Confirmation Biases in Selective Exposure to Political Online Information:

Source Bias Versus Content Bias

Abstract

The present work examines the role of source versus content cues for the confirmation bias, in which recipients spend more time with content aligning with preexisting attitudes. In addition to testing how both source and content cues facilitate this biased pattern of selective exposure, the study measures subsequent attitude polarization. An experiment ($N = 120$) presented messages with opposing political stances, associated with unbiased or slanted sources. Software tracked selective exposure in seconds, and attitudes were measured before, immediately after, and two days after message exposure. Further, information processing styles were assessed. The confirmation bias emerged regardless of source quality. Information processing styles moderated the confirmation bias as well as selective exposure to messages from unbiased vs. slanted sources. Selective exposure reinforced attitudes days later.

Keywords: selective exposure, confirmation bias, source cues, partisan media, attitudes, political communication, online search, polarization

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Much concern exists over polarization of the electorate, in which political attitudes and intolerance toward politicians and partisans of a nonfavored party become increasingly extreme (e.g., Abramowitz & Saunders, 2008). Polarization hinders effective democratic discourse in the interest of solving societal problems, in particular, as a result of the internet becoming a key channel in distribution and seeking of political information (e.g., Bennett & Iyengar, 2008). Even President Barack Obama has commented "[I]f we choose only to expose ourselves to opinions and viewpoints that are in line with our own, […] we become more polarized […]. That will only reinforce and even deepen the political divides in this country" (The White House, 2010).

The term *confirmation bias* pertains to the phenomenon that individuals select messages more frequently or spend disproportionately more time with messages that align with preexisting opinions over information that challenges preexisting views (Stroud, 2008). On the other hand, the broader term *selective exposure* denotes that individuals selectively attend to messages they can choose from and do not spend equal times with all available messages (Knobloch-Westerwick, 2015). The present work extends confirmation bias research by emphasizing the important distinction between source and message content—different "communication inputs" per classic conceptualizations of persuasion (McGuire, 1989). It is proposed that the confirmation bias may have different outcomes with regard to processing and attitude impacts depending on whether source cues or content cues guide related selective exposure. Hence, the current investigation disentangles impacts of source and content cues on a confirmation bias but will also examine impacts of selective exposure to political messages on attitudes because research on this bias is often motivated by concerns about its possible polarizing effects.

In the following, we apply a persuasion perspective to the confirmation bias and its consequences, while measuring selective exposure unobtrusively and not via self-report (as suggested by Prior, 2013). Second, we elaborate the argument on why source and content must be carefully differentiated and review how prior research conceptualized the confirmation bias. Differentiation between content cues' and source cues' impacts will ultimately help to reconcile inconsistent prior findings in the flourishing research on selective exposure to political messages and subsequent impacts on attitudes, as elucidated in the discussion section.

A Persuasion Perspective on the Confirmation Bias and Its Consequences

Americans are thought to become more polarized in their political views (e.g., Layman, Carsey, & Horowitz, 2006), due in large part to the rise of more partisan, slanted news outlets (e.g., Iyengar & Hahn, 2009; Stroud, 2010). The assumption is that citizens are more likely to select news that bolsters their views rather than challenges them, exhibiting a confirmation bias in their selective exposure. This pattern, in turn, is thought to result in increasingly larger divisions in views and perceived social distance between parties (Garrett et al., 2014), which hinders effective, problem-solving political discourse. The mechanisms, however, through which political polarization then occurs are less clear (Prior, 2013).

To contribute to the understanding of polarization processes, we utilize a persuasion perspective and draw on a well-established framework in persuasion research—the elaboration likelihood model (ELM; Petty, Briñol, & Priester, 2009). At its core, the ELM suggests that attitude change occurs as a result of two different information processing modes—central versus peripheral. In information processing via the *central* route, when individuals are motivated and able to do so, they will engage carefully and thoroughly with the information in persuasive messages, reflect on it, connect it with preexisting cognitions, and integrate it into their overall

cognitive network. On the other hand, when lacking the motivation and ability for such effortful

consideration, recipients may engage in *peripheral* processing, not scrutinize the message

content much, and instead rely on context cues such as source credibility, which can also

produce attitude change. However, compared to the more effortful central processing, peripheral

processing does not produce lasting attitude change. Whether processing takes the central or the

peripheral route depends on individuals' motivation (e.g., personal relevance, need for cognition)

and ability (e.g., preexisting knowledge, attention resources). Content characteristics (e.g.,

argument quality) are more important for the central processing route, whereas source cues are

more important for the peripheral route (Petty, Kasmer, Haugtvedt, & Cacioppo, 1987). Hence,

individuals with lower motivation or ability to process information should be more strongly

guided by source cues than other recipients when selecting messages as well as when

incorporating newly acquired information into their views. Despite extensive research on

selective exposure and confirmation bias, the interest in how information processing styles and

abilities affect the phenomenon has been surprisingly scarce (exceptions exist for dogmatism,

authoritarianism, chronic anxiety, and repression/sensitization; see reviews by Hart et al., 2009;

Smith, Fabrigar, & Norris, 2008). The present study will thus consider information processing

motivation and ability as moderating individual differences.

Source vs. Content and the Confirmation Bias

Source as a concept is commonly emphasized in communication and persuasion research

(see meta-analyses by Kumkale & Albarracín, 2004; Pornpitakpan, 2004), going back to classic

work by Hovland and colleagues (Hovland, Janis, & Kelley, 1953; Hovland & Weiss, 1951).

Numerous studies investigated the role of the sources of messages on persuasion outcomes (e.g.,

Tormala, Briñol, & Petty, 2006; Tormala & Clarkson, 2007), highlighting the importance of

considering source and message content as separate constructs. Recent work even suggests that

perceived source credibility may be more important for selective exposure to political messages

than attitude reinforcement per confirmation bias (Metzger, Hartsell, & Flanagin, in press).

Confirmation bias studies can be categorized by their approaches into examination of (1)

self-reported bias, (2) ideological bias, (3) party bias, (4) news bias, and (5) content bias.

Regarding self-reported bias, many studies rely on self-reports and explicitly ask respondents

about the likelihood with which they would engage with sources that either align with or diverge

from their own political views[1] (e.g., Johnson & Kaye, 2013; Johnson, Zhang, & Bichard, 2011).

In a more nuanced approach of ideological bias, survey questions present examples of sources,

labeled specifically as "liberal" or "conservative" when asking about information use habits

(e.g., Garrett et al., 2013)[2]. Further work on the confirmation bias uses party bias to link

messages to presidential candidates (e.g., Freedman & Sears, 1963; Graf & Aday, 2008; Meffert,

Chung, Joiner, Waks, & Garst, 2006; Taber & Lodge, 2006), coding them into consonant versus

dissonant messages based on participants' reported partisanship. In the news bias approach,

studies on the confirmation bias frequently display news source indications to operationalize the

bias in selective exposure. For example, Iyengar and Hahn (2009) presented news items from a

news feed as coming from either Fox News, NPR, CNN, or BBC and had participants select

which of four news items on a screen they would like to read. In addition, numerous surveys

draw on news sources linked to political stances to operationalize consonant versus dissonant

exposure (see Garrett et al., 2013, 2014; Gil de Zúñiga, Correa, & Valenzuela, 2012; Gvirsman,

2014; Stroud, 2008). Finally, in the content bias approach, studies directly examine the

traditional understanding of a confirmation bias—that individuals are more likely to select and

consume message content that aligns with their preexisting views. These studies use messages

that were established via stimuli pretests to convey a certain political topic stance through

content cues, and selective exposure to these messages are categorized as attitude-consistent or -

discrepant based on participants' previously reported attitudes (e.g., Jang, 2014a/b).

This review of confirmation bias research reveals that the majority of this work relies on

source cues to signal whether communication content should be anticipated to align or diverge

from preexisting views. Specifically, the research summarized above under self-reported bias,

ideological bias, party bias, and news bias all emphasize source characteristics and cues. Such

treatment of sources as being either attitude-consistent or attitude-discrepant may be in line with

Festinger's (1957) writing on people's tendency to favor information that bolsters preexisting

views, as he wrote (p. 30): "A person would expose himself to sources of information which he

expected would add new elements which would increase consonance but would certainly avoid

sources which would increase dissonance." Yet, only research on message content bias examines

whether individuals favor information that aligns with preexisting attitudes over attitude-

challenging information, which is how Festinger's theory is generally interpreted.

