When We Have to Get Along: Depolarizing Impacts of
Cross-Cutting Social Media

DANIEL J. SUDE[♦]
George Washington University, USA

SILVIA KNOBLOCH-WESTERWICK
Technische Universität Berlin, Germany

Drawing upon spiral of silence theory and Brewer's extension of social identity theory, an online experiment with adult Republican and Democrat participants ($N = 407$) found that the less favorable a national opinion climate Americans perceived, the warmer they felt toward out-group partisans. Addressing media effects, when these partisans browsed an online forum, in which they were in the minority (versus the majority), they tended to perceive a less favorable national opinion climate and in turn to report warmer attitudes toward out-group partisans, as observed in an indirect effects model examining change in the key variables. To ensure external validity, the forum used stimuli harvested from a complete corpus of Reddit posts collected between 2016 and 2018, with a sampling technique incorporating latent space modeling.

Keywords: opinion climate, affective polarization, social media

Western democracies are experiencing heightened political polarization (Gidron, Adams, & Horne, 2019) characterized in particular by affective polarization—favorable attitudes toward one's own political party and unfavorable, even hostile, attitudes toward rival political parties (Iyengar, Sood, & Lelkes, 2012). Affective polarization reflects differences, both actual and perceived, in political attitudes. However, it also transcends politics, with the relationship between ideological and affective polarization being hotly debated (Dias & Lelkes, 2022; Webster & Abramowitz, 2017). Whatever its relationship with ideology, affective polarization impacts daily life, as it is associated with a desire for social distance from partisan rivals (Druckman & Levendusky, 2019). Such desire for distance can fracture society (e.g., DellaPosta, 2020) and affect everyday domains including dating (Huber & Malhotra, 2017) and employment (McConnell, Margalit, Malhotra, & Levendusky, 2018). Using real-world stimuli from Reddit, the current study investigates social factors, in particular, perceptions of public opinion, which influence affective polarization.

In the bulk of the literature, affective polarization is portrayed as the product of intergroup conflict and partisan identity (e.g., Druckman, Gubitz, Lloyd, & Levendusky, 2019; Gervais, 2019; Hernández,

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Daniel J. Sude: daniel.sude@gwu.edu
Silvia Knobloch-Westerwick: knobloch-westerwick@tu-berlin.de
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Anduiza, & Rico, 2021; Iyengar et al., 2012; Skytte, 2021; Suhay, Bello-Pardo, & Maurer, 2018). The current study takes an alternative, yet complementary, approach by integrating spiral of silence theory (Noelle-Neumann, 1974) and Brewer's (1999) extension of social identity theory. It argues that citizens of democracies, on average, are not content to be bitter partisans in constant political and social conflict with an implacable foe. If victory is at all in doubt, people should be motivated to seek psychological alternatives to conflict and thus become willing to see the other side in a more positive light.

The current study builds upon scant prior research (Tsfati & Chotiner, 2016) examining the influence of perceptions of public opinion on affective polarization. It also grounds itself in the more extensive literature examining public opinion and ideological (de)polarization (Lee, Jang, & Chung, 2021; Neubaum & Krämer, 2017; Sude, Knobloch-Westerwick, Robinson, & Westerwick, 2019; Westerwick, Sude, Robinson, & Knobloch-Westerwick, 2020). The argument for taking into account public opinion perceptions is straightforward: When the partisan in-group is relatively large, people can insulate themselves against social and political conflict; when the in-group is relatively small, they must instead manage this conflict.

To make this argument, aspects of spiral of silence theory and Brewer's (1999) theorizing relevant to depolarization are reviewed, along with supporting empirical evidence, allowing hypotheses to be derived. These are then tested in a custom-programmed social media context, using a large sample of Reddit stimuli identified via latent space modeling, presented to participants on a custom designed online forum using an experimental design.

Spiral of Silence Theory and Public Opinion as Social Control

Noelle-Neumann's (1974, 1993) spiral of silence theory has been the object of communication research for decades (see meta-analyses by Matthes, Knoll, & von Sikorski, 2018; Shanahan, Glynn, & Hayes, 2007). However, much of this research focused on whether people choose to express their opinions, an outcome of the titular spiral of silence process. The current analysis, in contrast, turns to the larger theoretical framework from which Noelle-Neumann (1974, 1993; Noelle-Neumann & Petersen, 2004) derived predictions. Specifically, it examines the theory's analysis of public opinion as a source of social control. From this perspective, people accommodate perceived publics through (a) behavioral changes, such as self-silencing, and (b) psychological changes, such as attitude change. The latter is our focus.

Spiral of silence theory can provide insight beyond other popular theories regarding antidotes to political polarization. While the Common In-group Identity Model allows for partisan identities to be nested within the broader American identity, attempts to leverage this overarching identity to overcome polarization have seen limited success (e.g., Knobloch-Westerwick, Mothes, & Polavin, 2020; Levendusky, 2018; Wojcieszak & Garrett, 2018; Wojcieszak, Winter, & Yu, 2020). Merely evoking a common identity appears insufficient to transcend political intergroup conflict. In contrast, spiral of silence theory offers an analysis framed not in terms of simple identification, but rather the practical requirements of social life in a polarized society.

The current section reviews arguments of spiral of silence theory that predict psychological conformity in response to perceived public opinion and describes empirical tests. Noelle-Neumann (1993) asserted that all individuals fear social isolation, quoting de Tocqueville's statement that individuals "dread

isolation more than error" (as cited in Noelle-Neumann, 1993, p. x) and highlighting Locke's sentiment that "not one person in ten thousand is callous enough not to care if the social environment withholds its approval" (as cited in Noelle-Neumann, 1993, p. x). Spiral of silence theory emphasizes the lengths to which people go to avoid becoming social pariahs, including refraining from expressing views (being silent) and changing views to conform to prevailing opinions.

