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Linking Exposure to Political Content on Social Media with Political Polarization:

The Mediating Role of Anger

Audrey Anne Halversen

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of

Master of Arts

Jason Freeman, Chair
Kevin John
Clark Callahan

School of Communications

Brigham Young University

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ABSTRACT

Linking Exposure to Political Content on Social Media with Political Polarization: The Mediating Role of Anger

Audrey Anne Halversen
School of Communications, BYU
Master of Arts

Previous research has detailed concerns that exposure to both pro- and counter- attitudinal content on social media can result in outcomes of ideological polarization (e.g. Bail et al., 2018; Lu & Lee, 2018). However, further research is needed in order to understand the conditions under which this polarization may take place. To investigate this issue, this study utilizes a sample of 414 social media users in the U.S. to investigate the mediating effects of a) anger toward political opposites and b) anger toward oppositional social media content on the relationships between various types of political content exposure and the outcome of ideological polarization. Results revealed that both types of politically oriented anger partially or fully mediated all relationships between the explanatory variables and the outcome variable, demonstrating that exposure to all types of political content on social media can affect polarization through the mechanism of anger. Theoretical implications for the echo chamber theory and the backfire effect are discussed.

Keywords: social media, political content, polarization, anger, backfire effect, echo chamber theory

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Introduction

Political polarization is on the rise in America (MCarty et al., 2016). Democrats and Republicans are becoming increasingly divided in their ideological views (Pew Research Center, 2014), and large shares of Americans view members of their rival party as "immoral" and "close-minded" (Pew Research Center, 2019). In the midst of this polarized political climate, many have expressed concern over the ways in which media consumption—especially digital media consumption—may encourage polarization. Some have argued that online echo chambers or filter bubbles create feedback loops of pro-attitudinal content that reinforce pre-existing views (Pariser, 2011). Others have argued that, even when media consumers are exposed to counter-attitudinal content, this content can trigger a backfire effect which similarly causes individuals to become more convinced of their original positions (Bail et al., 2018; Nyhan & Reifler, 2010).

Claims of both the echo chamber theory and the backfire effect have met with significant challenges over the past few years (Bruns et al., 2014; Dubois & Blank, 2018; Wood & Porter, 2019), suggesting there is still much to learn about the conditions under which exposure to both pro- and counter-attitudinal political content may encourage political polarization. This is especially true in the context of social media, where users are typically exposed to a variety of ideological views (Beam et al., 2018; Nelson & Webster, 2017).

One factor that may play an important role in the relationship between exposure to political content and political polarization is anger. Previous research has found that exposure to political content can elicit anger (Hasell & Weeks, 2016; Lee & Kwak, 2014). Further, anger has been linked to various forms of political polarization (Webster, 2018; Weeks, 2015). Social media appears to be especially conducive to expressions of anger, especially where politics are involved (Fan et al., 2014; Fan et al., 2016; Roberts et al., 2012), suggesting that the role of

anger in facilitating polarization outcomes may be especially pronounced on these platforms. Therefore, this study will investigate anger as a mediator of the relationship between exposure to political content and polarization. Specifically, this study will investigate the mediating effects of a) anger toward political opposites and b) anger toward oppositional social media content on the relationship between various forms of exposure to political content on social media and the outcome of ideological polarization.

Literature Review

Exposure to Pro-Attitudinal Political Media

Concerns about media consumers' exposure to mainly pro-attitudinal political content have origins in mid-20th century academic conversations. Festinger (1957), for example, argued under cognitive dissonance theory that once people have determined their beliefs and attitudes, they are motivated to maintain those beliefs. Extending this idea to the realm of media engagement, Klapper (1960) later argued that audiences tend to expose themselves primarily to mass media that confirm their beliefs and values. In the decades that followed, a variety of scholars investigated topics related to audience inclinations toward selective exposure, including moderators of selective exposure (Su, 1971; Schwartz et al., 1980), information utility (Brock et al., 1970; Canon, 1964), and individual factors that influence selective exposure (Frey et al., 1986; Innes, 1978; Schultz, 1974). By the 1980s, two notable scholars had published reviews confirming the existence of selective exposure effects (Cotton, 1985; Frey, 1986), and the topic has since received continued academic interest (Smith et al., 2008).

Most recently, scholars have sought to understand the ways in which digital media create opportunities for selective exposure. The rise of digital media has constructed a high-choice media environment wherein consumers are afforded an increased ability to customize their content exposure (Stroud, 2008). As a result, scholars have debated the hypothesis that individuals leverage this affordance in order to selectively expose themselves to content that confirms their pre-existing views (Stroud, 2008).

A number of studies have contended that audiences do, in fact, demonstrate a preference for online content that supports their views. (Fischer et al., 2005; Stroud, 2011). For example, Knobloch-Westerwick & Meng (2009) found that, when presented equally with pro- and

counter-attitudinal content on an online opinion forum, participants spent 36% more time reading pro-attitudinal content. Additionally, this and other studies have further found that users' preference for pro-attitudinal content is further pronounced when prior attitudes and preferences are strongly held (Brannon et al., 2007; Knobloch-Westerwick & Meng; 2009). In other words, those who feel most certain about their beliefs are most likely to prefer attitudinally consistent content.

Psychologists have explained this dynamic as "confirmation bias"—or, the "seeking or interpreting of evidence in ways that are partial to existing beliefs, expectations, or a hypothesis in hand" (Nickerson, 1998 in Spohr, 2007, p. 154). Supporting this theory in the digital age, there is evidence to suggest that individuals' political beliefs coincide with the online media they choose to consume (Stroud, 2008) and that consumers of online news are more willing to rate attitude-consistent outlets as credible sources, while remaining skeptical of attitude-challenging sources (Messing & Westwood, 2012).

Also important to the modern understanding of the high-choice media environment and its potential to encourage pro-attitudinal content consumption is an appraisal of the increasingly complex variables that factor into audiences' information environments. For instance, Dylko et al. (2017) noted that technologies create customizability in two distinct ways. First, user-driven customizability is afforded when technologies allow users to directly modify their information exposure. In the context of social media, this could include a user choosing which pages or profiles to follow. Second, system-driven customizability is afforded when technologies modify the information environment without direct user involvement. On social media platforms, this is what takes place when algorithms determine what content appears on a user's feed. Whether user-driven or systems-driven customizability is more conducive to pro-attitudinal selective

exposure remains a topic of debate. Bakshy et al. (2015) found that individual choices limited exposure to cross-cutting content more than algorithmic rankings. Conversely, Dylko et al. (2017) found that system-driven customizability was more conducive to pro-attitudinal selective exposure than user-driven customizability.

Both user-driven and system-driven customizability play into ongoing concerns about echo chambers (Jamieson & Cappella, 2008) or filter bubbles (Pariser, 2011) in online information environments. Dubois and Blank (2018, p. 729) defined an echo chambers as "a metaphorical way to describe a situation where only certain ideas, information and beliefs are shared," while filter bubbles have been defined as a state of isolation from counter-attitudinal views that is encouraged by the personalization affordances of online platforms (Pariser, 2011).

There is some evidence that supports the existence of online echo chambers and filter bubbles. For instance, Holbert and Benoit (2009) found that consumption of content from a media outlet with a political bias is correlated with content consumption from outlets with that same political bias. This suggests that people who engage with one politically slanted outlet may be likely to surround themselves with similarly affirming content, creating an attitudinally confirming "bubble" of information. This idea was also supported by Himelboiem et al. (2013), who used cluster analysis to identify subgroups of users responding to the U.S. President's 2012 State of the Union Speech on Twitter. Their analysis showed a pattern of ideologically fragmented interactions where hubs were largely composed of either conservative or liberal opinion, suggesting that discussions on social media platforms can be somewhat ideologically homogeneous.

Pro-Attitudinal Political Media and Polarization

Although a range of other scholarship argues against the echo chamber theory (Bruns et al., 2014; Dubois & Blank, 2018), the possible existence of online echo chambers has prompted concern—both in the scholarly community and more widely throughout society—that exposure to pro-attitudinal content is facilitating the rise of political polarization, including affective polarization (i.e. the increasing tendency for citizens to negatively perceive the opposite party) and ideological polarization (i.e. the divergence of citizen views to opposite ends of the liberal-conservative spectrum).

Some evidence exists to suggest there may be some merit to these concerns. Exposure to pro-attitudinal political messaging does appear to reinforce attitudes (Knobloch-Westerwick et al., 2015; Westerwick, 2017), and a number of studies have identified a connection between pro-attitudinal media consumption and various forms of polarization. For example, using data from both the United States and South Korea, Kim (2015) found an association between selective exposure to political content and polarized attitudes toward political candidates. Similarly, Lu & Lee (2018) identified a correlation between exposure to pro-party television and polarized views of political candidates and parties. Using cross-sectional data, Stroud (2010) provided compelling evidence that selective exposure to partisan media results in polarization over time. Meanwhile, Tewksbury & Riles (2015) discovered that higher frequencies of exposure to online news were associated with increased ideological differences between Republicans and Democrats.