Influence of Source and Content Cues on Attitudinal Impacts of Selective Exposure

From the perspective of persuasion research, and to understand how a confirmation bias

may lead to greater political polarization, disentangling source impacts from content impacts is

pivotal. For example, when media users choose to attend to a message from a source they

generally disagree with, they likely process the information much more critically from the outset

(cf. Taber & Lodge, 2006), compared to encountering the same message from a source

associated with objective, high-quality information. Hence, source cues could literally revert the

impacts of a given message. Hence, we believe that disentangling source effects from message

effects could elucidate inconsistencies in the existing empirical evidence on the confirmation

bias that have plagued this line of research for decades (review by Donsbach, 2009) up until

recently. So far, few confirmation bias studies consider source cues and content cues

simultaneously. Two studies presented messages with opposing political stances that came from

either low-credibility or high-credibility sources (Knobloch-Westerwick, Mothes, Johnson,

Westerwick, & Donsbach, 2015; Westerwick, Kleinman, & Knobloch-Westerwick, 2013);

hence, source cues did not instigate anticipation of confirming or challenging preexisting views.

An important study by Metzger et al. (in press) examined responses to news stories that varied in

attitude-consistency of content and sources. Yet, participants saw just *one* news item and could

not actually *select* from several articles--a question on likelihood of using the news source in the

future served to tap selective exposure but cannot speak to content confirmation bias. Thus, to

our knowledge, source versus content confirmation biases still have yet to be tested as

independent influences on selective exposure and its attitudinal impacts.

　　　　Possibly even more relevant, some studies find that selective exposure to attitude-

consistent versus -discrepant content has different post-exposure implications for attitudes and

partisanship (Garrett, 2009; Taber & Lodge, 2006). The evidence, however, is inconsistent.

Some research yields that if individuals choose to attend to attitude-discrepant messages, they

will not be influenced by them (e.g., Taber & Lodge, 2006), while other studies (Knobloch-

Westerwick, 2012; Knobloch-Westerwick et al., 2015; Westerwick et al., 2013) find that

attitude-discrepant exposure produces attitude change. Possibly, studies that draw on source cues

(e.g., Taber & Lodge, 2006) to signal what would be attitude-consistent versus -discrepant

exposure allow participants to shield themselves from the outset against any persuasive influence

because even individuals choose to attend to a message associated with a source with an attitude-

challenging stance, they would process the message peripherally or with counter-arguments as

the most salient starting point. In other words, if a message is selected solely based source's

stance cue, as in Taber and Lodge's (2006) study, that cue might function as forewarning of

persuasive intent that could then immediately induce resistance and counter-arguing (Petty &

Cacioppo, 1977). In contrast, studies that ask participants to choose information based on actual

content cues are more likely to have participants actually cognitively engage with attitude-

discrepant content, as no source cues lead to immediate dismissal.

Current Research

The present study disentangles these processes by presenting messages with opposing

stances coming from either slanted or unbiased, high-credibility sources, on four different

political topics. The empirical investigation will present sets of four messages for each topic that

feature opposing stances on the given topic, such that (1) one pro-message is associated with an

unbiased, high-credibility source and (2) one pro-message is associated with a slanted source;

likewise (3) one contra-message is associated with an unbiased, high-credibility source and (4)

one contra-message is associated with a slanted source. With this setup, a message will never be

presented with a source stance that is incompatible with the content stance. Thus, using the topic

of abortion as an example, a pro-life message might be presented as coming from "prolife.org"

as a slanted source or from "clevelandclinic.org" as an unbiased, high-credibility source; but a

pro-life message would not be displayed as coming from "prochoiceaction.org" because this

source's stance would be incompatible with the content stance, and the combination would not

have ecological validity. Analyses will differentiate between both selection rates and exposure

times for the four different combinations of slanted/unbiased source and attitude-consistent/

attitude-discrepant content across the four political topics. Both the discrete selection of message

types and the time spent exposed to them are valid measures of selective exposure (Clay, Barber,

& Shook, 2013). They are strongly correlated and show extremely similar patterns when used to measure selective exposure (e.g., Jang 2014a; Knobloch, Hastall, Zillmann, & Callison, 2003; Winter & Krämer, 2012). We use both measures here. We hypothesize that users of political online information select and spend more time with attitude-consistent information, drawing on work by Festinger (1957) and the many related investigations outlined above.

H1:   Selective exposure to political messages with attitude-consistent content is (a) more frequent in terms of selections and (b) longer in terms of time spent than to political messages with attitude-discrepant content (content confirmation bias).

However, selective exposure should also depend on sources associated with messages. The notion of source credibility as a cue for information quality implies that messages from high-credibility sources should be selected more frequently. Indeed, prior work yielded that online users favored messages from high-credibility sources, regardless of message stance (Knobloch-Westerwick et al., 2015; Westerwick et al., 2013), which suggests they may also spend more time on messages from unbiased, high-credibility sources over slanted sources. Along these lines, sources perceived as more balanced and objective are also considered more credible and authoritative (Flanagin & Metzger, 2007). Despite partisan differences in bias perceptions (the hostile media effect), both liberals and conservatives still tend to see unbiased sources as most credible, interesting, and informative (Coe et al., 2008). This accounts for the continued relative dominance of mainstream news sources despite the proliferation of niche and partisan news outlets (Webster & Ksiazek, 2012). It is thus expected that media users favor unbiased, high-credibility over slanted sources.

H2:   Selective exposure to political messages from unbiased, high-credibility sources is (a) more frequent in terms of selections and (b) longer in terms of time spent than to political

messages from slanted sources.

Further, there is a possibility of an interaction between content and source. Building off the confirmation bias and the related work examining it using source cues, we might anticipate that messages with attitude-consistent content are even more frequently selected when coming from slanted sources with the same attitude-consistent stance, compared to messages with attitude-consistent content cues from an unbiased, high-credibility source. Lowin (1967) already suggests that because low-credibility sources are easily discredited, they might facilitate selective exposure to attitude-discrepant messages. Yet, empirical evidence does not support this moderating role of source on the confirmation bias (Knobloch-Westerwick et al., 2015). Based on this prior evidence, we expect content cues and source cues to affect the confirmation bias through distinct evaluative processes, without interacting. Although unbiased, high-credibility sources should have more overall appeal, they should not strengthen selectivity to attitude-consistent messages or away from attitude-discrepant messages. But, given Lowin's (1967) suggestion and the intuitive appeal that same-stance slanted sources might further confirmation bias, we will still examine this possibility with a research question [as above for hypotheses, the RQ is differentiated for (a) selective exposure per message selections and (b) reading time].

RQ1a/b: Is the confirmation bias suggested in H1a/b more or less pronounced for messages

associated with slanted sources, compared to unbiased sources?

Next, because the ELM postulates that central processing requires motivation and ability for such effortful consideration, the present investigation will consider information processing styles along the lines of *need for cognition* (NFC, pertaining to motivation; Cacioppo & Petty, 1982) and *cognitive reflection* (CR, pertaining to ability; Frederick, 2005). Given that Taber and Lodge (2006, p. 757) argue that "Being a motivated reasoner takes effort," we assume that

considering message stance (H3) and source quality (H5) when selecting content will also be

more pronounced the more individuals enjoy and tend to engage in complex thought and thus

have generally greater *motivation* to process information. NFC also plays a prominent role in

much research on the ELM (Cacioppo & Petty, 1982) and will likely result in greater message

discrimination per confirmation bias. In other words, the higher an individual's NFC, the more

the individual should utilize cues on message and source slant as a forewarning of persuasive

intent (Petty & Cacioppo, 1977) when engaging in selective exposure, resulting in greater

confirmation bias (see H3 below) and more frequent and longer exposure to messages from

unbiased, high-credibility sources (see H5 below). Despite indication that high NFC is associated

with more time spent reading balanced versus one-sided messages (Winter & Krämer, 2012) and

more trust in mainstream news sources (Tsfati & Cappella, 2005), these same individuals should

also ultimately seek consistency in their elaborative thought. If higher NFC leads individuals to

process information more intensely, they should per Festinger (1957) experience greater

discomfort if the information challenges their views, which should again foster a stronger

confirmation bias the higher the NFC (see H3 below).