First, Noelle-Neumann (1977, 1993) argued that people make inferences about the distribution of opinions within a society from a range of sources—including both interpersonal encounters and the mass media—an estimation process labeled by spiral of silence theory as the quasi-statistical sense. Inferences about opinion distributions can create an impression of a favorable, unfavorable, or uncertain *opinion climate* (Noelle-Neumann, 1977), as reviewed next. Contemporary researchers have demonstrated that impressions of public opinion are indeed impacted by a range of opinion cues from both the mass media (e.g., Garrett, Dvir-Gvirsman, Johnson, Tsfati, Neo, & Dal, 2014; Tsfati, Stroud, & Chotiner, 2014; Zerback, Koch, & Krämer, 2015) and social media (e.g., Gearhart & Zhang, 2014; Neubaum & Krämer, 2017). Exemplification, the often automatic process by which people infer information about the whole from their recent experience with its parts (Zillmann, Gibson, Sundar, & Perkins, 1996), has been identified as a key psychological mechanism, along with other factors, such as projection (Dvir-Gvirsman, 2015). Drawing upon this body of research, H1 is thus derived:

H1:   Being in a political minority (versus majority) on a social media platform leads to estimating a less favorable national opinion climate.

Regarding the opinion climate, Noelle-Neumann (1974) developed a nuanced set of arguments defining the concept. Initially, Noelle-Neumann emphasized that mere uncertainty of being in the majority could drive conformity, due to the associated risk of hostile social encounters. Later, Noelle-Neumann emphasized that perceptions of the extent of public support or opposition matter *only* in so far as they have social implications (Noelle-Neumann & Petersen, 2004). For example, one can be in the numerical minority but not fear isolation if one's in-group is sufficiently large to provide a social buffer (Noelle-Neumann, 1974). In other words, the psychological importance of the opinion climate is caused by perceptions of social risk, and these perceptions are imperfectly indexed by numerical estimates (Noelle-Neumann & Petersen, 2004). Studies have found spiral of silence theory-aligned impacts from many measures of opinion climate, including continuous numerical measures, general impression-based measures (e.g., Wang, Hmielowski, Hutchens, & Beam, 2017), and simpler majority vs. minority dichotomies. An extensive meta-analysis of 27,000 participants across 66 studies (Matthes et al., 2018) found that the persistent impact of opinion climate perceptions on self-silencing was of similar magnitude across different operationalizations. In the current study, because of its focus on intergroup relations, opinion climate is operationalized in terms of national support for Democrats and Republicans, respectively.

Last, Noelle-Neumann (1974) specifically addressed psychological adaptation to the perceived opinion climate, theorizing that any lack of "self-assurance—[the] expectation of having the present or future majority on their side" promotes psychological conformity: "I hypothesize that, in the process of public opinion formation, observation of changes in the environment precedes changes in one's own opinion" (p. 49). Spiral of silence theory proposes that merely anticipating negative social encounters results in an

aversive state of embarrassment (Noelle-Neumann, 1993; Noelle-Neumann & Petersen, 2004). If the *mere thought* of expressing an opinion leads to embarrassment, spiral of silence theory predicts that people will shape their opinions to avoid this feeling. Note that while Noelle-Neumann's predictions regarding behavioral conformity (i.e., silence) have received support (Matthes et al., 2018), the nature of this psychological conformity is just beginning to be studied. The current analysis contributes to this emergent literature.

The bulk of this literature has focused on specific political policy attitudes. For example, Neubaum and Krämer (2017) used an experimental design manipulating content on a mock Facebook feed regarding both legalized euthanasia and adoption rights for same sex couples. When participants saw comments opposing their stance, they formed more moderate attitudes on the relevant topic if they perceived that fewer people agreed with them on that platform (a less favorably opinion climate). Notably, comments were carefully crafted to reflect only a strong, clear stance rather than a stance containing arguments or evidence. Encountering expressed opinions impacted participants' perceptions of whether other people would agree with them and in turn their own attitudes. Supporting Noelle-Neumann's theorizing, this impact was stronger among those who admitted to a fear of isolation.

Also employing an experimental manipulation of online comments, Lee and colleagues (2021) found parallel results focusing on a controversial strategy for winning speed skating competitions used during the 2018 Winter Olympics in South Korea. Once again, the researchers found an indirect effect of exposure to controversial content (comments on a news article describing the practice) on attitudes via perceptions of the favorability of the opinion climate.

Related work, framed from the perspective of impression management (building upon Chen, Schecter, & Chaiken, 1996), contrasted the impacts of negative versus positive comments concerning media coverage of suicide on a social media versus news site (Winter, 2019). Importantly, the manipulation simultaneously impacted perceptions of national public opinion and had aligned impacts on participants' own attitudes. In contrast to Winter's predictions, however, and relevant to spiral of silence theory, increased anticipation of interacting with others on the site did not magnify the impact of the manipulation on attitudes across the board. Instead, it heightened the impact of negative comments and diminished the impact of positive ones, suggesting that participants were particularly sensitive to social disapproval, which would be in line with Noelle-Neumann's general emphasis on social threat.

Two other studies took an observational approach, allowing participants to freely browse content and measuring impacts on issue-specific opinion climate perceptions and associated attitudes using a pre/post design. These studies specifically provided participants with choice since emergent research demonstrates that the mere act of choosing changes how individuals process political information (e.g., Stroud, Feldman, Wojcieszak, & Bimber, 2019). In one of these observational studies, Sude and colleagues (2019) found that people who spent time reading attitude-discrepant political content, across six political topics, developed a stronger impression that the opinion climate would shift against them and in turn reported more moderate political attitudes. Westerwick and colleagues (2020) found similar results for political content attributed to either professional journalists or everyday users. Notably, in the latter study, impacts on both opinion climate perceptions and attitudes persisted one day later.