The body of scholarship described above promotes the idea that polarization may be facilitated by selective exposure to partisan content online. However, scholars have also argued that concerns of over-exposure to partisan content leading to polarization are overstated. Trilling

et al. (2017), for instance, failed to find evidence that exposure to pro-attitudinal content increases polarization. Meanwhile, Prior (2013) stated that—in part, due to measurement problems—there has historically been a dearth of solid evidence linking partisan content consumption to polarization. Therefore, further research is needed in order to understand the conditions under which this relationship may occur.

Counter-Attitudinal Political Media in Online Environments

Further complicating the idea of online echo chambers is rising evidence suggesting that exposure to pro-attitudinal content—rather than being encouraged by digital media—is moderated in online environments (Masip et al., 2020) and in media environments generally. For example, using a series of data collected from multiple surveys, Garrett et al. (2013) found that, between 2004 and 2008, Americans who consumed content from pro-attitudinal political sources were also more likely to consume content from counter-attitudinal sources. Further, their results showed that this was true even for those who were most committed to their ideological beliefs, though the relationship was not as strong for these consumers.

Similar findings have emerged in studies purely focused on online content consumption. Knobloch-Westerwick & Kleinman (2012) found that those who frequently consume online news are less likely to show a confirmation bias in their consumption habits. More recently, Masip et al. (2020) confirmed a similar dynamic for social media users, finding that more active social media users were more likely to be exposed to counter-attitudinal content than less frequent users. In observations of online behavior, Nelson and Webster (2017) found that Facebook users navigated to a variety of news sites from their Facebook feeds, and that "red" and "blue" sites had ideologically diverse audiences. Similarly, Beam et al. (2018) found that use of Facebook news encouraged both pro- and counter-attitudinal news exposure. These findings

suggest that digital media, rather than creating echo chambers, may provide opportunities for incidental—rather than selective—exposure to counter-attitudinal content that facilitates user engagement with cross-cutting views. Of course, it is also possible that active social media users leverage the customizability aspects of these platforms (Dylko et al., 2017) to intentionally expose themselves to counter-attitudinal content, though this possibility has not been as thoroughly explored as selective exposure to pro-attitudinal content.

Counter-Attitudinal Political Media and the Backfire Effect

While numerous studies have investigated the potential for pro-attitudinal content exposure to encourage various forms of polarization, fewer studies have investigated the potential for counter-attitudinal content exposure to do the same. However, this idea has been promoted, to some degree, through the theory known as the "backfire effect" (Nyhan & Reifler, 2010). The backfire effect has been used to describe an individual's entrenchment into misinformation when exposed to content meant to correct that misinformation. In some cases, this effect may occur because the individual has a personal stake in the matter or holds a belief that conflicts with the corrective information (Lewandowsky et al., 2012; Nyhan & Reifler, 2010). In other cases, in what are termed "familiarity backfire effects," the simple repetition of the misinformation, though followed by correction, may result in a strengthening of the misinformation (Ecker et al., 2020; Peter & Koch, 2015).

The backfire effect may be more broadly defined as an individual's increased commitment to a previously held belief or ideology when exposed to counter-attitudinal content (Chen et al., 2019; Sethi & Rangaraju, 2018; Yang et al., 2020). This understanding of the backfire effect is, in some ways, united with ideas of pro-attitudinal selective exposure and confirmation bias, in that both can be understood under the umbrella of cognitive dissonance

theory. In the case of pro-attitudinal selective exposure, individuals have a desire to avoid cognitive dissonance, while in the case of the backfire effect, individuals try to decrease dissonance by strengthening their commitment to a pre-existing belief or moving even further from the position of the new information. This view is summed up by Dieter Frey, who said, "when facing cognitive dissonance brought by attitude-challenging information, the consistency of the cognitive system is maintained by either avoiding attitude-inconsistent information, or by counter arguing attitude-inconsistent information in order to find flaws in it" (Frey, 1986 in Spohr, 2017, p. 154).

The backfire effect also aligns to some degree with theories of "motivated reasoning" or "biased assimilation," which argue that "people engage in cognitive processes in order to advance some goal other than the formation of accurate beliefs" (Suhay & Erisen, 2018, p. 794). This idea has been substantiated by the extant literature, which shows that individuals tend to perceive counter-attitudinal information as lower quality and are more likely to generate counterarguments when faced with this information (e.g. Lodge & Taber, 2013; Munro et al., 2002; Redlawsk et al., 2010). However, the backfire effect goes beyond these theories by purporting that audiences not only resist attitudinally challenging information but retreat further toward their existing beliefs when confronted with this information.

Previous research has provided compelling evidence that this backfire effect occurs. Nyhan and Reifler (2010), the inventors of the theory, found that when conservatives were presented with information about weapons of mass destruction in Iraq that conflicted with their attitudes, they subsequently became more convinced of their original views. This finding has been replicated for a variety of other political issues, including healthcare reform (Nyhan et al., 2013), the 9/11 terrorist attacks (Prasad et al., 2009) and climate change (Hart & Nisbet, 2012).

Evidence for the backfire effect has also been found in social media environments. For example, Bail et al. (2018) paid Democrats and Republicans to follow bots that retweeted messages by elected officials and opinion leaders with opposing political views. Their results revealed that Republicans expressed far more conservative attitudes after following a liberal Twitter bot, while Democrats expressed slightly more liberal attitudes after following a conservative Twitter bot. In other words, a backfire effect occurred when these users were exposed to counter-attitudinal content in their online social network. Further supporting the potential for a backfire effect to occur online, Lee et al. (2014) found that individuals who participate in online political discussions more often and have more ideologically diverse social media feeds are more likely to hold polarized opinions about party and ideology.

In spite of the above evidence, it should also be noted that some scholars have failed to find evidence of the backfire effect. Wood and Porter (2019), for example, found no informational corrections to pre-existing beliefs that were capable of triggering a backfire effect among a subject pool of over 10,000 and across five different studies. These findings suggest that people are generally amenable to fact-checking information, even when it conflicts with their existing attitudes. However, because the study used verified information to correct factually *misinformed* beliefs, the results of this study may not extend to instances of exposure to counter-attitudinal content that is more opinion-based.

While evidence exists to suggest that exposure to both pro- and counter-attitudinal content can result in outcomes of polarization (Bail et al., 2018; Kim, 2015; Lu & Lee, 2018; Stroud, 2010; Tewsbury & Riles, 2015), there is also evidence against these claims (Prior, 2013; Trilling et al., 2017; Wood & Porter, 2019) compelling enough to warrant caution in predicting these relationships. Therefore, we posit the following four research questions. Because of the

variety of ways in which content exposure is shaped on social media, we differentiate between selective exposure (i.e. exposure that occurs when users intentionally seek out content) and incidental exposure (i.e. content that the users happen to come across without intentionally seeking it out) to both pro- and counter-attitudinal content.

RQ1: Will incidental exposure to pro-attitudinal political content on social media be positively associated with ideological polarization?

RQ2: Will selective exposure to pro-attitudinal political content on social media be positively associated with ideological polarization?

RQ3: Will incidental exposure to counter-attitudinal political content be positively associated with ideological polarization?

RQ4: Will selective exposure to counter-attitudinal political content be positively associated with ideological polarization?

Because current research regarding both a) the potential for exposure to pro-attitudinal political content to reinforce views and create polarization (the echo chamber effect) and b) the prevalence of backfire effects in response to counter-attitudinal political content exposure is varied, there is a need to understand the conditions under which both of these theories are viable. More specifically, there is a need to understand the conditions under which exposure to both pro- and counter-attitudinal social media content results in polarization.

One variable which has been explored in the context of political media consumption and polarization is anger. Previous work has indicated that exposure to political content can elicit anger (Hasell & Weeks, 2016; Lee & Kwak, 2014). Further, other scholars have connected anger to outcomes of polarization (Webster, 2018; Weeks, 2015). Therefore, this study will investigate

politically oriented anger as a mediator between various forms of content exposure and political polarization.

Political Media Exposure and Anger

Previous scholars have argued that anger is central to everyday political activity and news consumption (Ost, 2004; Wagner & Boczkowski, 2019). In fact, the mere act of prompting individuals to think about politics has been shown to be a sufficient means of provoking a reaction of anger (Webster, 2018). While anger is typically experienced as a short-lived mental state (Nabi, 1999), anger has also been identified as a powerful motivator of political participation and information seeking (Valentino et al., 2011; Weber, 2013), suggesting that the cumulative effects of politically oriented anger can impact behavior change. For example, anger has been linked to individuals' willingness to engage in political action (Leach et al., 2006) and participate in protest movements (Jasper, 2014). Therefore, it is important to understand how political anger affects individuals' attitudes and behaviors.

There is significant evidence to suggest that politically oriented anger may arise as a result of political content exposure. Lee and Kwak (2014) found that exposure to political satire about a public issue elicited negative emotions—specifically, anger and worry—in viewers. Similarly, Hasell and Weeks (2016) found that those who consumed partisan news prior to the 2012 United States presidential election experienced anger toward opposing candidates. Adding to this work, Chen et al. (2017) found not only that anger was related to satirical political content exposure, but that participants were more likely to experience anger when exposed to counter-attitudinal satire. Gervais (2017) uncovered a similar dynamic, finding that exposure to uncivil political statements that targeted one's in-group elicited anger in participants, while exposure to pro-attitudinal uncivil statements did not.