Cognitive reflection, on the other hand, does not pertain to how much individuals *like*

complex thinking but instead serves as a measure of *ability* (Frederick, 2005). Using this

measure in a study on confirmation bias and political polarization is an extension of this line of

research because CR was thus far primarily used in general decision-making research (see

Campitelli & Gerrans, 2014, for a discussion of the measure). It captures individuals' tendency

to carefully reconsider an intuitive reaction and to engage in more reflection for a correct

conclusion—thus the higher an individual's CR the more the individual should engage in more

balanced information consumption and show a weaker content confirmation bias (per H4). For

example, research on political information processing shows that those with more expert knowledge are more balanced in their attentiveness to consistent and discrepant information and less reliant on heuristics that frame the information (Fiske, Kinder, & Larter, 1983). CR will likely affect the processing of actual content and not shape attention to sources; thus we do not postulate a hypothesis on CR impact on source bias (as above, the hypotheses are differentiated for (a) selective exposure per message selections and (b) reading time).

{H3a/b}[H4a/b]:The content confirmation bias suggested in H1a/b is more pronounced the greater the individual's {need for cognition} [cognitive reflection].

H5a/b: The selective exposure to messages from unbiased, high-credibility sources suggested in H2a/b is more pronounced the greater the individual's need for cognition.

The next hypotheses suggest selective exposure effects on attitudes, drawing on concerns that the confirmation bias will foster polarization (Stroud, 2010). Polarization is a broader concept that encompasses processes such as attitude reinforcement, attitude maintenance, and increase in attitude certainty. Attitude reinforcement can lead to attitude shifts toward greater extremity (e.g., Levendusky, 2013), while some scholars consider merely sustaining preexisting attitudes or becoming more certain regarding one's own attitude relevant (Krosnick, Boninger, Chuang, Berent, & Carnot, 1993). Along the same lines, weakening of attitudes refers to attitude shifts toward weaker attitudes. The above-discussed persuasion perspective, the ELM in particular, suggests that both message content and source credibility cues affect such persuasion effects of selective exposure. We expect that all selective exposure shifts attitudes in line with encountered content—except attitude-discrepant content from slanted sources, which should be easily refuted (as discussed above). The ELM further suggests that persuasion effects vary in persistence. Yet, previous selective exposure experiments focused on short-term rather than

medium- or long-term reinforcement effects. The present research extends earlier findings by

following Levendusky (2013), who measured attitude change (albeit in response to forced

exposure) both immediately and two days later. Thus, H6/7 examine immediate and persistent

impacts, respectively. As they pertain to persuasive impacts, we focus on selective exposure in

terms of reading time, because longer message exposure makes such effects more likely.

{H6}[H7]: Selective exposure to (a) attitude-consistent content from unbiased, high-credibility

    sources and (b) from slanted, attitude-consistent sources has {immediate} [persistent]

    reinforcing impacts on preexisting attitudes, while selective exposure to (c) attitude-discrepant

    content from unbiased, high-credibility sources has {immediate} [persistent] weakening

    impacts on preexisting attitudes.

Finally, the following nondirectional hypotheses examine whether the attitude shifts depend on

information processing styles. Overall, the above outlined research on the ELM suggests that

individuals with low motivation (conceptualized through NFC) and low ability (conceptualized

through CR) will be more affected by source cues. Again, because these hypotheses pertain to

persuasive impacts, we focus on selective exposure time.

        H8: The impacts suggested in H6a/b/c depend on need for cognition.

        H9: The impacts suggested in H6a/b/c depend on cognitive reflection.

        H10: The impacts suggested in H7a/b/c depend on need for cognition.

        H11: The impacts suggested in H7a/b/c depend on cognitive reflection.

Method

Overview

    A within-subjects experiment ($N = 120$) with a lab session plus an online follow-up was

conducted. First (t1), participants indicated their political attitudes on four target and eight

distracter topics, as well as partisanship, habitual media use, and information processing traits.

Then, participants browsed online search results on the four target topics (health care, minimum

wage, gun control, and abortion), with four search results displayed for each topic (see Appendix

A, https://osf.io/t732m, for an example). The presented search results featured opposing stances

on the topics, two pro messages for which the leads featured cues that the content supported a

policy (e.g., stricter gun control) and two contra messages for which the leads featured cues that

the content opposed the policy. Further, one pro message would be associated with an unbiased,

high-credibility source and one with a slanted source; likewise a contra message would be

associated with an unbiased, high-credibility source and one with a slanted source. For each

topic, participants had 2 minutes to freely browse the content, while selective exposure was

logged by software. After the browsing, attitudes and partisanship were captured again (t2). Two

days after the lab session, participants completed an online follow-up (t3) with the same attitude

and partisanship questions, along with a sources (unbiased vs. slanted) manipulation check.

Participants

A total of 135 undergraduate students were recruited through communication courses at a

large Midwestern university and given course credit for their involvement. Six individuals did

not complete the lab session, two experienced technical errors, and seven did not engage with the

browsing task, as indicated by not reading any articles or by spending more than half the

browsing time for a topic on the overview page. Screening these 15 cases out left 120 individuals

who participated in the lab session. A full 94 of these participants (78.33%) also completed a

separate follow-up session online. The sample was 67.5% female; $M_{age} = 21.39$, $SD = 2.09$,

range 18-32; 76.7% Non-Hispanic White/Caucasian, 10.8% Asian, 4.2% Black/African-

American, 2.5% Hispanic/Latino, 0.8% Pacific Islander, 1.7% multiracial, and 3.3% other.

Procedure

A website programmed with MS Silverlight displayed stimuli, captured selective exposure in seconds, and present questionnaires. The study consisted of two sessions. The first was a 35- to 40-minute lab session that included pre-exposure measures (t1), a section in which participants browsed search results, and a post-exposure set of measures (t2). The second session was a 10-minute online questionnaire (t3) emailed to participants 48 hours after the lab session.

Session 1, t1. Participants attended Session 1 in a lab setting, as a study about "reading online news." They were seated at private PCs and accessed the website. The pre-exposure measures (t1) included dichotomous attitude measures, Likert-type attitudes, partisanship, general media use, demographics, the cognitive reflection test, and a need for cognition measure.

Session 1, browsing. The lab session continued to the selective exposure task by informing participants they would "see pages with search results that a news portal turned up for different societal issues" and to "please read what you find interesting, just as you normally would." After instructions, each set of search results was presented for 120 s and participants were free to browse whichever articles they liked.

Session 1, t2. After all four search results sets had been displayed, the session repeated the attitude measures, then assessed political participation. Participants were then thanked for their time and reminded that they would be contacted for a short follow-up in two days.

Session 2, t3. After 48 hours, participants received a hyperlink to the study site. After logging in to the site, participants again completed the attitudes questions and rated the sources used in the search results regarding credibility and slant, as a manipulation check.

Stimuli

The stimuli (adapted from Westerwick et al., 2013) were presented through a news search

portal, as ostensible results from keyword searches. In this way, a set of four articles was presented for each political issue. Within each topic, the results were manipulated in a 2x2 design (source x stance), so that half of the articles (one advocating supporting the issue, one opposing it) featured a slanted source and the other half (one article supporting, one opposing) featured an unbiased, high-credibility source. Each article consisted of a headline and lead (about 30 words) that previewed the article on the overview page, and a full-length article body (word length $M = 732.31$, $SD = 4.54$). Headlines and leads had been validated as conveying desired stances while presenting equivalent credibility and interest levels (Westerwick et al., 2013).

The sources were selected such that the URLs and source labels indicated a certain stance or appeared unbiased (see sources manipulation check), and were presented alongside respective headlines. Slanted sources were matched to the ideological stance of their article, so that a source opposing universal health care would appear with an article that also opposed universal health care, for example. Unbiased sources were systematically rotated across articles with both stances. A Latin square design was used to vary article order on overview pages to avoid confounds with order effects[3]. Search results were presented in this order: health care, minimum wage, gun control, and abortion.

Measures

Attitudes (Likert scales). For each of the target issues ("Universal health care," "Increase minimum wage," "Stricter gun control," and "Legalize abortion"), participants indicated their opposition or support with Likert-type scales anchored by 1 = *Strongly oppose* and 7 = *Strongly support.* Eight distracter topics (e.g., "Campaign finance restrictions" and "Same-sex marriage") were used to mask the focus of the study on the four target topics. Topics were presented in a randomized order. Descriptives for Likert-type attitudes at all time points

(pre-exposure, post-exposure, and follow-up) appear in Appendix B, https://osf.io/t732m.