Importantly, participants rarely "converted" to the other side in these observational studies that used selective exposure designs and inspired the current study. Rather, they reported a weaker attitude that, in turn, could allow them to lessen future social conflict, as the current analysis argues. Taken together with the fact that such weakening occurred even for highly controversial political issues with strong partisan associations (e.g., abortion, social welfare, and affirmative action), it seems unlikely that these participants were merely acquiescing to valued majority opinion. While this latter tendency has been observed in other work (Wood, Pool, Leck, & Purvis, 1996), much of that work examined contexts where the influential majority was self-relevant or otherwise socially valued. Neither of these conditions likely pertains to the context being investigated, in which participants encountered political views expressed by out-group partisan strangers online.

In summary, each of the studies above demonstrated that exposure (forced or voluntary) to expressed opinions impacted the perceived opinion climate accordingly and in turn influenced individuals' attitudes across a range of designs and topics. These findings may at first seem counterintuitive for a society with political intergroup conflict like in the United States. Would the social concerns described by spiral of silence theory even apply when people are hostile to the other side? Some accounts, for example, would predict antagonism. Brewer's (1999) extension of social identity theory argued that when two social groups are distinct but interdependent, as with political parties, this very interdependence can drive mutual antagonism. Unwilling to trust one another, and thus unwilling to risk cooperation, both sides grow increasingly frustrated, blaming one another for the stalemate.

However, Brewer (1999) also argued that in a modern democracy, group membership is relatively fluid, characterized by identity complexity arising from cross-cutting and superordinate identities. Thus, in modern democracies, there may be less incentive to cling to intense conflict. Instead, individuals can acknowledge out-group partisans as Americans, even while defining themselves as both distinct from and in conflict with them. Spiral of silence theory was primarily derived in a similar context, post-war German democracy.

In this modern democratic political context, the current analysis argues that people, on average, should be motivated to view a large out-group warmly to avoid feeling trapped in an intractable series of social conflicts. It is argued that being trapped in intractable conflict is undesirable for most people. When "the other side" makes up a relatively small segment of the population, this conflict is proportionately less important. However, when the "other side" is meaningfully large, a motivated reasoning process is postulated to occur (Kunda, 1990).

Arguments for the unpleasantness of social conflict can be derived not just from spiral of silence theory itself but also from empirical studies in social psychology: Social exclusion stings (at least to a degree; cf. Krill & Platek, 2009), whether enacted by a computer (Zadro, Williams, & Richardson, 2004) or by a member of a hated out-group (e.g., a member of the Klu Klux Klan; Gonsalkorale & Williams, 2007). To minimize this perceived threat, people should be motivated to form more optimistic impressions and report greater warmth toward their rivals. Note that the current analysis is focused explicitly on attitudes toward the out-group, rather than on in-group favoritism, which may contribute to affective polarization but reflects other unrelated psychological processes (Brewer, 1999).

Survey evidence from Israel illustrates that perceptions of the opinion climate influence affective polarization: Tsfati and Chotiner (2016) found that ideological media exposure impacted perceptions of public opinion—per specific "wedge" issues—and in turn impacted affective polarization. Affective polarization was defined both as the absolute difference in feeling toward the ideological in-group versus the ideological out-group and as a signed difference score. Notably, by either operationalization, effects on affective polarization were driven explicitly by perceptions of the issue-specific opinion climate, rather than the more cognitive measure of using arguments from the media in conversation. However, Tsfati and Chotiner (2016) did not distinguish in-group favoritism from out-group derogation, with the latter being the focus of the current analysis.

The current study, then, offers a novel test of the motivated reasoning process proposed here. H2 and H3 are derived.

H2:   Perceived favorability of the opinion climate and warmth (versus coldness) of attitudes toward rival partisans will be negatively associated (a) preexposure and (b) postexposure.

H3:   Estimating a less favorable national opinion climate due to finding oneself in the minority (versus the majority) per H1 leads to having more positive attitudes toward out-group partisans.

The current study tests these predictions in a social media browsing context, using an experimental manipulation and a large sample of real-world Reddit stimuli identified via latent space modeling (material adopted from Bond & Sweitzer, 2022). Thus, to the extent that they were assigned to the majority or the minority condition, Democrats and Republican participants browsed different stimuli. Given this, a research question is asked regarding the robustness of findings:

RQ1:   Will Democrats versus Republicans respond differently to the manipulation per H1 or the opinion climate per H3?

Methods

Overview

Participants (*N* = 427; 407 used in analyses), completed an online study. First, they completed questionnaires inquiring about their political attitudes, including measures of affective polarization and public opinion. Next, they were asked to browse an ostensible prototype social media site, with the option of creating their own username and, after browsing, posting to the site. The site emulated Reddit and displayed stimuli that originally appeared on that platform. On the site, participants randomly assigned to the minority condition saw nine posts by out-group partisans and three posts by in-group partisans, per selected topic. In the majority condition, this proportion was reversed. Participants had a total of six minutes to browse the social media site. They could select between pages covering eight different political topics (similar to subreddits) and, once a topic was selected, had two minutes to browse. Once the two minutes elapsed, participants were redirected to the overview page and could select a new topic. After six minutes elapsed, participants were automatically redirected to a page giving them the ostensible opportunity to post to one

of the topic pages on the site. Thus, each participant viewed posts covering three topics. Next, participants completed measures of perceptions of public opinion, affective polarization, distractor questionnaires, and demographics. All procedures were approved by an Institutional Review Board at the Ohio State University in the United States.