With this body of research in mind, it seems likely that exposure to counter-attitudinal political content is associated with anger toward political opposites. However, despite some evidence to the contrary (Gervais, 2017), it may also be possible that exposure to pro-attitudinal political content—especially on social media—is associated with anger toward political opposites. Because anger appears to be relatively widespread and contagious on social networks (Fan et al., 2014; Fan et al., 2016; Roberts et al., 2012), and because angry sentiment appears to be especially salient in political content on social platforms (Roberts et al., 2012), there is reason to believe that exposure to political content on social media may be especially likely to trigger anger and other negative emotions, whether pro- or counter-attitudinal in nature. This hypothesis has already been partially supported by Wagner and Boczkowski (2019), who interviewed individuals about their news consumption experiences and found that participants experienced more intense negative emotions—including anger and anxiety—when consuming news through social media, rather than through traditional outlets. Further, many pro-attitudinal political posts on social media may reference users' political opposites by calling out the actions of politicians or others with whom the poster and user disagree, thus bringing "the other" to the user's mind and prompting a response of anger.

Anger and Political Polarization

Where there is reason to believe that exposure to political content fuels anger, there is also reason to believe that anger fuels partisanship and polarization (Webster, 2018; Weeks, 2015). Anger has been shown to cause partisans to become more polarized in their views on certain issues, including affirmative action (Banks & Valentino, 2012) and health care (Banks, 2014). After recalling a number of studies (e.g. MacKuen et al., 2010; Valentino et al., 2008) which suggest that anger causes citizens to rely more heavily on preexisting partisan viewpoints,

Gervais (2017, p. 387) notes that "accordingly, anger should motivate more partisan behavior, including expressions of disdain toward the out-group."

Some extant research appears to confirm Gervais' conclusion. Previous studies have connected anger toward political opponents with endorsement of aggressive policies toward those opposing groups (Halperin & Gross, 2010; Lemer et al., 2003; Skitka et al., 2006). It has also been argued that anger can increase social polarization between Democrats and Republicans (Webster et al., 2020).

One of the most direct associations between anger and polarized outcomes was found by Huber et al. (2015), who discovered that anger increased partisan attitudes and caused individuals on both sides of the political aisle to perceive higher levels of polarization between the two parties. They concluded that anger may fuel partisanship, which may in turn fuel anger, creating a cycle of polarization that damages democratic functioning and cooperation. This dynamic, as well as the resulting negative impacts on democracy, have been similarly warned against by other scholars (Webster et al., 2020).

Anger and Biased Assimilation

One of the ways in which anger may influence the relationship between exposure to political content and partisanship is through its impact on biased assimilation (Suhay & Erisen, 2018). Biased assimilation may be defined as "the tendency of individuals to adopt other opinions if they are similar to their own" (Chen et al., 2019, p. 1). Suhay and Erisen (2018) argue that anger motivates people to engage in biased assimilation of political information. Their research showed that participants exposed to counter-attitudinal arguments experienced a number of negative emotions, and, importantly, that those who experienced anger in reaction to these arguments were also more likely to demonstrate a biased reaction to the content.

Similar to this finding, Weeks et al. (2015) found that participants experiencing anger were more likely to believe misinformation that aligned with their views and reject information that conflicted with their views. Meanwhile, Knobloch-Westerwick et al. (2020) found that participants experiencing a more negative affective state were more likely to demonstrate confirmation bias. In the study most similar to ours, Lu and Lee (2018) identified anger and fear as mediators of the relationship between exposure to pro-party television sources and affective polarization among partisans. However, scholars have yet to investigate whether anger mediates effects of political content exposure on ideological polarization, and this model has not been researched in the context of social media.

In light of the above studies, including those that highlight the relationship between exposure to political content and anger (Hasell & Weeks, 2016; Lee & Kwak, 2014) and those that note a relationship between anger and various forms of political polarization (Webster, 2018; Weeks, 2015), it is possible that politically-oriented anger is an important factor in the relationship between political content exposure and polarization. In order to explore this possibility, we will investigate both anger toward political opposites (including opposing party, oppositional party leaders, and citizens of an oppositional party) and anger toward oppositional social media content (including reactions of anger toward oppositional social media posts, content posted by opposing politicians, and online conversation with political opposites). Therefore, we propose the following hypotheses:

H1: Anger toward political opposites will mediate the relationship between incidental exposure to pro-attitudinal political content on social media and ideological polarization.

H2: Anger toward oppositional social media content will mediate the relationship between incidental exposure to pro-attitudinal political content on social media and ideological polarization.

H3: Anger toward political opposites will mediate the relationship between selective exposure to pro-attitudinal political content on social media and ideological polarization.

H4: Anger toward oppositional social media content will mediate the relationship between selective exposure to pro-attitudinal political content on social media and ideological polarization.

H5: Anger toward political opposites will mediate the relationship between incidental exposure to counter-attitudinal political content on social media and ideological polarization.

H6: Anger toward oppositional social media content will mediate the relationship between incidental exposure to counter-attitudinal political content on social media and ideological polarization.

H7: Anger toward political opposites will mediate the relationship between selective exposure to counter-attitudinal political content on social media and ideological polarization.

H8: Anger toward oppositional social media content will mediate the relationship between selective exposure to counter-attitudinal political content on social media and ideological polarization.

Method

In order to investigate the research questions and hypotheses, a survey was conducted online. The sample for this survey was collected through Amazon Mechanical Turk. Participants were eligible to participate in this study as long as they were over the age of 18 and had an active social media profile on at least one platform. All participants were required to read and agree to a consent form detailing the procedures, risks, and terms of the study. Prior to conducting this study, all designs and procedures were approved by the Institutional Review Board.

In order to compensate for documented validity issues with this platform (Peer et al., 2014), two attention checks were included in the survey, and participants who failed to accurately respond to both attention check questions were removed from the sample. This strategy has been shown to improve the quality of data collected through Amazon Mechanical Turk (Aust et al., 2013; Buhrmester et al., 2011). Initially, 428 individuals participated in the survey. To ensure data quality, nine participants were removed from the sample for failing to pass one or both of the two attention checks and five participants were removed from the sample for completing the survey in an unusually short period of time (less than 2 minutes). A sample size of 414 participants remained. Each participant was paid $1.00 for their participation in this study.

Participants

Participants were asked to respond to a range of demographic questions, including age, gender, race, ethnicity, and education level. Participants were also asked to report the political party (if any) with which they identify and to describe their level of activity on social media (including frequency of use and average hours per day spent on social media).

Participants were between the ages of 18 and 64 (M = 38.9, SD = 10.6), and self-identified as female (44.9%), male (53.1%), and non-binary (0.7%). A few respondents (1.2%) indicated that they preferred not to disclose their gender. Participants were asked to indicate their race and were allowed to select multiple boxes. A variety of races were represented in the sample, including White (78.7%), Black or African American (10.6%), Asian (8.7%), American Indian or Alaska Native (1.4%), Native Hawaiian or Pacific Islander (0.2%) and other (1.9%). Participants were also asked to indicate if they were of Hispanic, Spanish, or Latino ethnicity. A number of participants indicated that they belonged to at least one of these ethnic groups (7.5%), while the remainder indicated that they did not (92.3%).

The education levels of participants were as follows: less than high school degree (0.7%), high school graduate (9.9%), some college but no degree (15.2%), associate degree in college (10.1%), bachelor's degree in college (44.9%), master's degree (14.3%), doctoral degree (1.7%), and professional degree (JD, MD) (2.9%). Participants identified their party affiliation as Republican (23.7%), Democrat (50.0%), Independent (23.4%), and other (1.7%). A few participants (1.2%) indicated no party preference. On the composite scale assessing social and fiscal ideology, 138 participants scored on the conservative side of the scale (33.3%), 210 participants scored on the liberal side of the scale (50.6%), and 66 participants indicated ideological neutrality (15.9%). See Table 1 for full sample characteristics.

Measures

Explanatory Variables

The following explanatory variables were used to assess various types of exposure to political content on social media. These measures were adopted from Weeks et al.'s (2017) measures of pro-attitudinal selective exposure and counter-attitudinal incidental exposure and

were expanded to include pro-attitudinal incidental exposure and counter-attitudinal selective exposure.

Pro-attitudinal incidental exposure. The degree to which participants were incidentally exposed to pro-attitudinal political content on social media was measured using the following items: "Sometimes people see political opinions or news on their social media feeds that they did not seek out. In the past month, how often have you encountered the following types of content on your social media feeds without having to actively search them out? 1) content that was positive toward a politician you support 2) content that was critical of a politician you oppose 3) content that supported your political views." Participants responded to items on a six-point scale (1 = "none" 2 = "about once" 3 = "2-3 times" 4 = "once a week" 5 = "a few times a week" 6 = "every day"), and items were averaged. Cronbach's alpha for this scale was 0.87, $M = 4.16$, $SD = 1.37$.