Attitude extremity. A measure of attitude extremity was derived from the Likert-type attitude measures from t1 for the four target topics. For each topic, the attitude ratings were recoded (1 & 7 = 4, 2 & 6 = 3, 3 & 5 = 2, 4 = 1). The resulting extremity scores for the four topics (Appendix B) were averaged to form an index of attitude extremity, $M = 3.23$, $SD = 0.67$.

Attitude (dichotomous). Participants were instructed to categorize issues with *Oppose* or *Support*, using their keyboard's "z" and "/" keys while maximizing both accuracy and speed. First, participants were familiarized with this procedure via practice trials, categorizing sets of words such as "Marvelous" and "Painful" as *Negative* or *Positive* or words such as "Tulip" and "Bee" as *Insect* or *Flower*, using the same "z" and "/" keys. Then, the distracter issues and four target issues were each presented on the screen and categorized by participants. This task produced dichotomous measures of issue attitudes (reported in Appendix B as percentage of support). These were highly correlated with Likert-type attitudes at t1 (pre-exposure), $r_{\text{health care}} = .82$, $p < .001$, $r_{\text{minimum wage}} = .82$, $p < .001$, $r_{\text{gun control}} = .75$, $p < .001$, $r_{\text{abortion}} = .74$, $p < .001$, so that these dichotomous pre-exposure attitudes were used to categorize subsequent message exposure (see below) as either attitude-consistent or attitude-discrepant. Likert-type and dichotomous attitudes were also strongly correlated at t2 (rs > .62, ps < .001) and t3 (rs > .61, ps < .001).

Attitude reinforcement. A variable was computed to represent *immediate attitude reinforcement* across topics: For each topic-specific attitude, the t1 attitude Likert rating was subtracted from the t2 attitude Likert rating; if a participant had selected "oppose" in the related dichotomous attitude measurement, the difference was multiplied with -1. Essentially the same computation served to capture *persistent attitude reinforcement,* using the t1 and t3 measures.

Selective exposure. The website logged all browsing to capture selective exposure in

seconds during the presentation of each set of search results. In a recent review of the state of the

art, this approach is highlighted for its validity in measuring selective exposure (Clay et al.,

2013). This technique for measuring selective exposure has been widely used and was validated

for both print and online message exposure (e.g., Knobloch et al., 2003; Zillmann, Knobloch, &

Yu, 2001). The selection rate and time spent viewing are both well validated-measures, are

strongly correlated, and produce similar results (e.g., Jang, 2014a, Winter & Krämer, 2012). For

each issue, this produced measures of article selection and time spent reading each of the articles

that were presented in the 2x2 design (slanted/unbiased x opposition/support) for each topic. The

dichotomous attitudes at t1 were used to categorize exposure to these articles as (1) attitude-

consistent content from attitude-consistent slanted-source, (2) attitude-consistent content from

unbiased-source, (3) attitude-discrepant content from attitude-discrepant slanted-source, or (4)

attitude-discrepant content from unbiased-source. Because browsing time was limited to 2

minutes for each set of search results, time spent on one selective exposure category naturally

reduced exposure to other categories. Participants read a mean average of 6.70 ($SD = 2.94$) of the

16 articles. If an article was selected, it was read for a duration of $M = 75.39$ s ($SD = 28.67$).

Cognitive reflection (CR). The cognitive reflection test (Frederick, 2005) used three

word problems to measure individual differences in the extent of reflective versus intuitive

thinking. For example, participants were presented with the following: "A bat and a ball cost

$1.10 in total. The bat costs $1.00 more than the ball. How many cents does the ball cost?"

Correct answers (e.g., 5 cents for the example item) were coded as 1, incorrect answers coded as

0. The items were summed to form a scale ranging from 0 to 3, $\alpha = .63$, $M = 0.70$, $SD = 0.96$.

Need for cognition (NFC). A 5-item subscale of the short-form rational-experiential

inventory (REI-10; Pacini & Epstein, 1999) measured need for cognition. The items (e.g., "I

would prefer complex to simple problems" 1 = *completely false* to 5 = *completely true*) were

summed to form a reliable scale ranging from 5 to 25, $\alpha = .78$, $M = 16.53$, $SD = 4.13$.

       Source perceptions. For each of the 16 sources used in the study, participants rated the

source on its credibility (1 = *Not at all credible* to 7 = *Extremely credible*) and its issue support

(1 = *Strongly opposes [ISSUE]* to 7 = *Strongly supports [ISSUE],* e.g., "universal health care").

Scores appear in Appendix D, https://osf.io/t732m and were tested for their desired effects.

Sources Manipulation Check

       Within-subjects ANOVAS for each political issue examined the source perceptions of

slant and credibility. The expected significant differences existed among sources for each issue,

on both slant, Fs(3, 279) > 8.76, ps < .001, $\eta_p^2 > .08$, and credibility, Fs(3, 279) > 2.97, ps < .04,

$\eta_p^2 > .03$. Further details are reported in Appendices C and D, https://osf.io/t732m.

<div align="center">

Results

</div>

Selection of Attitude-Consistent vs. -Discrepant Messages, Slanted vs. Unbiased Sources

       The first analysis utilized the frequency with which attitude-consistent and -discrepant

messages were selected, as differentiated by topic, attitude-consistency, and association with

slanted versus unbiased source. This analysis of variance yielded a clear confirmation bias, F(1,

119) = 26.06, $p < .001$, $\eta_p^2 = .180$, as participants selected attitude-consistent messages more, M

= 3.88 ($SD = 1.86$) compared to $M = 2.82$ attitude-discrepant messages ($SD = 1.87$). Thus, H1a

was supported. Beyond this effect of the within-subjects factor of attitude consistency, no

impacts with relevance for hypotheses emerged from this model[4]. H2a was not supported by the

findings of this analysis ($p = .209$); the interaction considered in RQ1a did not emerge ($p = .869$).

       Further, the ANOVA model was extended to incorporate CR and NFC as continuous

covariates per hypotheses H3a, H4a, and H5a. This analysis again revealed a confirmation bias

$F(1, 117) = 11.68$, $p = .001$, $\eta_p^2 = .091$, and yielded an interaction between attitude consistency

and CR, $F(1, 117) = 5.53$, $p = .020$, $\eta_p^2 = .045$ (see Figure 1). Individuals with the lowest CR

score exhibited a confirmation bias, whereas individuals with higher CR scores did not

significantly favor attitude-consistent content over attitude-discrepant content. This significant

interaction supports H4a. Further, this analysis showed that source cues affected selective

exposure, $F(1, 117) = 10.99$, $p = .001$, $\eta_p^2 = .086$, because participants selected unbiased source

messages more often than slanted source messages, $M_{unbiased} = 3.49$, $SD = 1.87$, compared to

$M_{slanted} = 3.21$, $SD = 1.96$, as suggested in H2a. The fact that the inclusion of CR and NFC in the

model now produces a significant finding for H2a indicates that these information processing

variables are influential, as suggested in H5a, and serve as important control variables. Indeed,

NFC affected selective exposure to messages from slanted versus unbiased sources, $F(1, 117) =$

10.06, $p = .002$, $\eta_p^2 = .079$, such that correlations showed that individuals high in NFC selected

fewer messages from slanted sources, $r = -.23$, $p = .013$. These findings corroborate H5a. An

effect from NFC on the confirmation bias per H3a fell short of significance ($p = .105$).

Exposure to Attitude-Consistent vs. -Discrepant Content and Slanted vs. Unbiased Sources

An ANOVA was conducted with the selective exposure times as repeated measures, as

differentiated by topic, association with slanted versus unbiased source, and attitude-consistent

versus attitude-discrepant content. Thus, exposure times for each of the sixteen stimulus articles

were included in the model. Again, it should be noted that the stance of slanted sources was

always aligned with the content stance to maintain ecological validity.

This ANOVA yielded a strong confirmation bias, $F(1, 119) = 22.85$, $p < .001$, $\eta_p^2 = .161$,

as participants spent $M = 261$ s ($SD = 105$) on messages with attitude-consistent content cues

compared to $M = 168$ s ($SD = 110$) on messages with attitude-discrepant content cues. Hence,

H1b was supported. Beyond this effect of the within-subjects factor of attitude consistency, no impacts with relevance for hypotheses emerged from this model[5]. H2b was not supported by the findings of this analysis, and the interaction considered in RQ1b did not materialize.