Participants

Four hundred and twenty-seven participants completed the study. However, of these, 20 failed a simple attention check based on the instructions for the social media site browsing period and were excluded from analyses. Of the 407 remaining participants, 54.3% identified as Democratic or leaning Democrat, 45.7% as Republican or leaning Republican. Note that true independents were not eligible to participate in the study and were screened out by Qualtrics. Participants ranged from 22 to 86 years old ($M = 63.99$, $SD = 10.94$); concerning gender and ethnicity, 40.8% identified as women and 59.2% as men; 91.9% identified as non-Hispanic White, 5.2% as Asian, 1.2% as African American, 0.7% as Native American, 0.2% as Hispanic/Latino, and 0.7 % as multiracial or "other." Concerning education, 17.9% reported having earned a high school degree, 12.5% a two-year college degree, 36.6% a bachelor's degree, 25.6% a master's degree, and 7.4% a doctorate or professional degree.

Procedure

An adult sample of American partisan participants (Republican or Democrat) was recruited through Qualtrics. After consenting to participate, they completed an initial set of baseline questionnaires. Participants estimated the percentage of Americans currently supporting the Democratic and Republican political parties and reported their attitudes toward the politicians and everyday followers of the Democratic and Republican parties using feeling thermometers. These measures were embedded amidst a series of additional distractor measures focused on more general political attitudes.

Then, participants were told that during the next portion of the study, they would "view a prototype of a social media site with user posts," have "a brief span of time to read posts," and ". . . be able to post your own messages to the site after browsing." They were further told, at the end of the browsing period, that the study would "automatically transition to the next tasks." Participants were then given a simple attention check regarding these instructions. The correct option was "Pick topics and read social media posts until questionnaires load automatically," and the incorrect responses were "Write an essay" and "Respond to a questionnaire." Only participants who passed this attention check were retained in these analyses ($N = 407$).

After passing the attention check, participants were directed to create a username and choose an avatar. A default username, "user36332," was provided, and participants had the option to change it. A default neutral avatar was provided. However, participants could change the avatar to either a picture of a red elephant or a blue donkey. See "Covariates" for descriptive statistics for those who opted out of the defaults.

After this, participants were directed to an overview screen on a social media site labeled *Compilation*, which mimicked the style of the highly popular site Reddit (see Figure 1). Participants could select between pages with forum posts covering different topics (emulating subreddits on Reddit). Upon selecting a subtopic, participants could browse posts that appeared on Reddit (see Figure 2 for an example). For details of how posts were selected, see "Stimulus" below. Upon selection, participants had two minutes to browse each topic and could spend a total of six minutes browsing across all topics. The topics were abortion, immigration, gun control, social welfare, trade policies, tax policies, universal healthcare, and climate change.
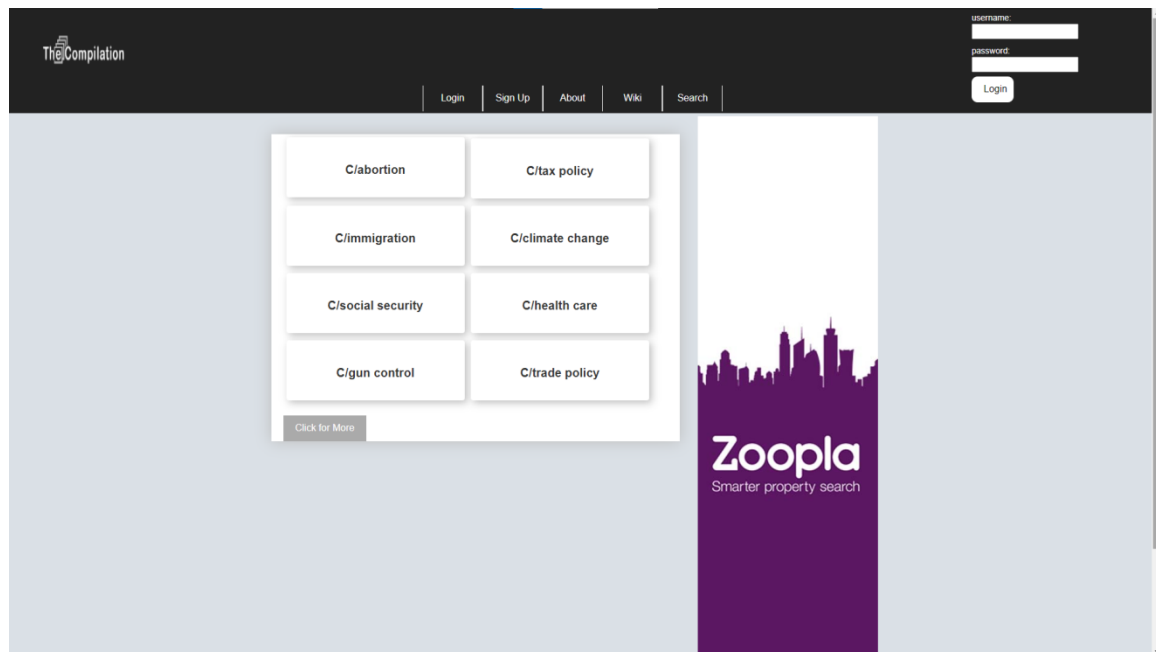

Figure 1. Overview page.