Pro-attitudinal selective exposure. The following items were used to measure the degree to which participants sought out pro-attitudinal political content on social media: "Sometimes people intentionally search for certain political opinions or news on social media. In the past month, how often have you intentionally searched for content on social media that… 1) was positive toward a politician you support 2) was critical of a politician you oppose 3) supported your political views." Participants responded to these items on a six-point scale (1 = "none" 2 = "about once" 3 = "2-3 times" 4 = "once a week" 5 = "a few times a week" 6 = "every day"), and items were averaged. Cronbach's alpha for this scale was .093, $M = 3.09$, $SD = 1.72$.

Counter-attitudinal incidental exposure. The degree to which participants were incidentally exposed to counter-attitudinal political content on social media was measured using

the following items: “Sometimes people accidentally come across political opinions or news on social media that they did not seek out or expect to see. In the past month, how often have you accidentally encountered content on social media that… 1) was critical of a politician you support 2) was favorable toward a politician you oppose 3) disagreed with your political views ” Participants responded to items on a six-point scale (1 = “none” 2 = “about once” 3 = “2-3 times” 4 = “once a week” 5 = “a few times a week” 6 = “every day”), and items were averaged. Cronbach’s alpha for this scale was 0.90, $M = 4.02$, $SD = 1.44$.

Counter-attitudinal selective exposure. The following items were used to measure the degree to which participants sought out counter-attitudinal political content on social media: “Sometimes people intentionally search for certain political opinions or news on social media. In the past month, how often have you intentionally searched for content on social media that… 1) was critical of a candidate you support 2) was favorable toward a candidate you oppose 3) disagreed with your political views. ” Participants responded to items on a six-point scale (1 = “none” 2 = “about once” 3 = “2-3 times” 4 = “once a week” 5 = “a few times a week” 6 = “every day”), and items were averaged. Cronbach’s alpha for this scale was .092, $M = 2.38$, $SD = 1.48$.

Mediating Variables

Following Webster’s (2018) finding that merely asking participants to think about politics can elicit anger, participants were prompted to investigate their emotional state while thinking about a variety of political groups, individuals, interactions, and content. These items were divided into two primary mediating variables.

Anger toward political opposites. The extent to which participants feel anger toward their political opposites was assessed using three items. The first item assessed anger toward an

opposing political party: “When I think about the major political party (Republican, Democratic, etc.) I most disagree with, I feel…” The second item assessed anger toward politicians from an opposing political party: “When I think about prominent politicians I disagree with, I feel…” The third item assessed anger toward members of an opposing political party: “When I imagine conversing about politics with someone who identifies with the major political party (Republican or Democratic) I most disagree with, I feel…” For each of these three items, participants were asked to use a 10-point slider scale ranging from “not angry at all” to “extremely angry” to rate the degree to which they experienced anger in reaction to the item. The three items were averaged to create one scale measure of anger toward political opposites. Cronbach’s alpha for this scale was 0.89, $M = 5.27$, $SD = 2.53$.

Anger toward oppositional social media content. The extent to which participants feel anger when confronted with oppositional social media content was measured using three items. The first item assessed the degree to which participants experience anger in reaction to counter-attitudinal political posts on social media: “When you see political opinions you disagree with on social media, how do you tend to feel?” The second item assessed the degree to which participants experience anger in reaction to political posts from oppositional politicians on social media: “When you see posts from politicians you disagree with on social media, how do you tend to feel?” The third item assessed the degree to which participants experience anger when conversing with those whom they disagree with politically on social media: “When you discuss (or imagine discussing) political issues with people you disagree with on social media, how do you tend to feel?” For each of these three items, participants were asked to use a 10-point slider scale ranging from “not angry at all” to “extremely angry” to rate their anger. Items were

averaged to create one scale measure of anger toward oppositional social media content. Cronbach's alpha for this scale was 0.94, $M = 4.82$, $SD = 2.43$.

Outcome Variable

Ideological polarization. Ideological polarization was measured using two items. The first items investigated participants' social views by asking them to respond to the following item: "I consider my views on social issues to be…" Participants responded to this prompt on a nine-point Likert scale (1 = "extremely conservative" 2 = "very conservative" 3 = "conservative" 4 = "slightly conservative" 5 = "neither conservative nor liberal" 6 = "slightly liberal" 7 = "liberal" 8 = "very liberal" 9 = extremely liberal"). The second item assessed participants' fiscal views by asking them to respond to the following item: "I consider my views on fiscal issues to be…" Participants similarly responded to this item on a nine-point Likert scale from "extremely conservative" to "extremely liberal." In order to create the scale measure, these two items were averaged. The Cronbach's alpha for this scale was .90. Then, because we are interested in how far to one side or the other a participant's views lie, participants' average scores on these two items were re-coded in the following manner: 1 and 9 = 9, 1.5 and 8.5 = 8, 2 and 8 = 7, 2.5 and 7.5 = 6, 3 and 7 = 5, 3.5 and 6.5 = 4, 4 and 6 = 3, 4.5 and 5.5 = 2, 5 = 1. This resulted in a nine-point scale measuring ideological polarization, $M = 4.70$, $SD = 2.53$. Using this method, participants who indicated that they were extremely liberal or conservative rated high on the scale, while those who indicated little or no ideological preference rated low on the scale.

Results

The researchers used IBM SPSS software version 27 to perform statistical analyses. In order to investigate the relationships between the variables, a bivariate correlation matrix was generated (see Table 2). The results of this correlation matrix were used to assess RQ1 – RQ4.

RQ1 asked whether incidental exposure to pro-attitudinal political content on social media would be positively associated with ideological polarization. A Pearson's correlation analysis was conducted to examine the relationship between these two variables. The analysis showed a statistically significant positive relationship, $r(411) = .25$, $p < .001$. Therefore, RQ1 was answered in the affirmative.

RQ2 asked whether selective exposure to pro-attitudinal political content on social media would be positively associated with ideological polarization. A Pearson's correlation analysis was conducted to examine the relationship between these two variables. The analysis showed a statistically significant positive relationship, $r(412) = .17$, $p < .001$. Therefore, RQ2 was answered in the affirmative.

RQ3 asked whether incidental exposure to counter-attitudinal political content would be positively associated with ideological polarization. A Pearson's correlation analysis was conducted to examine the relationship between these two variables. The analysis showed a statistically significant positive relationship, $r(411) = .18$, $p < .001$. Therefore, RQ3 was answered in the affirmative.

RQ4 asked whether selective exposure to counter-attitudinal political content would be positively associated with ideological polarization. A Pearson's correlation analysis was conducted to examine the relationship between these two variables. The analysis showed a non-significant relationship, $r(409) = .06$, $p = .244$. Therefore, RQ4 was answered in the negative.

In order to address H1 – H8, eight hierarchical regression analyses were conducted using Andrew Hayes' PROCESS, an SPSS macro that tests for indirect effects. All tests were conducted using Model 4, a simple mediation model in PROCESS. According to previous recommendations, the analysis used 5000 bootstrap samples and 95% confidence intervals. Heteroscedasticity-consistent inference was set to HC4 (Cribari-Neto), conditioning values were set to 16th, 50th, and 84th percentiles, and no centering was used for construction of products. In each of the mediation tests, a number of covariates were included in the model. These were age, gender, education, and frequency of social media use. The results of the following mediation tests are presented in Table 4.

To test H1 (i.e. anger toward political opposites will mediate the relationship between incidental exposure to pro-attitudinal political content on social media and ideological polarization) a simple mediation test was conducted. Incidental exposure to pro-attitudinal content (x) predicted anger toward political opposites (m) along path A at a significant value, r = .29, p < .001, b = .52, t(388) = 4.80, p < .001. Controlling for x, the mediator then affected ideological polarization (y) along path B at a significant value, r = .38, p < .001, b = .25, t(388) = 4.80, p < .001. Finally, incidental exposure to pro-attitudinal content (x) predicted ideological polarization (y) along path C' at a significant value, r = .28, p < .001, b = .42, t(388) = 4.22, p < .001. The results of this test showed that anger toward political opponents partially mediated the relationship between incidental exposure to pro-attitudinal content and ideological polarization (b = .13, 95% *CI:* .06 to .21). Therefore, H1 was supported (see Figure 1).

To test H2 (i.e. anger toward oppositional social media content will mediate the relationship between incidental exposure to pro-attitudinal political content on social media and ideological polarization) a simple mediation test was conducted. Incidental exposure to pro-

attitudinal content (x) predicted anger toward oppositional social media content (m) along path A at a significant value, $r = .27$, $p < .001$, $b = .32$, $t(385) = 3.20$, $p = .002$. Controlling for x, the mediator then affected ideological polarization (y) along path B at a significant value, $r = .34$, $p < .001$, $b = .19$, $t(385) = 3.60$, $p < .001$. Finally, incidental exposure to pro-attitudinal content (x) predicted ideological polarization (y) along path C' at a significant value, $r = .30$, $p < .001$, $b = .44$, $t(385) = 4.38$, $p < .001$. The results of this test showed that anger toward oppositional social media content partially mediated the relationship between incidental exposure to pro-attitudinal content and ideological polarization ($b = .06$, 95% *CI:* .02 to .12). Therefore, H2 was supported (see Figure 2).