Next, the ANOVA model was extended to consider influences of CR and NFC as continuous covariates per hypotheses H3b, H4b, and H5b. This analysis did not yield an overall confirmation bias ($p = .167$), but an interaction emerged between attitude consistency and CR, $F(1, 116) = 4.56$, $p = .035$, $\eta_p^2 = .038$, as illustrated in Figure 1. Individuals with the lowest score in the cognitive reflection test exhibited a confirmation bias, whereas individuals with higher CR scores did not significantly favor attitude-consistent content over attitude-discrepant content. Thus, this significant interaction supports H4b. Further, sources affected selective exposure, $F(1, 116) = 3.88$, $p = .052$, $\eta_p^2 = .032$, because participants in general spent more time with unbiased source messages than slanted source messages, $M_{unbiased} = 226$ s, $SD = 116$, compared to $M_{slanted} = 203$ s, $SD = 113$. Yet, while in line with H2b prediction, the support is weak because it is just at the cut-off for significance, and it also requires inclusion of the CR and NFC information processing variables to control for variance that otherwise dissipates the effect suggested in H2b. Additionally, NFC affected selective exposure to messages from slanted versus unbiased sources, $F(1, 116) = 8.77$, $p = .004$, $\eta_p^2 = .07$, such that correlations showed that the higher NFC, the less time was spent with messages from slanted sources, $r = -.28$, $p = .002$, and more time with messages from unbiased sources, $r = .24$, $p = .009$. These findings corroborate H5b. An effect from NFC on the confirmation bias also emerged, $F(1, 116) = 4.13$, $p = .044$, $\eta_p^2 = .034$, supporting H3b, as the higher NFC, the more time was spent viewing attitude-consistent content, $r = .13$, $p = .143$ and less time viewing attitude-discrepant content, $r = -.17$, $p = .067$.

Immediate Impacts of Attitude-Consistent Selective Exposure on Attitude Reinforcement

A regression analysis examined the impacts of slanted-source attitude-consistent content exposure and unbiased-source attitude-consistent content exposure on immediate attitude reinforcement. Time spent on overview pages and attitude extremity at t1 were controlled for because participants differed in how much time they actually spent with article pages, which influences the general exposure level, and in how much further their attitudes could actually change depending on preexisting attitude level. To avoid multicollinearity, no exposure measures for attitude-discrepant content were included in the model. The overall model was significant, p = .024, with R^2 = .092. In line with H6b, a significant impact of slanted-source attitude-consistent content exposure emerged, $beta$ = .25, p = .013. However, the impact of unbiased-source attitude-consistent content exposure, which was suggested in H6a, fell short of marginal significance ($beta$ = .17, p = .108) in this analysis.

Immediate Impacts of Attitude-Discrepant Selective Exposure on Attitude Reinforcement

The next regression analysis investigated impacts of slanted-source and unbiased-source attitude-discrepant content exposure on immediate attitude reinforcement while controlling for time spent on overview pages and attitude extremity at t1. To avoid multicollinearity, no exposure measures for attitude-consistent content were incorporated in the model, which was significant, p = .038, with R^2 = .084. In line with H6c, it yielded a significant impact of unbiased-source attitude-discrepant content exposure, $beta$ = -.20, p = .039. As expected, slanted-source attitude-discrepant content exposure impacts did not approach significance.

Moderated Immediate Impacts of Selective Exposure on Attitude Reinforcement

Next, interactions between selective exposure and NFC in the impact on immediate attitude reinforcement was examined, per H8, by using the MODPROBE macro (Hayes & Matthes, 2009), again controlling for time spent on overview pages and attitude extremity.

Because this macro uses unstandardized coefficients, selective exposure times were entered with minutes as units (to avoid very small coefficients resulting from using seconds as units). The interaction between unbiased-source attitude-consistent content exposure and NFC was significant, $p = .033$, $\Delta R^2 = .036$, $b = .085$, $SE = .039$, $t = 2.16$. Based on the Johnson-Neyman technique, the macro identified regions in the range of the moderator variable where the effect of the focal predictor on the outcome statistically was significant. The analysis showed that individuals with greater NFC (with scores of 18 or higher) were particularly reinforced in their attitudes from unbiased-source attitude-consistent content exposure. This finding answers H8a with regard to immediate impacts. Moreover, this analysis yielded significant main impacts of both unbiased-source attitude-consistent content exposure, $b = .56$, $SE = .22$, $t = 2.62$, $p = .010$, and slanted-source attitude-consistent content exposure, $b = 1.42$, $SE = .55$, $t = 2.56$, $p = .012$, and thus support for both H6a and H6b. Further, the interaction between slanted-source attitude-consistent content exposure and NFC was significant, $p = .016$, $\Delta R^2 = .046$, $b = -.120$, $SE = .049$, $t = -2.45$. The Johnson-Neyman technique detected that individuals with lower NFC (with scores of 17 or lower) were particularly reinforced in their attitudes from slanted-source attitude-consistent content exposure, which addresses H8b. But H8c was not supported, as impacts from unbiased-source attitude-discrepant content exposure did not interact with NFC (*n.s.*).

Further, an interaction between selective exposure and CR in the impact on immediate attitude reinforcement was examined, per H9a/b/c, again with the MODPROBE macro (Hayes & Matthes, 2009), again controlling for time spent on overview pages and attitude extremity and by using selective exposure measures with minute as unit. The analyses yielded a significant interaction between unbiased-source attitude-discrepant content exposure and CR, $p = .038$, $\Delta R^2 = .033$, $b = .443$, $SE = .211$, $t = 2.11$. Based on the Johnson-Neyman technique, the analysis

showed that individuals with lower CR (in the score range of 0.75 or lower) were particularly

weakened in their attitudes from exposure to attitude-discrepant content from unbiased sources.

This finding answers H9c for immediate impacts. The Johnson-Neyman technique detected that

individuals with lower CR (0.60 and lower) were more strongly influenced by unbiased-source

attitude-consistent content exposure, but this interaction fell short of significance overall, $p =$

.091, $\Delta R^2 = .023$, $b = -.307$, $SE = .180$, $t = -1.70$; hence, only weak evidence for H9a emerged. A

moderation, per H9b, that immediate impact from exposure to attitude-consistent content from

slanted sources depends on CR, was not evident (*n.s.*).

Persistent Impacts of Attitude-Consistent Selective Exposure on Attitude Reinforcement

Impacts on persistent attitude reinforcement were examined with a regression analysis

using slanted-source and unbiased-source attitude-consistent content exposure as predictors

while controlling for time spent on overview pages and attitude extremity at t1. To avoid

multicollinearity, no exposure measures for attitude-discrepant content were included in the

model. The overall model fell short of significance, $p = .085$, with $R^2 = .087$. Corroborating H7b,

a significant impact of slanted-source attitude-consistent content exposure emerged, *beta* = .27, *p*

= .021. However, the impact of unbiased-source attitude-consistent content exposure, as

suggested in H7a, fell short of marginal significance (*beta* = .18, *p* = .116). These persistent

effects correspond to the results for H6, of immediate impacts.

Persistent Impacts of Attitude-Discrepant Selective Exposure on Attitude Reinforcement

Moving on to examine impacts from slanted-source and unbiased-source attitude-

discrepant content exposure on persistent attitude reinforcement, another regression analysis was

conducted, which also controlled for time spent on overview pages and attitude extremity at t1.

To avoid multicollinearity, no exposure measures for attitude-consistent content were

incorporated in the model. The overall model was marginally significant, $p = .052$, with $R^2 =$ .099. H7c was not supported, as the impact from unbiased-source attitude-discrepant content exposure was immaterial for persistent attitude reinforcement (*n.s.*). However, slanted-source attitude-discrepant content exposure negatively affected persistent attitude reinforcement, *beta* = -.27, $p = .010$. This effect had not been hypothesized, as it would seem more likely that individuals would shield their attitudes from undermining impacts of attitude-discrepant content, in particular, from sources likely to challenge preexisting attitudes (along the lines of a disconfirmation bias per Taber & Lodge, 2006).