On each page, posts had a headline. Clicking the post led the participant to a specific page presenting the full content of the post. The variety of posts on each topic page was manipulated, depending on condition (see Figure 2). Participants who were assigned to the minority condition could view up to three posts on each topic with in-group partisan authors (indicated by a red elephant avatar for Republicans or a blue donkey avatar for Democrats) and nine posts with out-group partisan authors. In the majority condition, this proportion was reversed (nine in-group-partisans, three out-group partisans). This condition was constant across topics. For instance, a Democrat in the minority condition would see three posts by Democrats on trade policy or three posts by Democrats on abortion, depending on what topic they selected.
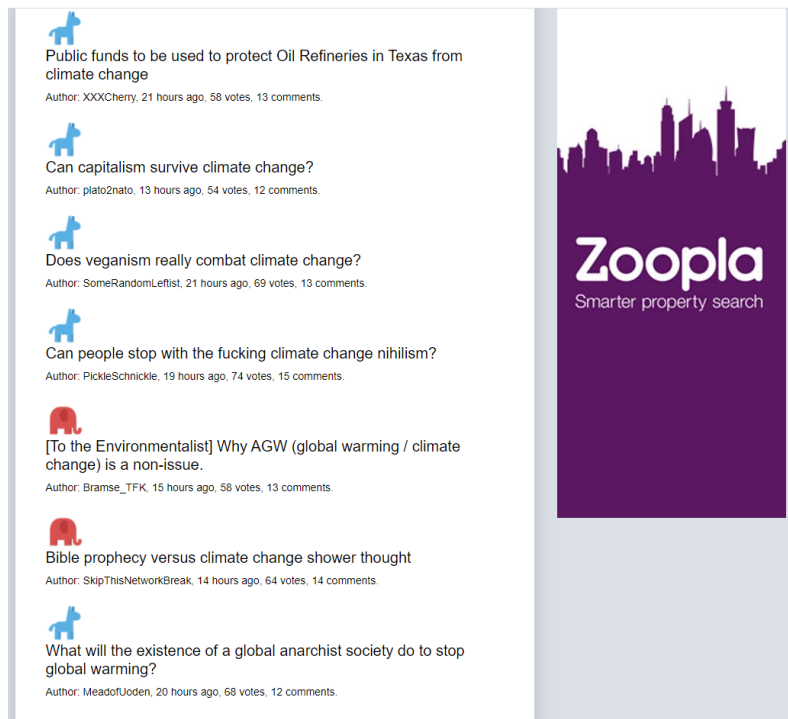
Figure 2. Topic page (climate change).

After the browsing period elapsed, participants were then given the ostensible option of posting their own comment on one or more of the topic pages. See "Covariates" for descriptive statistics. Upon either leaving a comment or refraining from commenting, participants continued on to complete post-browsing measures of their perceptions of the partisan opinion climate, feeling thermometer measures, and distractor items. Participants then completed additional demographic measures before exiting the study.

Manipulation and Stimuli

Minority Versus Majority Status

Participants could browse up to 12 posts per topic. Three of the posts were authored by Republicans (indicated via a red elephant avatar) or Democrats (indicated via a blue donkey avatar), nine by the opposing political party. By condition, participants could thus find themselves and their views in either the minority or the majority on that online forum. This condition was repeated per topic page, such that participants were either always in the majority or the minority.

Stimuli

Stimuli were borrowed from Bond and Sweitzer (2022). In summary, all posts were made to Reddit from January 1, 2016, to December 31, 2018. For the eight target topics (described under Overview above),

search queries were generated using keywords derived from Wikipedia pages associated with each topic. Content from 94 subreddits was then queried. The political ideology of users was estimated using latent space modeling based on the subreddits in which the user had posted. Eventually, from a pool of 9,274 posts with 10 or more words pertaining to one of the eight topics, a smaller corpus of 100 posts per topic (800 across topics) was derived, 50 on that topic written by the most liberal users and 50 by the most conservative users.

The social media site then displayed a random selection from each pool of 50 liberal or conservative posts, either three of the 50 or nine of the 50 depending on condition. Additionally, posts by liberal users were paired with the blue donkey avatar, and posts by conservative users with a red elephant. While the real username of the author was retained, other cues adopted from the Reddit style were randomized as follows: posting time within the range of 12 to 23 hours; votes within the range of 49 to 75, and number of comments within the range of 11–17.

Measures

Opinion Climate

Adapting a measure from Westerwick and colleagues (2020), participants answered questions about public support for the Democrat and Republican political parties both pre- and post-browsing the social media site. Participants were instructed, "Political party affiliations among Americans may often be diverse," and asked, "Please indicate what percentages of Americans currently affiliate with the political parties." Participants did so by positioning a slider between 0% and 100%.

Then, pre- and post-estimates were calculated for the partisan in-group and out-group respectively. A favorable opinion climate was calculated by subtracting the perceived percentage of out-group from the perceived percentage of in-group partisans, both pre-browsing ($M = 12.55$, $SD = 26.59$) and post-browsing ($M = 13.54$, $SD = 27.32$).

Affective Polarization and Partisan Animus

Before and after browsing, participants completed two feeling thermometers, each asking them to indicate "how you feel toward the political parties and partisans AT THIS MOMENT." The feeling thermometers could then be positioned between "very cold" and "very warm" for "Supporters and voters" of the Republican and Democratic parties, respectively. This measure was adapted from Iyengar and colleagues (2012), who in turn analyzed data from the American National Election Survey.

Participants reported warm attitudes toward everyday supports of their own parties both pre- ($M = 79.63$, $SD = 24.83$) and post-browsing (80.09, $SD = 23.96$) and cold attitudes toward everyday supporters of their rival party ($M = 16.99$, $SD = 23.16$; $M = 17.36$, $SD = 24.62$). The latter variable, attitude toward out-group partisans, is the focus of H2 and H3.

Covariates

Analyses were run excluding and including covariates to evaluate the robustness of the findings. Demographic covariates included age, education, gender, and status as Democrat or Republican, as described under "Participants," above. Additionally, partisan strength was included, and to calculate it, participants were first asked to identify as Democrat, Republican, or Independent. If Independent was selected, participants were then asked whether they leaned toward identifying as a Democrat or as a Republican. True independents were excluded automatically from this study. Participants who selected either Democrat or Republican were in turn asked to identify themselves as mild, moderate, or strong in partisanship. Together, these variables allowed a partisan strength variable to be estimated, from leaning, to mild, to moderate, to strong ($M = 2.92$, $SD = 1.15$). Additionally, participants were asked, "How closely do you generally follow the news about government and public affairs?" and responded on a scale from 1 to 9 ($M = 7.10$, $SD = 1.91$). Study-specific covariates were whether participants opted for a partisan versus neutral avatar (38.08%), whether participants created their own username (13.27%), and whether participants opted to post one or more comments (51.11%). Additionally, each subject of the three topic pages the participant browsed was included as a covariate (dummy-coded, with abortion as the reference group). Regarding topics, 37.0% of participants chose to read about abortion, 42.4% about climate change, 41.7% about gun control, 47.8% about healthcare, 35.5% about immigration, 53.9% about social security, 27.9% about tax policy, and 13.7% about trade policy.