To test H3 (i.e. anger toward political opposites will mediate the relationship between selective exposure to pro-attitudinal political content on social media and ideological polarization) a simple mediation test was conducted. Selective exposure to pro-attitudinal content (x) predicted anger toward political opposites (m) along path A at a significant value, $r = .31$, $p < .001$, $b = .44$, $t(389) = 5.83$, $p < .001$. Controlling for x, the mediator then affected ideological polarization (y) along path B at a significant value, $r = .36$, $p < .001$, $b = .27$, $t(389) = 5.04$, $p < .001$. Finally, selective exposure to pro-attitudinal content (x) predicted ideological polarization (y) along path C' at a significant value, $r = .25$, $p < .001$, $b = .24$, $t(389) = 3.06$, $p = .002$. The results of this test showed that anger toward political opposites partially mediated the relationship between selective exposure to pro-attitudinal content and ideological polarization ($b = .12$, 95% *CI:* .06 to .19). Therefore, H3 was supported (see Figure 3).

To test H4 (i.e. anger toward oppositional social media content will mediate the relationship between selective exposure to pro-attitudinal political content on social media and ideological polarization) a simple mediation test was conducted. Selective exposure to pro-

attitudinal content (x) predicted anger toward oppositional social media content (m) along path A at a significant value, $r = .31$, $p < .001$, $b = .36$, $t(386) = 4.70$, $p < .001$. Controlling for x, the mediator then affected ideological polarization (y) along path B at a significant value, $r = .31$, $p < .001$, $b = .20$, $t(386) = 3.67$, $p < .001$. Finally, selective exposure to pro-attitudinal content (x) predicted ideological polarization (y) along path C' at a significant value, $r = .25$, $p < .001$, $b = .24$, $t(386) = 3.00$, $p < .001$. The results of this test showed that anger toward oppositional social media content partially mediated the relationship between selective exposure to pro-attitudinal content and ideological polarization ($b = .07$, 95% *CI:* .03 to .13). Therefore, H4 was supported (see Figure 4).

To test H5 (i.e. anger toward political opposites will mediate the relationship between incidental exposure to counter-attitudinal political content on social media and ideological polarization) a simple mediation test was conducted. Incidental exposure to counter-attitudinal content (x) predicted anger toward political opposites (m) along path A at a significant value, $r = .25$, $p < .001$, b = .36, $t(387) = 3.58$, $p < .001$. Controlling for x, the mediator then affected ideological polarization (y) along path B at a significant value, $r = .36$, $p < .001$, $b = .28$, $t(387) = 5.44$, $p < .001$. Finally, incidental exposure to counter-attitudinal content (x) predicted ideological polarization (y) along path C' at a significant value, $r = .24$, $p < .001$, $b = .26$, $t(387) = 2.60$, $p = .01$. The results of this test showed that anger toward political opposites partially mediated the relationship between incidental exposure to counter-attitudinal content and ideological polarization ($b = .10$, 95% *CI:* .04 to .18). Therefore, H5 was supported (see Figure 5).

To test H6 (i.e. anger toward oppositional social media content will mediate the relationship between incidental exposure to counter-attitudinal political content on social media

and ideological polarization) a simple mediation test was conducted. Incidental exposure to counter-attitudinal content (x) predicted anger toward oppositional social media content (m) along path A at a significant value, $r = .31$, $p < .001$, b = .38, $t(384) = 4.03$, $p < .001$. Controlling for x, the mediator then affected ideological polarization (y) along path B at a significant value, $r = .31$, $p < .001$, $b = .20$, $t(384) = 3.86$, $p < .001$. Finally, incidental exposure to counter-attitudinal content (x) predicted ideological polarization (y) along path C' at a significant value, $r = .325$, $p < .001$, $b = .27$, $t(384) = 2.74$, $p = .006$. The results of this test showed that anger toward oppositional social media content partially mediated the relationship between incidental exposure to counter-attitudinal content and ideological polarization ($b = .08$, 95% *CI:* .03 to .14). Therefore, H6 was supported (see Figure 6).

To test H7 (i.e. anger toward political opposites will mediate the relationship between selective exposure to counter-attitudinal political content on social media and ideological polarization) a simple mediation test was conducted. Selective exposure to counter-attitudinal content (x) predicted anger toward political opposites (m) along path A at a significant value, $r = .21$, $p = .006$, $b = .30$, $t(387) = 3.40$, $p < .001$. Controlling for x, the mediator then affected ideological polarization (y) along path B at a significant value, $r = .34$, $p < .001$, $b = .30$, $t(387) = 5.70$, $p < .001$. Finally, selective exposure to counter-attitudinal content (x) predicted ideological polarization (y) along path C' at a significant value, $r = .18$, $p = .031$, $b = .09$, $t(387) = 1.01$, $p = .314$. The results of this test showed that anger toward political opposites fully mediated the relationship between selective exposure to counter-attitudinal content and ideological polarization ($b = .13$, 95% *CI:* .06 to .21). Therefore, H7 was supported (see Figure 7).

To test H8 (i.e. anger toward oppositional social media content will mediate the relationship between selective exposure to counter-attitudinal political content on social media

and ideological polarization) a simple mediation test was conducted. Selective exposure to counter-attitudinal content (x) predicted anger toward oppositional social media content (m) along path A at a significant value, $r = .25$, $p < .001$, b = .23, $t(384) = 2.67$, $p = 008$. Controlling for x, the mediator then affected ideological polarization (y) along path B at a significant value, $r = .28$, $p < .001$, $b = .22$, $t(384) = 4.18$, $p < .001$. Finally, selective exposure to counter-attitudinal content (x) predicted ideological polarization (y) along path C' at a significant value, $r = .18$, $p = .031$, $b = .08$, $t(384) = .93$, $p = .353$. The results of this test showed that anger toward oppositional social media content partially mediated the relationship between selective exposure to counter-attitudinal content and ideological polarization ($b = .05$, 95% *CI:* .01 to .10). Therefore, H8 was supported (see Figure 8).

Discussion

This study investigated the relationships between four types of political content exposure on social media (pro-attitudinal incidental exposure, pro-attitudinal selective exposure, counter-attitudinal incidental exposure, and counter-attitudinal selective exposure), the mediating variables of a) anger toward political opposites and b) anger toward oppositional social media content, and the outcome variable of ideological polarization. In order to address the main implications of this paper, we will review the findings associated with each of the four explanatory variables and discuss how these findings relate and add to existing research and theory.

The first two explanatory variables were pro-attitudinal incidental exposure and pro-attitudinal selective exposure. Both variables were positively correlated with ideological polarization. This finding gives some credence to concerns that repeated exposure to pro-attitudinal online political content may be partially responsible for polarization (Pariser, 2011). Further, this finding suggests that both a) having a social media feed that frequently shows pro-attitudinal political content and b) using social media to intentionally seek out pro-attitudinal views may encourage more polarized views. This supports the hypothesis of both the echo chamber theory and the filter bubble (Pariser, 2011) that pro-attitudinal content exposure is linked to polarization and supports a variety of other research which has demonstrated this relationship (Kim, 2015; Lu & Lee, 2018; Stroud, 2010; Tewskbury & Riles, 2015). However, it does not confirm the hypothesis of the echo chamber and filter bubble theories that the underlying cause of polarization outcomes is that social media users have homogenous feeds. First, our correlation matrix showed a strong relationship between incidental exposure to pro-attitudinal content and incidental exposure to counter-attitudinal content, suggesting that users

who frequently see pro-attitudinal views on their feeds also often see counter-attitudinal views. This supports the results of many other scholars who have discovered that users tend to have heterogeneous feeds (Beam et al., 2018; Nelson & Webster, 2017) and adds to the litany of data showing concerns of overly homogenous social media feeds may be overstated (Garrett et al., 2013; Masip et al., 2010). Second, in addition to both forms of pro-attitudinal content exposure being linked to polarization, our results showed that incidental *counter*-attitudinal exposure was also linked to polarization, suggesting that the exposure to cross-cutting views that comes with a more heterogenous social media feed may also be linked to polarization. This finding will be discussed in further detail later. Finally, it should be noted that, due to the cross-sectional nature of the data, it is possible that those who are more ideologically extreme enjoy consuming affirming political content more than those who are more ideologically neutral. This would support the work of previous work which has found that preferences for pro-attitudinal content are especially pronounced when prior attitudes and preferences are strongly held (Brannon et al., 2007; Knobloch-Westerwick & Meng; 2009).

It is also important to note that the positive correlation between pro-attitudinal incidental exposure and ideological polarization was stronger than the correlation between pro-attitudinal selective exposure and the outcome variable. This suggests that intentionally seeking out pro-attitudinal content on social media may have less of an impact on polarization than having a social media feed where pro-attitudinal content frequently appears. This may be because users tend to consume more political content through incidental means than selective means, making the incidental effects of social media use stronger. This possibility should be explored in future research.