Moderated Persistent Impacts of Selective Exposure on Attitude Reinforcement

Analyses with MODPROBE (Hayes & Matthes, 2009) examined interactions between selective exposure impacts and processing styles, NFC and CR. No significant interactions with NFC were evident for persistent attitude reinforcement. Thus, persistent effects from H10a/b/c were not found. Looking at exposure to attitude-consistent content from either unbiased or slanted sources as predictors and CR as moderator while controlling for time spent on overview pages and attitude extremity, no significant interaction emerged, much as seen with the immediate impacts. Likewise, the analyses with attitude-discrepant content exposure variables and CR yielded a significant interaction in line with H11c between unbiased-source attitude-discrepant content exposure, $p = .015$, $\Delta R^2 = .058$, $b = .649$, $SE = .261$, $t = 2.48$, because individuals with low CR (0.15 or lower) were more weakened in their attitudes while individuals with high CR even trended toward reinforcement. Moreover, the main effect suggested in H7c was significant, because unbiased-source attitude-discrepant content exposure had a persistent weakening impact on attitudes, $b = -.750$, $SE = .327$, $t = -2.295$, $p = .024$, while an unexpected impact of slanted-source attitude-discrepant content exposure mentioned above was again

significant, $b = -.850$, $SE = .282$, $t = -3.019$, $p = .003$. No support for H11a/b emerged.

Discussion

In light of ample concerns about increasing political polarization resulting from accessing primarily attitude-consistent information, the current study examined the role of message content versus source cues on short-term and delayed attitude impacts. It utilized source cues to study whether recipients spend more time with messages from slanted sources, which they perceive to align with their own attitudes, or messages from unbiased sources. At the same time, the messages themselves carried clear stances, either supporting or challenging preexisting attitudes. This setup was applied to four controversial political issues, presented in an online search context. From a persuasion perspective, message content and source cues relate to different modes of information processing, central or peripheral, which implies that individuals with different information processing styles may respond differently to these cues and may be affected differently by the selective exposure to the presented political messages.

First, we examined impacts on selective exposure. Results yielded support for the confirmation bias suggested in H1a/b, because participants favored attitude-consistent content over attitude-challenging content. Regarding RQ1, this confirmation bias was not moderated by source cues and existed for both unbiased and slanted sources, which we had expected per earlier parallel evidence (Knobloch-Westerwick et al., 2015). Hence, Lowin's (1967) approach avoidance model was once more not supported. Interestingly, the confirmation bias depended both on information users' need for cognition and cognitive reflection, corresponding with H3b and H4a/b, because the confirmation bias was slightly stronger (in time spent reading but not number of articles selected) among higher-NFC individuals (weak support for H3b), whereas only low cognitive reflection individuals exhibited a significant bias toward attitude-consistent

content (H4a/b supported). The findings regarding H2a/b—that selective exposure is greater for

messages from unbiased sources—did not yield a clear picture. Simple ANOVAs found no

support; yet when considering information processing styles per H3-5, the results indicate that

messages from unbiased sources were indeed slightly more frequently selected ($p < .001$) and

viewed longer (though this difference was just at the cut-off for significance; $p = .052$). The

interaction between source slant and NFC postulated in H5 was supported because individuals

who enjoy thinking in general spent very little time with messages from slanted sources. The

support for H5 suggests that high-NFC individuals, who enjoy and tend to engage in complex

thought, pay more attention to the actual content but also use source cues in avoiding slanted

material. As a result, they appear to be more effective in excluding discrepant information than

low-NFC individuals—such information could also be considerably more distressing for high-

NFC individuals due to their tendency to engage in deep processing. In short, all postulations in

H1, H4, and H5 regarding selective exposure impacts were supported, while H2 found no

straightforward support with the source cues' impact depending on information processing style;

further, weak support emerged for a small effect in line with H3b, as H3 was significant for

reading time (H3b) but fell short of significance for article selection (H3a).

     Looking at immediate impacts of selective exposure, H6b and H6c were supported. The

more time individuals spent with attitude-consistent content associated with slanted sources, the

more immediate attitude reinforcement occurred (supporting H6b); the more time was spent with

attitude-discrepant content from an unbiased source, the more were attitudes weakened

(supporting H6c). Considering persistent impacts of selective exposure, H7b was corroborated,

because exposure to attitude-consistent content from slanted sources yielded an impact, even

days later. Further, persistent exposure impacts from attitude-discrepant content from unbiased

sources (H7c) were partially supported, as the effect was initially non-significant but emerged

when considering an interaction with cognitive reflection. But, both immediate impacts (per

H6a) and persistent impacts (per H7a) from exposure to attitude-consistent content from

unbiased sources fell short of significance; a significant finding in line with H6a only emerged

when considering the interaction with NFC per H8. Interestingly, an unexpected delayed impact

from attitude-discrepant content from a slanted source occurred, weakening preexisting attitudes

when measured days later—possibly, a sleeper effect allowed such information to sink in or be

re-activated in memory while people forgot that the associated source was slanted.

Examination of how information processing styles affected immediate impacts on

attitudes supported H8a and H8b but not H8c. Individuals with greater NFC were particularly

reinforced in their attitudes from exposure to attitude-consistent content from unbiased sources,

whereas individuals with lower NFC were particularly reinforced in their attitudes from exposure

to attitude-consistent content from slanted sources. This pattern suggests that what appeared as

high-quality information from unbiased sources was more effective in strengthening attitudes

among high-NFC individuals who process information more thoroughly; on the other hand, the

information processing of reinforcing content associated with a slanted source was more

impactful when received by low-NFC individuals who tend to take cognitive short-cuts. Further,

the pattern aligns with classic findings (Petty, Cacioppo, & Goldman, 1981) showing that need

for cognition affects the consideration of source cues. When examining immediate impacts, the

influence of CR was also evident in line with H9c: Among lower CR individuals, attitudes were

particularly weakened from exposure to attitude-discrepant content from unbiased sources.

Additionally, persistent impacts from attitude-discrepant content from unbiased sources

depended on cognitive reflection because individuals with low CR were more weakened in their

attitudes (per H11c), but NFC did not moderate persistent impacts (no support for H10).

Several important findings emerged in our study. First off, both need for cognition and cognitive reflection moderated the confirmation bias, which adds to the scarce insight on what traits affect this phenomenon (Hart et al., 2009; Smith et al., 2008). This finding suggests that the pattern long suggested (Festinger, 1957) may not always have found support (Donsbach, 2009) because it depends on these traits. Indeed, some of the postulated effects in the present study were only significant when information processing styles were considered. Second, very few studies have tracked selective exposure along with subsequent impacts, as in this study. Importantly, selective exposure did not only affect attitudes in the short run—its impacts could still be detected two days later. Immediate impacts on attitudes depended in part on information processing styles, but not all related moderations emerged as significant (H8a/b and H9c supported; H8c, H9a/b not supported)--persistent impacts evolved largely independently from these cognitive traits (H11c supported; H10a-c, and H11a/b not supported). H6a and H7a on immediate and persistent attitude reinforcement from exposure to attitude-consistent content from unbiased sources fell short of significance, possibly due to a relatively small sample.

Further limitations of this study must be noted. The use of a student sample raises questions as to whether the present patterns will emerge for other populations as well. It is desirable to examine the persistence of effects with greater delay than in our research design (e.g., 1-2 weeks instead of just 2 days; cf. Kumkale & Albarracín, 2004). More work is needed to better understand traits and cues that shape selection and processing of political information. Clearly, source cues along with message content deserve specific research attention because they can foster, eliminate, or even reverse selective exposure impacts on attitudes.

It is plausible in light of the present findings that some inconsistencies in prior empirical

results can be explained with the presence and characteristics of source cues—when attending

selectively to a message from a source associated with an attitude-discrepant stance, recipients

may set up barriers against persuasion and exhibit even reactance such that they hold views that

oppose the message's stance even more strongly than before attending to that message (as in

Taber & Lodge's study, 2006). When no source cues are present for attitude-discrepant content,

recipients may simply not be affected by selective exposure to that message at all and simply

shield against that attitude-undermining influence by disregarding the message. Prior empirical

work (e.g., Knobloch-Westerwick, 2012) did not present any source cues to participants and

found that attitude-consistent selective exposure reinforced attitudes whereas discrepant selective

exposure was inconsequential. The present work shows that selective exposure to attitude-

discrepant content associated with unbiased high-credibility sources weakens preexisting

attitudes. Additionally, an unexpected finding in our study suggests that recipients may initially

shield their attitudes against influence from discrepant content from slanted sources, but may

later have forgotten about the oppositional source and thus eventually be affected by the content.