Data Analysis

All models were executed using Hayes' (2018) PROCESS macro, using 5,000 bias-corrected bootstraps. For this experimental design, models were first run without covariates, except for baseline values of the mediator and the dependent variables. Baseline values were controlled due to the nature of this design and its focus on media effects.

Note that because all hypotheses are directional, 90% and 95% confidence intervals are included, with largely equivalent results. Where results are not equivalent, researchers may prefer to call these results trending. For an emphasis on the importance of replicating these findings, see the Discussion section.

Results

The current study hypothesized an indirect effect of being in the minority on a social media platform on attitude toward rival partisans via the perceived favorability of the national opinion climate.

H1 concerned the "a" pathway in this model, from the experience of being in the minority versus the majority (dummy-coded) on a social media platform to the post-browsing perceived opinion climate. As reported in full in Table 1a, H1 was supported, and being in the minority lead to perceiving a less favorable opinion climate, $b = -3.51$, $CI_{90}[-5.87, -1.15]$, $CI_{95}[-6.33, -.69]$, $t(403) = -2.45$, $p = .015$. As an alternative test of H1, rather than predicting the absolute value of the perceived favorability of the opinion climate, the *change* in favorability was predicted. This operationalization also supported H1 (see Table 1b). However, including all covariates weakened findings (see Table 1c), such that H1 was only significant using a one-tailed test, $p = .027$.

Table 1a. Predicting Favorability of Perceived Opinion Climate (No Covariates).

Model Summary	R.85	R .72	$F(3, 403)$ 350.51	p value $p < .001$			
Model	Coeff.	*SE*	*t*	*p*	CI$_{90}$	CI$_{95}$	VIF
Intercept	5.30	1.23	4.30	<.001***	3.27, 7.34	2.88, 7.73	
Minority (dummy-coded)	−3.51	1.43	−2.45	.015*	−5.87, −1.15	−6.33, −.69	1.00
Attitude toward rivals (pre-browsing)	−.05	.03	−1.53	.128	−.10, .00	−.11, .01	1.09
Opinion climate (pre-browsing)	.86	.03	30.67	<.001***	.81, .91	.81, .92	1.09

Table 1b. Predicting Change in Favorability of Perceived Opinion Climate (No Covariates).

Model Summary	R.27	R^2.07	$F(3, 403)$ 10.53	p value $p < .001$	
Model	Coeff.	*SE*	*t*	*p*	VIF
Intercept	5.30	1.23	4.30	<.001***	
Minority (dummy-coded)	−3.51	1.43	−2.45	.015*	1.00
Attitude toward rivals (pre-browsing)	−.05	.03	−1.53	.128	1.09
Opinion climate (pre-browsing)	−.14	.03	−4.96	<.001***	1.09

Note. Sum of Differences in Perceptions of Opinion Climate Favorability is included to stabilize the regression coefficients per Judd, Kenny, and McClelland (2001).

Table 1c. Predicting Perceived Opinion Climate (With Covariates).

Model Summary	R .85	R² .73	F(18, 388) 59.37	p value p < .001
Model	Coeff.	SE	T	p
Intercept	−1.89	7.96	−.24	.813
Minority (dummy-coded)	−2.84	1.47	−1.93	.054
Attitude toward rivals (pre-browsing)	−.04	.03	−1.11	.27
Opinion climate (pre-browsing)	.83	.03	26.94	<.001***
Democrat (dummy-coded)	3.52	1.67	2.11	.034*
Partisan strength	.53	.71	.74	.462
Political interest	−.11	.41	−.27	.789
Age	.03	.07	.48	.634
Education	.17	.64	.27	.785
Woman (dummy-coded)	.75	1.57	.47	.636
Avatar default (dummy-coded)	−1.29	1.61	−.80	.424
Default username (dummy-coded)	.67	2.18	.31	.760
Wrote post (dummy-coded)	1.25	1.45	.86	.392
Selected climate change	−.42	2.01	−.21	.835
Selected gun control	.98	2.20	.33	.657
Selected healthcare	.26	2.06	.13	.898
Selected immigration	−2.52	2.18	−1.16	.248
Selected social security	1.68	1.89	.89	.374
Selected tax policy	.62	2.11	.29	.771
Selected trade policy	1.94	2.53	.74	.445

H2a and H2b examined the association between the perceived favorability of the opinion climate and warmth (vs. coldness) toward rival partisans at baseline and post-browsing. H2a was supported, $r = −.279$, $p < .001$. H2b was supported, $r = −.283$, $p < .001$.

H3 investigated the impact of the minority versus majority condition on warmth toward rival partisans via the perceived favorability of the opinion climate. For "b" pathway coefficients of this proposed relationship across operationalizations, see Tables 2a and 2c. In summary, the relationship was significant using a one-tailed test, but only marginal using a two-tailed test; $a*b = 1.27$, $CI_{90}[.01, 1.13]$, $CI_{95}[−.02, 1.30]$. Notably, the direct relationship between perceived favorability of the opinion climate and warmth toward rival partisan was significant; $b = −.10$, $CI_{90}[−.15, −.03]$, $CI_{95}[−.17, −.02]$, $t(402) = −2.59$, $p = .010$. While these results are aligned with H3, there is some uncertainty concerning the strength and consistency of this relationship.

Table 2a. Predicting Warmth (vs. Coldness) Toward Rival Partisans (No Covariates).