Anger toward political opposites and anger toward oppositional social media content partially mediated the relationships between both incidental and selective exposure to pro-attitudinal content and ideological polarization. Further, for both of these explanatory variables, anger toward political opposites had a stronger indirect effect on the outcome that anger toward oppositional social media content. These results support findings linking online political content exposure to anger (Hasell & Weeks, 2016; Lee & Kwak, 2014) and linking anger to polarization outcomes (Gervais, 2017; Huber et al., 2015; Webster, 2018; Weeks, 2015). Further, the results emphasize that even exposure to online political content a user agrees with may affect politically oriented anger, contradicting some previous evidence (Gervais, 2017). Due to the high degree of angry sentiment in online spaces (Fan et al., 2014; Fan et al., 2016;) and in online political posts, specifically (Roberts et al., 2012; Wagner & Boczkowski, 2019), it seems likely that many pro-attitudinal posts exhibit some level of anger, perhaps by referencing "the other" or criticizing views espoused by the other side. Our findings suggest that, as a result of frequent exposure to these pro-attitudinal posts, users may tend to respond more angrily to oppositional political posts and—to perhaps an even greater degree—develop stronger feelings of anger toward their political opposites. These findings have direct implications for the echo chamber and filter bubble theories. Specifically, we propose that when users experience an echo chamber effect online, this effect takes place partially through the induction of politically oriented anger. Users may be exposed to pro-attitudinal content which affects feelings of anger toward both oppositional content and political opposites; this anger, in turn, may affect the ideological leanings of users as they desire to retreat from the views of those toward whom they hold feelings of anger. Therefore, future research involving the effects of pro-attitudinal exposure on social media users should take the role of anger into account.

The other two explanatory variables investigated in this study were counter-attitudinal incidental exposure and counter-attitudinal selective exposure. While counter-attitudinal incidental exposure was positively correlated with ideological polarization, counter-attitudinal selective exposure was not significantly correlated with the outcome variable. This first finding—that counter-attitudinal incidental exposure predicts polarization to some degree—is interesting in that it contradicts the echo chamber theory concept that it is predominately online homophily which creates polarization. The finding also provides some support for the existence of online backfire effects (Lewandowsky et al., 2012; Nyhan & Reifler, 2010). Similar to the findings of Lee et al. (2014) and Bail et al. (2018), who found that exposure to cross-cutting views on social media can actually increase ideological polarization, our results show that being incidentally exposed to counter-attitudinal views online does not create more neutral beliefs in users, but rather may create increased polarization. The answer for why this relationship occurs may be partially found in the mediation results for this relationship, which showed that both anger toward political opposites and anger toward oppositional social media content partially mediated the relationship between incidental counter-attitudinal exposure and polarization. This result indicates that exposure to cross-cutting views online—which may often be angry or critical in tone (Roberts et al., 2012)—may prompt higher levels of political anger in users, which in turn creates ideological polarization, thus explaining one mechanism by which the backfire effect occurs.

Also important to ongoing conceptions of the backfire effect is the result that counter-attitudinal selective exposure was not significantly linked to the outcome of polarization. This indicates that, when users actively seek out contradicting opinions on social media, a backfire effect may be less likely to occur. It may be that, by selectively choosing what cross-cutting

content to expose themselves to, users are able to choose more moderate, less inflamed counter-attitudinal views. Conversely, it may also be that those who seek out political opinions from political opponents have a genuine interest in the politics of the opposing side and thus are more likely to hold more neutral ideological views, while those who are more ideologically extreme may have less desire to engage with oppositional content. More research should be conducted to determine why this relationship may not materialize; however, what this finding does indicate is that it is possible to engage in cross-cutting content on social media in a way that does not result in ideological polarization. This finding supports previous research which has expressed skepticism of the backfire effect (Wood & Porter, 2019) or indicated that exposure to counter-attitudinal content can cause social media users to change their opinions on a political issue (Duggan & Smith, 2016).

The mediation results for counter-attitudinal selective exposure add some nuance to the above finding and shed light on the conditions under which backfire effects occur. Results showed that both anger toward political opposites and anger toward oppositional social media content fully mediated the relationship between counter-attitudinal selective exposure and polarization. This shows that, while many users selectively expose themselves to counter-attitudinal content without experiencing a backfire effect, those who have high levels of politically oriented anger may experience this effect. This finding may be explained through the concept of biased assimilation (Suhay & Erisen, 2018). Previous work has shown that people are more likely to engage in biased assimilation when they have high levels of anger (Suhay & Erisen, 2018, Knobloch-Westerwick et al, 2020; Weeks et al., 2015). Therefore, it may be that when those with high levels of political anger—and especially anger toward political opposites—seek out opposing views on social media, seeing these views only serves to elicit anger, prompt

biased assimilation of the content, and result in ideological polarization. This sort of process may occur when, for example, a social media user seeks out the posts of a politician they dislike, digests the content in a biased manner, and experiences anger toward the politician and the views they espouse. Over time, this may result in increased anger toward political opposites generally and may cause users to wish to retreat further from the views of those with whom they disagree.

Conclusion

The findings of this study generally confirm the importance of anger in political activity and content consumption (Ost, 2004; Wagner & Boczkowski, 2019). Most importantly, this study suggests that, whether they are incidentally or selectively exposed to pro- or counter-attitudinal political content, social media users who are heavily exposed to this content may develop more polarized views if they develop stronger feelings of politically oriented anger as a result of this content exposure. This suggests that the polarization outcomes hypothesized by both the echo chamber theory and the backfire effect can be realized under the condition of political anger.

The findings of this study suggest that future researchers should continue to investigate the role that anger plays in experiences with political content on social media. Due to the cross-sectional nature of the data, the causal claims made in this paper, though based in theory, cannot be fully supported. Therefore, future research should also investigate the potential for pro- and counter- attitudinal political content to elicit politically oriented anger and in turn affect polarization using experimental methods. The results of this study should be considered in light of a few limitations. In addition to being limited by its cross-sectional data, this study is also limited by the typical limitations of online survey research (LeFever et al., 2007) and of the Amazon Mechanical Turk platform (Aust et al., 2013; Buhrmester et al., 2011). Further, it is possible that individuals who are more interested in politics may have been more likely to respond to the survey. Finally, this study rests on the assumption that the mere act of prompting individuals to think about politics can elicit feelings of anger (Webster, 2018).

The findings of this research are of interest to users of social media, media educators, and to the social media companies whose algorithms determine feeds. Users of social media should

be aware of the emotional effects of both pro- and counter- attitudinal political content on social media and should be advised to examine their emotional reactions—especially negative reactions—to this content. It may be helpful for media literacy campaigns, in addition to teaching students how to recognize reliable and unreliable information, to teach media consumers to check their emotional responses to online political content and ponder the causes of those reactions. Causes may stem from legitimate policy concerns or may from the emotional language employed in political posts (Roberts et al., 2012), rather than their substance. Social media companies, some of whom are considering providing further customization options that allow users to view less political content (Roos & Isaac, 2021), should also be aware that both pro- and counter-attitudinal content may result in politically oriented anger and polarization and take this into account in their decision making.

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Appendix A—Tables

Table 1

Sample characteristics

Demographic	
Age	*M* = 38.9 (*SD* = 10.6)
Race	
White	326 (78.7%)
Black or African American	44 (10.6%)
American Indian or Alaska Native	6 (1.4%)
Asian	36 (8.7%)
Native Hawaiian or Pacific Islander	1 (0.2%)
Other	8 (1.9%)
Ethnicity	
Spanish, Hispanic, or Latino	31 (7.5%)
None of the above	382 (92.3%)
Gender	
Male	220 (53.1%)
Female	186 (44.9%)
Non-binary	3 (0.7%)
Prefer not to say	5 (1.2%)
Education	
Less than high school degree	3 (0.7%)
High school graduate (high school diploma or equivalent including GED)	41 (9.9%)
Some college but no degree	63 (15.2%)
Associate degree in college (2-year)	42 (10.1%)
Bachelor's degree in college (4-year)	186 (44.9%)
Master's degree	59 (14.3%)
Doctoral degree	7 (1.7%)
Professional degree (JD, MD)	12 (2.9%)
Party Affiliation	
Republican	98 (23.7%)
Democrat	207 (50.0%)
Independent	97 (23.4%)

Other	7 (1.7%)
No preference	5 (1.2%)
Frequency of Social Media Use	
Monthly	9 (2.2%)
A few times a month	7 (1.7%)
Weekly	15 (3.6%)
A few times a week	38 (9.2%)
Daily	133 (32.1%)
Several times a day	212 (51.2%)
Daily Hours on Social Media	
Less than 30 minutes	79 (19.1%)
30 minutes – 1 hour	143 (34.5%)
1-2 hours	93 (22.5%)
2-3 hours	58 (14%)
3-4 hours	17 (4.1%)
4+ hours	24 (5.8%)

Note: Participants were able to select more than one race

Table 2

Bivariate correlation matrix

		1	2	3	4	5	6	7
1	IEPC							
2	IECC	.54**						
3	SEPC	.33**	.21**					
4	SECC	.22**	.29**	.67**				
5	AOC	.23**	.27**	.24**	.13*			
6	APO	.27**	.23**	.27**	.16**	.75**		
7	Ideological polarization	.25**	.18**	.17**	.06	.22**	.29**	