Overall, the present findings reflect that applying a persuasion perspective to

consequences of the confirmation bias is very fruitful. As it stands, both source cues and

message content affect selective exposure along a confirmation bias and shape subsequent

processing and even persistent effects of the political messages. President Obama has publicly

voiced concern about the negative consequences of a confirmation bias in news exposure for the

democratic discourse. Given the current evidence, he might be relieved to hear that recipients

are sometimes open to attitude-challenging messages and may adjust their attitudes accordingly.

References

Abramowitz, A. I. & Saunders, K. L. (2008). Is polarization a myth? *Journal of Politics, 70*, 542-
    555. doi: 10.1017/S0022381608080493

Bennett, W. L., & Iyengar, S. (2008). A new era of minimal effects? The changing foundations
    of political communication. *Journal of Communication, 58*, 707-731. doi:
    10.1111/j.1460-2466.2008.00410.x

Cacioppo, J. T., & Petty, R. E. (1982). The need for cognition. *Journal of Personality and Social
    Psychology, 42*, 116-131. doi: 10.1037/0022-3514.42.1.116

Campitelli, G., & Gerrans, P. (2014). Does the cognitive reflection test measure cognitive
    reflection? A mathematical modeling approach. *Memory & Cognition, 42*, 434-447. doi:
    10.3758/s13421-013-0367-9

Clay, R., Barber, J. M., & Shook, N. J. (2013). Techniques for measuring selective exposure: A
    critical review. *Communication Methods and Measures, 7*, 147-171. doi:
    10.1080/19312458.2013.813925

Coe, K., Tewksbury, D., Bond, B. J., Drogos, K. L., Porter, R. W., Yahn, A., & Zhang, Y.
    (2008). Hostile news: Partisan use and perceptions of cable news programming. *Journal
    of Communication, 58*, 201-219. doi: 10.1111/j.1460-2466.2008.00381.x

Donsbach, W. (2009). Cognitive dissonance theory – A roller coaster career: How
    communication research adapted the theory of cognitive dissonance. In T. Hartmann
    (Ed.), *Media choice: A theoretical and empirical overview* (pp. 128-148). New York,
    NY: Routledge.

Festinger, L. (1957). *A theory of cognitive dissonance.* Stanford, CA: Stanford University Press.

Fiske, S. T., Kinder, D. R., & Larter, W. M. (1983). The novice and the expert: Knowledge-
    based strategies in political cognition. *Journal of Experimental Social Psychology, 19*,

381-400. doi: 10.1016/0022-1031(83)90029-X

Flanagin, A. J., & Metzger, M. J. (2007). The role of site features, user attributes, and

information verification behaviors on the perceived credibility of web-based information.

New Media & Society, 9, 319-342. doi: 10.1177/1461444807075015

Frederick, S. (2005). Cognitive reflection and decision making. *The Journal of Economic

Perspectives, 19*(4), 25-42. doi: 10.2307/4134953

Freedman, J., & Sears, D. O. (1963). Voters' preference among types of information. *American

Psychologist, 18*, 375. doi: 10.1037/h0049143

Garrett, R. K. (2009). Politically motivated reinforcement seeking: Reframing the selective

exposure debate. *Journal of Communication, 59*, 676-699. doi: 10.1111/j.1460-

2466.2009.01452.x

Garrett, R. K., Carnahan, D., & Lynch, E. (2013). A turn toward avoidance? Selective exposure

to online political information, 2004-2008. *Political Behavior*, *35*, 113-134. doi:

10.1007/s11109-011-9185-6

Garrett, R. K., Gvirsman, S. D., Johnson, B. K., Tsfati, Y., Neo, R., & Dal, A. (2014).

Implications of pro- and counter-attitudinal information exposure for affective

polarization. *Human Communication Research, 40*, 309-332. doi: 10.1111/hcre.12028

Gil de Zúñiga, H., Correa, T., & Valenzuela, S. (2012). Selective exposure to cable news and

immigration in the U.S. *Journal of Broadcasting & Electronic Media*, *56*, 597-615. doi:

10.1080/08838151.2012.732138

Graf, J., & Aday, S. (2008). Selective attention to online political information. *Journal of

Broadcasting & Electronic Media, 52*, 86-100. doi: 10.1080/08838150701820874

Gvirsman, S. D. (2014). It's not that we don't know, it's that we don't care: Explaining why

selective exposure polarizes attitudes. *Mass Communication & Society, 17*, 74-97. doi: 10.1080/15205436.2013.816738

Hart, W., Albarracín, D., Eagly, A. H., Brechan, I., Lindberg, M. J., & Merrill, L. (2009). Feeling validated versus being correct: A meta-analysis of selective exposure to information. *Psychological Bulletin*, *135*, 555–588. doi: 10.1037/a0015701

Hayes, A. F., & Matthes, J. (2009). Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. *Behavior Research Methods, 41*, 924-936. doi: 10.3758/BRM.41.3.924

Hovland, C. I., Janis, I. L., & Kelley, H. H. (1953). *Communication and persuasion: Psychological studies of opinion change.* New Haven, CT: Yale University Press.

Hovland, C. I., & Weiss, W. (1951). The influence of source credibility on communication effectiveness. *Public Opinion Quarterly*, *15*, 635–650. doi: 10.1086/266350

Iyengar, S., & Hahn, K. S. (2009). Red media, blue media: Evidence of ideological selectivity in media use. *Journal of Communication, 59*, 19-39. doi: 10.1111/j.1460-2466.2008.01402.x

Jang, S. M. (2014a). Challenges to selective exposure: Selective seeking and avoidance in a multitasking media environment. *Mass Communication and Society, 17*, 665-688. doi: 10.1080/15205436.2013.835425

Jang, S. M. (2014b). Seeking congruency or incongruency online? Examining selective exposure to four controversial science issues. *Science Communication, 36,* 143-167. doi: 10.1177/1075547013502733

Johnson, T. J., & Kaye, B. K. (2013). The dark side of the boon? Credibility, selective exposure and the proliferation of online sources of political information. *Computers in Human*

Behavior, 29, 1862-1871. doi: 10.1016/j.chb.2013.02.011

Johnson, T. J., Zhang, W., & Bichard, S. L. (2011). Voices of convergence or conflict? A path

analysis investigation of selective exposure to political websites. *Social Science*

Computer Review, 29, 449-469. doi: 10.1177/0894439310379962

Knobloch, S., Hastall, M., Zillmann, D., & Callison, C. (2003). Imagery effects on the selective

reading of Internet newsmagazines: A cross-cultural examination. *Communication*

Research, 30, 3-29. doi: 10.1177/0093650202239023

Knobloch-Westerwick, S. (2012). Selective exposure and reinforcement of attitudes and

partisanship before a presidential election. *Journal of Communication, 62*, 628-642. doi:

10.1111/j.1460-2466.2012.01651.x

Knobloch-Westerwick, S. (2015). *Choice and preference in media use: Advances in selective*

exposure theory and research. New York, NY: Routledge.

Knobloch-Westerwick, S., Mothes, C., Johnson, B. K., Westerwick, A., & Donsbach, W. (2015).

Political online information searching in Germany and the U.S.: Confirmation bias,

source credibility, and attitude impacts. *Journal of Communication*, *65*, 489-511. doi:

10.1111/jcom.12154

Krosnick, J. A., Boninger, D. S., Chuang, Y. C., Berent, M. K., & Carnot, C. G. (1993). Attitude

strength: One construct or many related constructs? *Journal of Personality and Social*

Psychology, 65, 1132-1151. doi: 10.1037/0022-3514.65.6.1132

Kumkale, G. T., & Albarracín, D. (2004). The sleeper effect in persuasion: A meta-analytic

review. *Psychological Bulletin*, *130*, 143-171. doi: 10.1037/0033-2909.130.1.143

Layman, G. C., Carsey, T. M., & Horowitz, J. M. (2006). Party polarization in American

politics: Characteristics, causes, and consequences. *Annual Review of Political Science,*

9, 83-110. doi: 10.1146/annurev.polisci.9.070204.105138

Levendusky, M. S. (2013). Why do partisan media polarize viewers? *American Journal of Political Science, 57*, 611-623. doi: 10.1111/ajps.12008

Lowin, A. (1967). Approach and avoidance: Alternate modes of selective exposure to information. *Journal of Personality and Social Psychology, 6*, 1-9. doi: 10.1037/h0024531

McGuire, W. J. (1989). Theoretical foundations of campaigns. In R. E. Rice & C. K. Atkin (Eds.), *Public communication campaigns* (pp. 43-66). Thousand Oaks, CA: Sage.