Model Summary	R.90	R^2.81	$F(4, 402)$ 441.51	p value $p < .001$			
Model	Coeff.	SE	t	p	CI_{90}	CI_{95}	VIF
Intercept	1.63	.93	1.75	.081	.09, 3.16	−.20, 3.46	
Perceived opinion climate (post browsing)	−.10	.04	−2.59	.010*	−.15, −.03	−.17, −.02	1.02
Minority (dummy-coded)	1.27	1.07	1.19	.234	−.49, 3.03	−.82, 3.36	3.61
Attitude toward rivals (pre-browsing)	.91	.02	39.84	<.001***	.87, .95	.87, .96	1.09
Opinion climate (pre-browsing)	.07	.04	1.91	.056	.01, .13	−.00, .15	3.62

Table 2b. Predicting Change in Warmth (vs. Coldness) Toward Rival Partisans from Change in Perceived Opinion Climate (No Covariates).

Model Summary	R.24	R^2.06	$F(4, 402)$ 5.88	p value $p < .001$	
Model	Coeff.	SE	t	p	VIF
Intercept	1.63	.93	1.75	.081	
Change in perceived opinion climate	−.08	.04	−2.34	.020*	1.02
Minority (dummy-coded)	1.27	1.07	1.19	.234	1.02
Attitude toward rivals (pre-browsing)	−.09	.02	−3.92	<.001***	1.09
Sum of differences	−.01	.01	−1.07	.288	1.09

Note. Sum of Differences in Perceptions of Opinion Climate Favorability is included to stabilize the regression coefficients per Judd and colleagues (2001).

Table 2c. Warmth (vs. Coldness) Toward Rival Partisans (With Covariates).

Model Summary	R .85	R^2 .73	F(18, 388) 59.37	p value p < .001
Model	Coeff.	SE	t	p
Intercept	6.34	5.84	1.19	.236
Perceived opinion climate (post-browsing)	−.11	.04	−2.92	.004
Minority (dummy-coded)	1.54	1.08	1.43	.155
Attitude toward rivals (pre-browsing)	.90	.02	26.85	< .001
Opinion climate (pre-browsing)	.08	.04	2.13	.034
Democrat (dummy-coded)	.22	1.23	.18	.859
Partisan strength	−.46	.52	−.88	.378
Political interest	−.36	.30	−1.21	.227
Age	−.06	.05	−1.10	.272
Education	−.26	.47	.55	.585
Woman (dummy-coded)	.57	1.15	.49	.623
Avatar default (dummy-coded)	−.76	1.18	−.64	.521
Default username (dummy-coded)	−2.46	1.60	−1.54	.124
Wrote post (dummy-coded)	1.79	1.07	1.68	.094
Selected climate change	1.16	1.47	.79	.430
Selected gun control	1.53	1.61	.95	.345
Selected healthcare	−.85	1.51	−.56	.571
Selected immigration	−.76	1.60	−.48	.644
Selected social security	2.28	1.39	1.64	.101
Selected tax policy	2.86	1.55	1.85	.065
Selected trade policy	1.76	1.86	.95	.345

Answering RQ1 by considering moderation by partisanship (dummy-coded), no moderation was found per the minority vs. majority manipulation, $p = .239$, or per the impact of the perceived favorability of the opinion climate on warmth toward rival partisans, $p = .796$. All findings are thus robust to participant partisanship and the associated stimulus sampling.

Discussion

In an era of intensifying political polarization, characterized by heightened animosity toward rival partisans, researchers are actively working toward remedies. Many scholars have implicated patterns of mass and social media consumption in polarization processes. The current analysis adds to a relatively small body of work (see Kubin & von Sikorski, 2021, for a review) investigating *depolarizing* impacts of media exposure. Further, it does so while focusing on the social media context, which contains a diverse variety of content, both in terms of argumentation and style. In doing so, the current study sought to validate past findings and to help pinpoint an underlying psychological process, theorized by drawing on spiral of silence theory and Brewer's (1999) extension of social identity theory, that could impact citizens whether they are reading work by political journalists or browsing the r/politics subreddit.

The analysis in the current study builds upon spiral of silence theory, developing the theoretical argument that, anticipating having to interact across party lines, people who perceive a *less* favorable climate of opinion will be motivated to report *warmer* attitudes toward out-group partisans. It thus contributes to a small group of studies (e.g., Lee et al., 2021; Neubaum & Krämer, 2017; Sude et al., 2019; Tsfati & Chotiner, 2016; Westerwick et al., 2020) demonstrating that people who are uncertain of their majority status, or who actively perceive themselves to be in the minority, will report less extreme views. Further, following spiral of silence theory, the current analysis emphasizes the social motivations behind this apparent accommodation. It is argued that people *want* to anticipate positive social interactions, even in an intergroup context, if the size of the out-group is *sufficiently* large to entail frequent social encounters. This motivated reasoning was postulated based on both spiral of silence theory and Brewer's (1999) discussion of factors that impact out-group animus. In summary, it is argued that people dislike feeling trapped in intractable social conflicts and will thus compensate with motivated reasoning.

The current study chose to test this prediction in a media effects context by assigning participants in the minority or majority group (with regard to partisanship) on an online forum imitating Reddit (and drawing stimuli from that platform). In line with past work, this experience was argued to prompt a shift in perceptions of the national opinion climate (Hypothesis 1), with perceiving a *less* favorable opinion climate argued to promote *warmth* toward partisan rivals (Hypothesis 3), in line with the motivated reasoning process postulated above. Additionally, Hypothesis 2 predicted that this relationship between perceptions of the opinion climate and out-group feeling would be in the expected direction both pre- and post-viewing the social media site, and thus independent of specific media effects contexts.

Ultimately, the study yielded support for these hypotheses. However, the pathway from the manipulation to perceived opinion climate to feeling about out-group partisans was only significant using a one-tailed test. Furthermore, the main effect of the manipulation on opinion climate perceptions was relatively weak, significant by both one and two-tailed tests when covariates were excluded from the model, but only significant according to the one-tailed test when covariates were included.