**Correlation is significant at the 0.01 level

*Correlation is significant at the 0.05 level

IEPC: Incidental exposure to pro-attitudinal content
IECC: Incidental exposure to counter-attitudinal content
SEPC: Selective exposure to pro-attitudinal content
SECC: Selective exposure to pro-attitudinal content
AOC: Anger toward oppositional content on social media
APO: Anger toward political opposites

Table 3

Means and standard deviations

	M	*SD*
IEPC	4.16	1.37
IECC	4.02	1.44
SEPC	3.09	1.72
SECC	2.38	1.48
AOC	5.27	2.53
APO	4.82	2.43
Ideological Polarization	4.7	2.53

Table 4

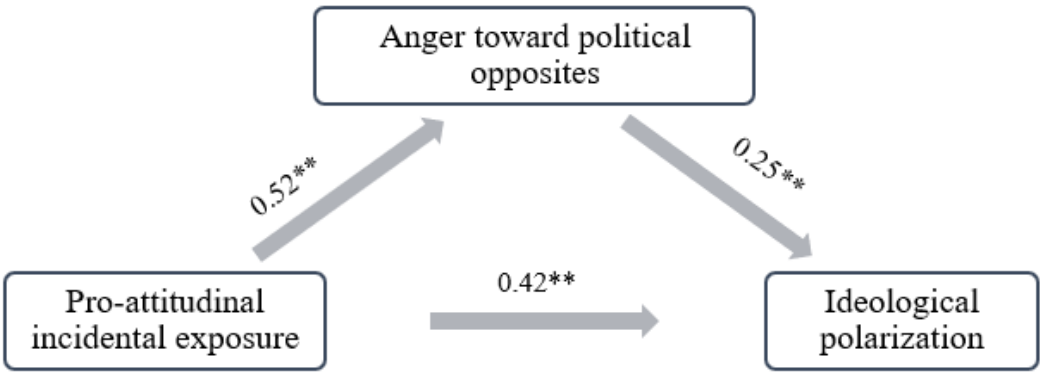
Indirect effects of explanatory variables on ideological polarization via mediators

Mediation Path	Indirect effect Bootstrap Estimate (*b*)	Indirect effect 95% C.I. LL	UL
Pro-attitudinal incidental exposure → anger toward political opposites → ideological polarization	0.13	0.06	0.21
Pro-attitudinal incidental exposure → anger toward oppositional social media content → ideological polarization	0.06	0.02	0.12
Pro-attitudinal incidental exposure → anger toward political opposites → ideological polarization	0.12	0.6	0.19
Pro-attitudinal incidental exposure → anger toward oppositional social media content → ideological polarization	0.07	0.03	0.13
Pro-attitudinal incidental exposure → anger toward political opposites → ideological polarization	0.1	0.04	0.18
Pro-attitudinal incidental exposure → anger toward oppositional social media content → ideological polarization	0.08	0.03	0.14
Pro-attitudinal incidental exposure → anger toward political opposites → ideological polarization	0.13	0.06	0.21
Pro-attitudinal incidental exposure → anger toward oppositional social media content → ideological polarization	0.05	0.01	0.1

Appendix B—Figures

Figure 1

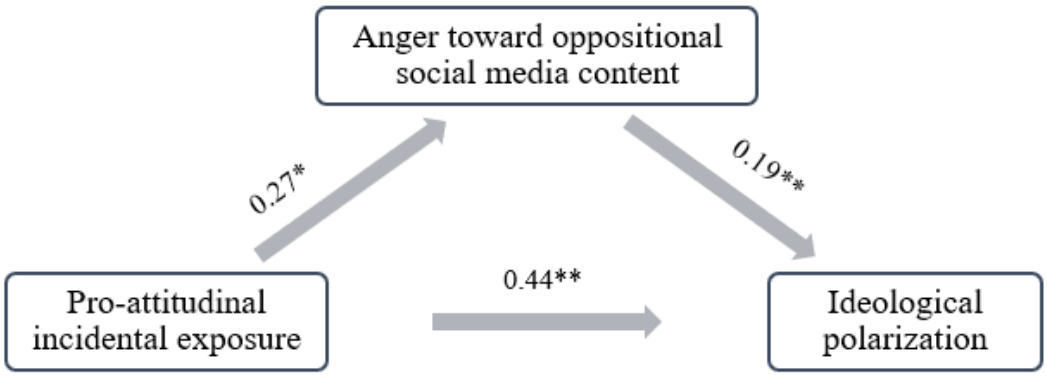
Anger toward political opposites mediates the relationship between pro-attitudinal incidental exposure and ideological polarization.



**p < .001 *p < .01

Figure 2

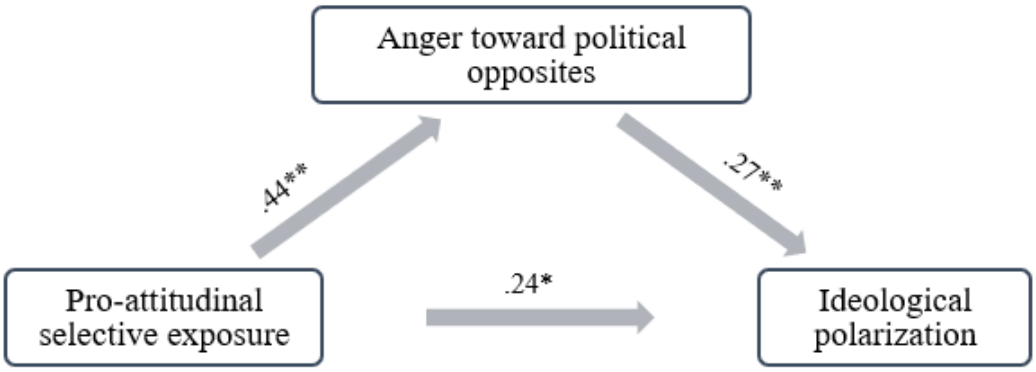
Anger toward oppositional social media content mediates the relationship between pro-attitudinal incidental exposure and ideological polarization.



**p < .001 *p < .01

Figure 3

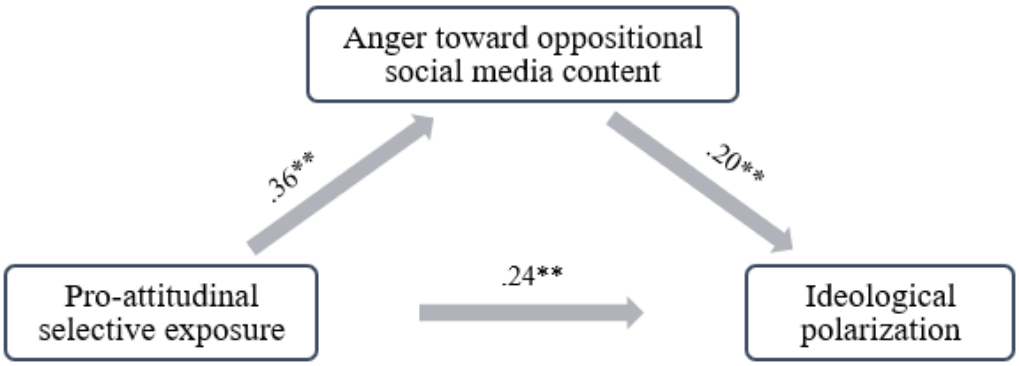
Anger toward political opposites mediates the relationship between pro-attitudinal selective exposure and ideological polarization.



**p < .001 *p < .01

Figure 4

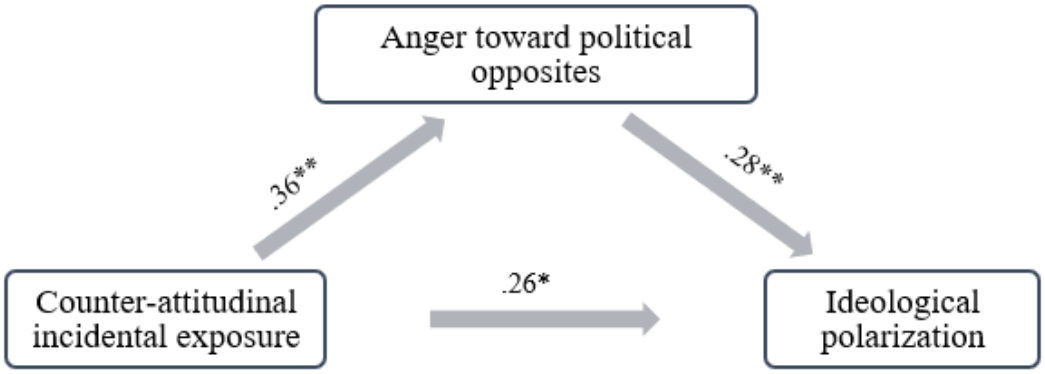
Anger toward oppositional social media content mediates the relationship between pro-attitudinal selective exposure and ideological polarization.



