association for Computational Linguistics.

Merolla, J., S. K. Ramakrishnan, and C. Haynes. 2013. "'Illegal,' 'undocumented,' or 'unauthorized': Equivalency Frames, Issue Frames, and Public Opinion on Immigration." *Perspectives on Politics* 11(3):789–807.

Mitchell, A., J. Gottfried, J. Kiley, and K. E. Matsa. 2014. "Political Polarization & Media Habits." Pew Research Center. https://www.pewresearch.org/journalism/2014/10/21/political-polarization-media-habits/.

Mutz, D. C. 2002. "Cross-cutting Social Networks: Testing Democratic Theory in Practice." *American Political Science Review* 96(1):111–26.

Mutz, D. C. 2006. *Hearing the Other Side: Deliberative Versus Participatory Democracy*. Cambridge: Cambridge University Press.

Nabi, R. L. 2009. "Emotion and Persuasion: A Social Cognitive Perspective." In: *Communication and Social Cognition*, ed. R. L. Nabi, 389–410. London: Routledge.

Pew Research Center. 2018a. "Shifting Public Views on Legal Immigration into the U.S." https://www.pewresearch.org/politics/2018/06/28/shifting-public-views-on-legal-immigration-into-the-u-s/.

Pew Research Center. 2018b. "State of the News Media Methodology." http://www.journalism.org/2018/07/25/state-of-the-news-media-methodology/.

Price, V., and D. Tewksbury. 1997. "News Values and Public Opinion: A Theoretical Account of Media Priming and Framing." In *Progress in Communication Sciences: Advances in Persuasion*, eds. G. A. Barett and F. J. Boster, 173–212. Greenwich, CT: Ablex.

Quinsaat, S. 2014. "Competing News Frames and Hegemonic Discourses in the Construction of Contemporary Immigration and Immigrants in the United States." *Mass Communication and Society* 17(4): 573–96.

Reid, S. A. 2012. "A Self-Categorization Explanation for the Hostile Media Effect." *Journal of Communication* 62(3):381–99.

Rössler, P. 1999. "The Individual Agenda-Designing Process: How Interpersonal Communication, Egocentric Networks, and Mass Media Shape the Perception of Political Issues by Individuals. *Communication Research* 26(6):666–700.

Schmitt, K. M., A. C. Gunther, and J. L. Liebhart. 2004. "Why Partisans See Mass Media as Biased. *Communication Research* 31(6):623–41.

Semetko, H. A., and P. M. Valkenburg. 2000. "Framing European Politics: A Content Analysis of Press and Television News." *Journal of Communication* 50(2):93–109.

Shehata, A., and J. Strömbäck. 2013. "Not (yet) a New Era of Minimal Effects: A Study of Agenda Setting at the Aggregate and Individual Levels. *International Journal of Press/Politics* 18(2):234–55.

Statista. 2018. "Most Popular News Websites as of May 2018, By Unique Monthly Visitors." https://www.statista.com/statistics/381569/leading-news-and-media-sites-usa-by-share-of-visits/.

Stroud, N. J. 2011. *Niche News: The Politics of News Choice*. Oxford: Oxford University Press on Demand.

Sun, X., and Y. L. Cheung. 2022. "Portrayal of China in Online News Headlines: A Framing and Syntactic Analysis." *Journalism Studies* 23:2015–2037.

Taber, C. S., and M. Lodge. 2006. "Motivated Skepticism in the Evaluation of Political Beliefs." *American Journal of Political Science* 50(3): 755–69.

Tankard, J. W., L. Hendrickson, J. Silberman, K. Bliss, and S. Ghanem. 1991. "Media Frames: Approaches to Conceptualization and Measurement." In *The Association for Education*

in Journalism and Mass Communication annual Conference, Boston, Massachusetts, Association for Education in Journalism and Mass Communication.

Tewksbury, D., and D. A. Scheufele. 2019. "News Framing Theory and Research." In *Media Effects*, eds. M. B. Oliver, A. A. Raney and J. Bryant, 51–68. London: Routledge.

Theorin, N., C. E. Meltzer, S. Galyga, J. Strömbäck, C. Schemer, J. M. Eberl, F. Lind, T. Heidenreich, and Boomgaarden, H. G. 2021. "Does News Frame Affect Free Movement Attitudes? A Comparative Analysis." *Journalism & Mass Communication Quarterly* 98(3): 725–48.

Tourni, I., L. Guo, T. H. Daryanto, F. Zhafransyah, E. E. Halim, M. Jalal, B. Chen, S. Lai, H. Hu, M. Betke, P. Ishwar, and Wijaya, D. T. 2021. "Detecting Frames in News Headlines and Lead Images in US Gun Violence Coverage." In *Findings of the Association for Computational Linguistics: EMNLP* 2021, 4037–50. Association for Computational Linguistics.

Van Gorp, B. 2005. "Where Is the Frame? Victims and Intruders in the Belgian Press Coverage of the Asylum Issue." *European Journal of Communication* 20(4):484–507.

Wojcieszak, M., B. Bimber, L. Feldman, and N. J. Stroud. 2016. Partisan news and political participation: Exploring mediated relationships. *Political Communication* 33(2): 241–60.

Wojcieszak, M. E., and D. C. Mutz. 2009. "Online Groups and Political Discourse: Do Online Discussion Spaces Facilitate Exposure to Political Disagreement? *Journal of Communication* 59(1):40–56.

Zhang, Y. 2021. "'What I Tweet is Not What I Think': Towards a Comprehensive Multi-Version Two-way Agenda-setting Framework." Doctoral dissertation, Boston University.

Zhu, Q., B. E. Weeks, and N. Kwak. 2021. "Implications of Online Incidental and Selective Exposure for Political Emotions: Affective Polarization During Elections." *New Media & Society*. Published online December 7. doi:10.1177/14614448211061336.

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