This suggests that the variation introduced by a more ecologically valid browsing experience may have limited the effectiveness of the manipulation. Nonetheless, the patterns of correlation pre- and post-browsing, as well as the weak impact of the manipulation itself all suggest that affective polarization and

perceived opinion climate are related in the predicted direction. Specifically, the smaller participants feel that their in-group is relative to the out-group, the more warmth they report toward their partisan rivals. This is aligned with the proposed motivated reasoning process, but more thorough investigation of mechanism and replication with more alternative manipulations are needed.

Conclusion

The current work makes a key contribution by establishing that the previously observed relationships (Tsfati & Chotiner, 2016) between exposure to political content, perceived opinion climate, and affective polarization are maintained across various stimuli, which were selected from Reddit using a latent-spaced modeling stimulus sampling approach. This methodological innovation helps to establish the ecological validity of the patterns identified per H1, H2, and H3. In doing so, it provides evidence that the process by which mass media impacts perceptions of public opinion and thus affective polarization (Tsfati & Chotiner, 2016) can occur for social media as well.

This work makes another key contribution by focusing on attitudes toward rival partisans, rather than specific political policies. Positive affect toward rival partisans has various implications beyond the endorsement of specific political attitudes. Democracies can survive ideological diversity, but only when both sides are willing to compromise for a public good, at least occasionally (Strömbäck, 2005). As hostility toward rival partisans grows, willingness to compromise declines (e.g., Gervais, 2019). The current analysis argues that when people have reason to anticipate interaction with their partisan rivals, they will be motivated to want these interactions to go well.

The focus of the current analysis on social interaction stands in contrast to previous work seeking to leverage national social identity to overcome partisan divides (Knobloch-Westerwick et al., 2020; Levendusky, 2018; Wojcieszak & Garrett, 2018; Wojcieszak et al., 2020). Here, partisans are not argued to re-define themselves in terms of an inclusive, superordinate, national identity. Rather, in line with spiral of silence theorizing, they are argued to acknowledge and respond to the practical social reality of anticipating interaction across party lines.

Future research should integrate these findings with work studying the impact of different types of content—particularly uncivil political content—on impressions of rival partisans (e.g., Kluck & Krämer, 2021; Popan, Coursey, Acosta, & Kenworthy, 2019). The current analysis employed randomly harvested stimuli and thus identified patterns that are likely independent of specific features of the stimuli. However, it could be combined with manipulation of the stimuli themselves. For example, if people find themselves on an online forum where out-group members behave uncivilly, they might perceive rival partisans to be incapable of providing a positive social experience. In that case, intergroup hostility could increase (Brewer, 1999). In contrast, if people find themselves on a forum filled with reasonable, civil, cross-cutting content, affective polarization, and perhaps ideological polarization, could decline. Further, from the perspective of spiral of silence theory, in this situation, rather than falling silent and failing to express their views, individuals might anticipate positive interactions and feel safe speaking up.

The current work does have several limitations. First, as discussed, allowing participants to freely browse different topics, while more ecologically valid, may have weakened the impact of the manipulation. Second, tests per H2 and H3 are correlational, and more research is needed to fully establish causality. Similarly, research should investigate the proposed impacts of the opinion climate on social expectations directly. While social motivations can be inferred from feelings of warmth toward rival partisans, future research should examine specific social goals. People who are sure of their majority status might report fewer listening-oriented social goals compared with those who are unsure of their status.

Further, the current study did not employ a manipulation check. It is possible that the manipulation influenced perceptions of public opinion via numerous mechanisms, including the relative salience of Republicans versus Democrats. This reasoning is in line with findings from past work (e.g., Sude et al., 2019). Thus, it may not be finding oneself in the minority vs. the majority per se that influences perceptions, but rather the impact of this experience on the salience of partisan groups.

Furthermore, the stimuli are sampled from a single social media platform, Reddit. Hence, results may not be generalizable beyond this content. Also, because complex real-world stimuli are employed, internal validity suffers. As mentioned above, future research will need to establish whether content features such as argument quality or incivility moderate the identified pattern. While the rich reality of a user's everyday experience of a site like Reddit cannot easily be divided up into separately manipulable components, it is certainly possible to vary what types of content are encountered. Indeed, content-focused algorithmic moderation is becoming more common as news organizations strive to handle thousands of comments per day (BBC News, 2020; Etim, 2017; Huang, 2016). Appropriately executed, these attempts may help build bridges between citizens with competing political views, at least when citizens expect to have to engage in cross-cutting social encounters.

Another limitation is that this study does not examine audience characteristics regarding those who find themselves in the minority (versus the majority) on online forums. People may seek out cross-cutting social media content for different reasons that could impact their susceptibility to social influence. For example, preexisting open-mindedness could strengthen spiral of silence-related processes while other motivations, such as reading to counterargue (Taber & Lodge, 2006) or otherwise engaging in "dark participation" (Quandt, 2018), could weaken them. These motivations could also be impacted by the platform itself, see Yarchi, Baden, and Kligler-Vilenchik (2021) for a discussion.

It should also be noted that the study employs a quota sample drawn from a Qualtrics panel. While this helped to ensure an appropriately diverse sample, men were overrepresented. Further, this is a panel sample only, not a probability sample, and thus cannot claim to be representative of the U.S. population.

Using an adult sample of American partisans and stimuli harvested from Reddit using latent space modeling, this study showed that even in an era of intensifying polarization, people may still be motivated to extend an olive branch. Participants reported greater warmth toward their rivals if their browsing experience led them to perceive a less favorable national opinion climate. In seeking to depolarize the electorate, both in the United States and in other democracies, researchers may be able to leverage

anticipated frequency and quality of social interaction as a key factor motivating congeniality across party lines.

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