**p < .001 *p < .01

Figure 5

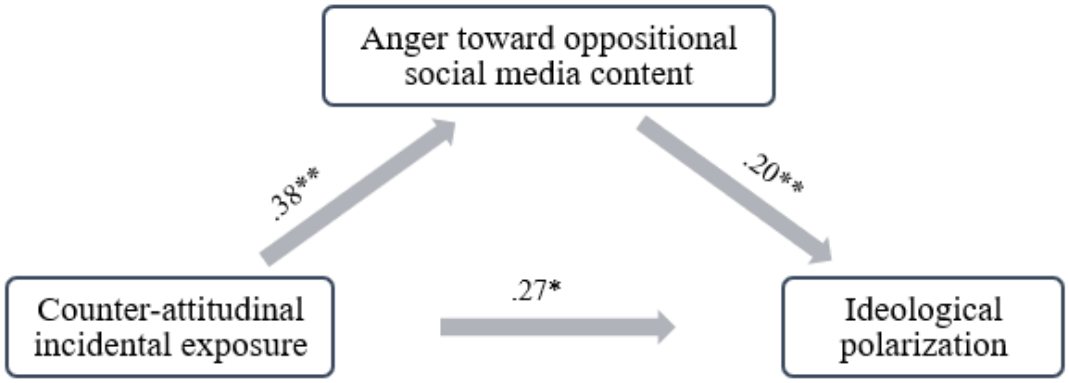
Anger toward political opposites mediates the relationship between counter-attitudinal incidental exposure and ideological polarization.



**p < .001 *p < .01

Figure 6

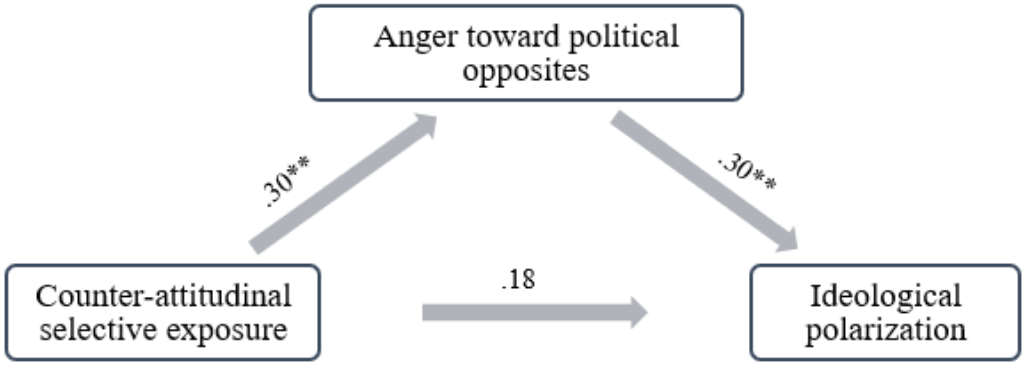
Anger toward oppositional social media content mediates the relationship between counter-attitudinal incidental exposure and ideological polarization.



**p < .001 *p < .01

Figure 7

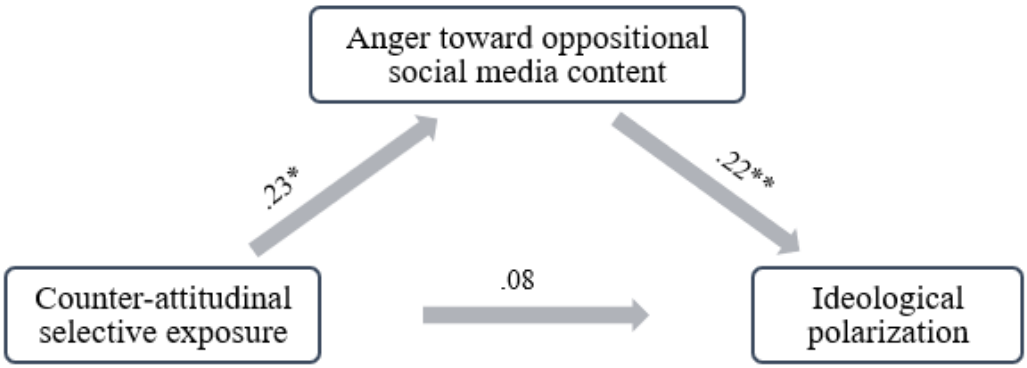
Anger toward political opposites mediates the relationship between counter-attitudinal selective exposure and ideological polarization.



**p < .001 *p < .01

Figure 8

Anger toward oppositional social media content mediates the relationship between counter-attitudinal selective exposure and ideological polarization.



**p < .001 *p < .01

Appendix C—Survey

1. Do you currently have an account on at least one social media platform (e.g. Facebook, Instagram, Twitter, etc.) that you access at least once a month?
    - Yes
    - No

      [If no, survey ends]

2. Sometimes people intentionally search for certain political opinions or news on social media. In the past month, how often have you **intentionally searched for content** on social media that...

   a) was positive toward a candidate you support
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

   b) was critical of a candidate you oppose
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

   c) supported your political views
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

3. In the past month, how often have you **intentionally searched for content** on social media that…

   a) was critical of a candidate you support
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

   b) was favorable toward a candidate you oppose
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

   c) disagreed with your political views
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

4. Sometimes people come across political opinions or news on social media that they did not *intentionally* seek out. In the past month, how often have you **unintentionally encountered content** on social media that…

   a) was positive toward a candidate you support
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

   b) was critical of a candidate you oppose
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

   c) supported your political views
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

5. In the past month, how often have you **unintentionally encountered content** on social media that…

   a) was critical of a candidate you support
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

   b) was favorable toward a candidate you oppose
   - Not at all, about once, 2-3 times, once a week, a few times a week, every day

c) disagreed with your political views
- Not at all, about once, 2-3 times, once a week, a few times a week, every day

The following questions will ask you to think about how you typically feel when you see political content that you disagree with on social media.

6. When I encounter political opinions I disagree with on social media, I tend to feel…
   - 10-point slider scale: "Not angry at all" to "extremely angry"

7. When I see posts from U.S. politicians I typically disagree with on social media, I tend to feel…
   - 10-point slider scale: "Not angry at all" to "extremely angry"

8. When I discuss political issues with people I disagree with on social media, I tend to feel…
   - 10-point slider scale: "Not angry at all" to "extremely angry"

The following questions will ask you to think about how you feel when you think about certain groups or situations.

9. When I think about the major political party (Republican or Democrat) I most disagree with, I feel…
   - 10-point slider scale: "Not angry at all" to "extremely angry"

10. When I think about prominent U.S. politicians I typically disagree with, I feel…
    - 10-point slider scale: "Not angry at all" to "extremely angry"

11. When I imagine conversing about politics with someone who identifies with the major political party (Republican or Democrat) I most disagree with, I feel…
    - 10-point slider scale: "Not angry at all" to "extremely angry"

12. When I think about the mainstream media, I feel…
    - 10-point slider scale: "Not angry at all" to "extremely angry"

13. How often do you use social media?
    - Monthly
    - A few times a month
    - Weekly
    - A few times a week
    - Daily
    - Several times a day

14. How many hours per day do you typically spend on social media?
    - Less than 30 minutes
    - 30 minutes - 1 hour

- 1-2 hours
- 2-3 hours
- 3+ hours

15. What is your gender?
    - Male
    - Female
    - Gender Variant/Non-Conforming
    - Not Listed
      _____ (write in)
    - Prefer Not to Answer

16. How old are you?
    [Drop down menu]

17. Please specify your race (select all that apply)
    - White
    - Black or African American
    - American Indian or Alaska Native
    - Asian Indian
    - Japanese
    - Native Hawaiian
    - Guamanian or Chamorro
    - Filipino
    - Vietnamese
    - Samoan
    - Other Asian
    - Other Pacific Islander
    - Some Other Race
      _____ (write in)

18. Are you of Hispanic, Latinx, or Spanish origin?
    - No, not of Hispanic, Latinx, or Spanish origin
    - Yes, Mexican, Mexican American, Chicano
    - Yes, Puerto Rican
    - Yes, Cuban
    - Yes, another Hispanic, Latinx, or Spanish origin (for example, Argentinean, Colombian, Dominican, Nicaraguan, Salvadorian, etc.)

19. What is the highest level of school you have completed or the highest degree you have received?
    - Less than high school degree
    - High school graduate (high school diploma or equivalent including GED)
    - Some college but no degree
    - Associate degree in college (2-year)
    - Bachelor's degree in college (4-year)

- Master's degree
- Doctoral degree
- Professional degree (JD, MD)

The questions below ask you to assess where you would place yourself on an ideological scale from extremely conservative to extremely liberal.

20. I consider my views on social issues to be…
    - Extremely conservative
    - Very conservative
    - Conservative
    - Slightly conservative
    - Neither conservative nor liberal
    - Slightly liberal
    - Liberal
    - Very liberal
    - Extremely liberal

21. I consider my views on fiscal issues to be…
    - Extremely conservative
    - Very conservative
    - Conservative
    - Slightly conservative
    - Neither conservative nor liberal
    - Slightly liberal
    - Liberal
    - Very liberal
    - Extremely liberal

22. Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent, or something else?
    - Republican
    - Democrat
    - Independent
    - Other
      _____ (write in)
    - No preference

23. How important to you is your party identity (Republican, Democrat, etc.)?
    - Not at all important, somewhat important, important, very important, extremely important

24. How important to you is your ideological identity (conservative, liberal, etc.)?
    - Not at all important, somewhat important, important, very important, extremely important