Meffert, M. F., Chung, S., Joiner, A. J., Waks, L., & Garst, J. (2006). The effects of negativity and motivated information processing during a political campaign. *Journal of Communication, 56*, 27-51. doi: 10.1111/j.1460-2466.2006.00003.x

Metzger, M. J., Hartsell, E. H., & Flanagin, A. J. (in press). Cognitive dissonance or credibility? A comparison of two theoretical explanations for selective exposure to partisan news. *Communication Research.* doi: 10.1177/0093650215613136

Pacini, R., & Epstein, S. (1999). The relation of rational and experiential information processing styles to personality, basic beliefs, and the ratio-bias phenomenon. *Journal of Personality and Social Psychology, 76*, 972-987. doi: 10.1037/0022-3514.76.6.972

Petty, R. E., Briñol, P., & Priester, J. R. (2009). Mass media attitude change: Implications of the elaboration likelihood model of persuasion. In J. Bryant & M. B. Oliver (Eds.), *Media effects: Advances in theory and research* (pp. 125-164). New York, NY: Routledge.

Petty, R. E., & Cacioppo, J. T. (1977). Forewarning, cognitive responding, and resistance to persuasion. *Journal of Personality and Social Psychology*, *35*, 645-655. doi: 10.1037/0022-3514.35.9.645

Petty, R. E., Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant of

argument-based persuasion. *Journal of Personality and Social Psychology, 41,* 847-855.

doi: 10.1037/0022-3514.41.5.847

Petty, R. E., Kasmer, J. A., Haugtvedt, C. P., & Cacioppo, J. T. (1987). Source and message

factors in persuasion: A reply to Stiff's critique of the elaboration likelihood model.

Communication Monographs, 54, 233-249. doi: 10.1080/03637758709390229

Pornpitakpan, C. (2004). The persuasiveness of source credibility: A critical review of five

decades' evidence. *Journal of Applied Social Psychology, 34*, 243-281. doi:

10.1111/j.1559-1816.2004.tb02547.x

Prior, M. (2013). Media and political polarization. *Annual Review of Political Science, 16,* 101-

127. doi: 10.1146/annurev-polisci-100711-135242

Smith, S. M., Fabrigar, L. R., & Norris, M. E. (2008). Reflecting on six decades of selective

exposure research: Progress, challenges, and opportunities. *Social and Personality

Psychology Compass, 2*, 464-493. 10.1111/j.1751-9004.2007.00060.x

Stroud, N. J. (2008). Media use and political predispositions: Revisiting the concept of selective

exposure. *Political Behavior, 30*, 341-366. doi: 10.1007/s11109-007-9050-9

Stroud, N. J. (2010). Polarization and partisan selective exposure. *Journal of Communication,

60*, 556-576. doi: 10.1111/j.1460-2466.2010.01497.x

Taber, C. S., & Lodge M. (2006). Motivated skepticism in the evaluation of political beliefs.

American Journal of Political Science, 50, 755-769. doi: 10.1111/j.1540-

5907.2006.00214.x

The White House. (2010). Remarks by the president at University of Michigan spring

commencement. Retrieved from https://www.whitehouse.gov/the-press-office/remarks-

president-university-michigan-spring-commencement

Tormala, Z. L., Briñol, P., & Petty, R. E. (2006). When credibility attacks: The reverse impact of source credibility on persuasion. *Journal of Experimental Social Psychology, 42,* 684-691. doi: 10.1016/j.jesp.2005.10.005

Tormala, Z. L., & Clarkson, J. J. (2007). Assimilation and contrast in persuasion: The effects of source credibility in multiple message situations. *Personality and Social Psychology Bulletin, 33,* 559-571. doi: 10.1177/0146167206296955

Tsfati, Y., & Cappella, J. N. (2005). Why do people watch news they do not trust? The need for cognition as a moderator in the association between news media skepticism and exposure. *Media Psychology, 7*, 251-271. doi: 10.1207/S1532785XMEP0703_2

Webster, J. G., & Ksiazek, T. B. (2012). The dynamics of audience fragmentation: Public attention in an age of digital media. *Journal of Communication, 62*, 39-56. doi: 10.1111/j.1460-2466.2011.01616.x

Westerwick, A., Kleinman, S., & Knobloch-Westerwick, S**.** (2013). Turn a blind eye if you care: Impacts of attitude consistency, importance, and credibility on seeking of political information and implications for attitudes. *Journal of Communication, 63*, 432-453. doi: 10.1111/jcom.12028

Winter, S., & Krämer, N. C. (2012). Selecting science information in Web 2.0: How source cues, message sidedness, and need for cognition influence users' exposure to blog posts. *Journal of Computer-Mediated Communication, 18*, 80-96. doi: 10.1111/j.1083-6101.2012.01596.x

Zillmann, D., Knobloch, S., & Yu, H.-S. (2001). Effects of photographs on the selective reading of news reports. *Media Psychology, 3*, 301-324. doi: 10.1207/S1532785XMEP0304_01
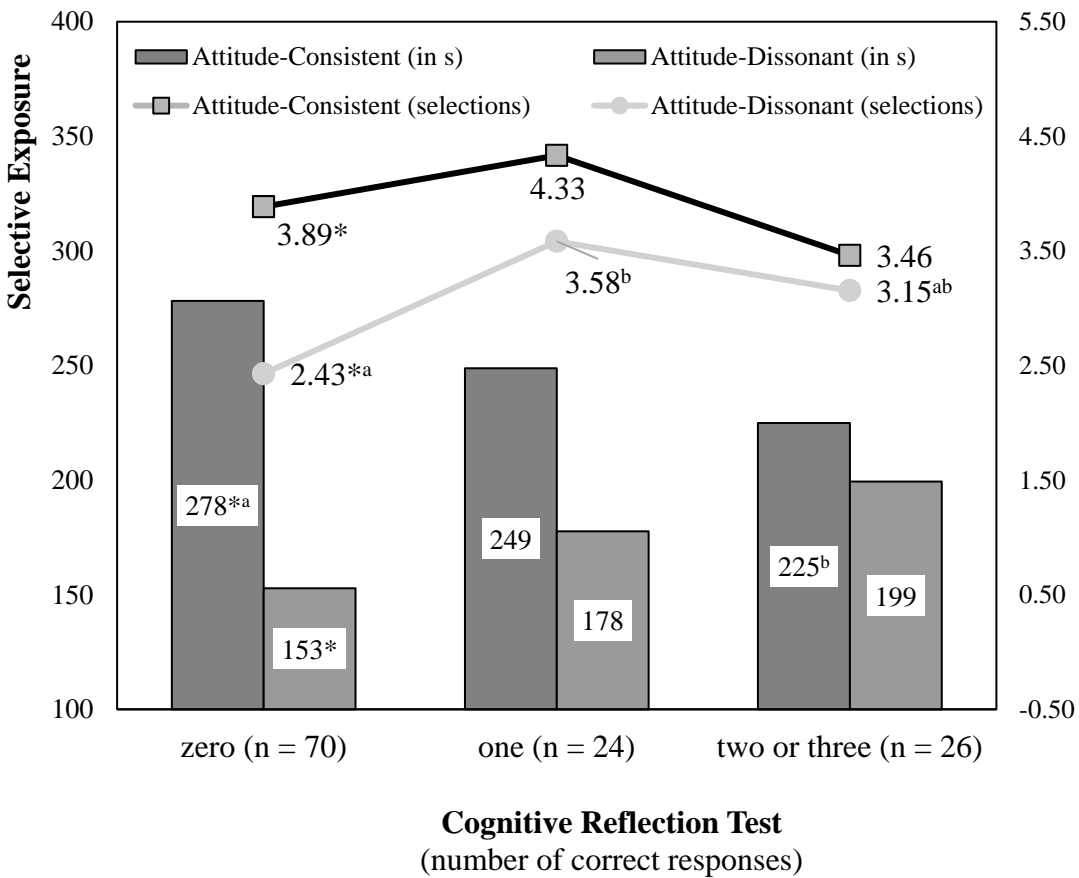
Figure 1. Confirmation bias in selective exposure as a function of attitude consistency of messages and information users' cognitive reflection.

Note. Means with asterisks within a subgroup of participants denote a significant difference, $p <$ .05. Means with different superscripts within a data series denote a significant difference, $p <$ .05.