

**Living Congenially:
Contextual, Relational, and Metacognitive Facilitators of Agreeable Political Information
Environments**

by

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DEDICATION

To the two people whose love and sacrifice truly made this dissertation possible: My dad Paul,
and my partner Kate.

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“Negative feedback may be fun, but it is far less brave than endorsing something unproven and providing room for it to grow.”

-Ed Catmull, Pixar Animation Studios

In keeping with the theme of this dissertation, I’ve actively surrounded myself with some truly wonderful and supportive people over the years. I want to acknowledge how grateful I feel to have had this support network of friends, family, advisors, and colleagues through my graduate school career. These superb people consistently find positivity in the world and give it room to thrive, and I have greatly benefited from them.

To start from the beginning of my social psychology career, I want to extend my deepest gratitude to Sam Sommers at Tufts. I met Sam when I was a freshman in his Intro to Social Psychology lecture, and within just a couple of months I was a Psychology major with Sam as my advisor. Over the next four years, Sam encouraged me to get involved in his lab and pursue research opportunities outside of Tufts, and he eventually oversaw my senior honors thesis. Fortunately, my relationship with Sam did not end when I graduated, and Sam has continued to be an important mentor and friend to me ever since. Sam’s influence will pop up a couple more times throughout these acknowledgments, and it’s safe to say that were it not for his guidance and mentorship, I would not be a social psychologist today. Sam is also a member of an

incredible psychology department that “birthed” me into the psychology world (as he recently put it), with many people whom I’ve felt lucky to know and learn from: Nalini Ambady, Laura Babbitt, Keith Maddox, and Simon Howard, just to name a few.

Once I decided to apply to graduate school, I’m so glad I took two of Sam’s biggest pieces of advice: Apply to Michigan, and specifically apply to work with Phoebe Ellsworth (who also happened to be Sam’s graduate advisor). Although I knew that Michigan was a top program, I was hesitant about going to the Midwest, a new place for me with few connections to any family or friends. “Just apply,” Sam said. “You won’t regret it.” Sam, you were so right, and I knew that from the first minute I met Phoebe. I’ve never met someone—and probably never will again—with Phoebe’s particular blend of intellect, curiosity, wit, humor, kindness, empathy, patience, and humility. Every time I’ve met with Phoebe over the years, I walked away not only having learned something new, but also still laughing. While always pushing my work toward intellectual rigor, Phoebe also reminded me that these academic pursuits can and should be fun. Accordingly, I am grateful to Phoebe for not just teaching me from her own deep well of knowledge and experience, but also for taking risks and pursuing new intellectual journeys with me. Over the years, I came to Phoebe with a number of research ideas that I knew were not strictly in her wheelhouse, but I never doubted that she would dive into a new area of social psychology with me in order to be the most effective mentor that she could. Phoebe truly embodies the quote at the top of these acknowledgments, always striving to find the positive elements of an idea and build from there. Despite her many scholarly accomplishments, she cares even more about mentoring; this is obvious to every person in the Michigan social psychology program, whether or not they are a “Phoebe student.” I’m beyond lucky that I applied to Michigan just in time to be one of Phoebe’s last graduate students. And as Phoebe nears the end

of her incredible career, the only thing I'm sad about is that I can't give a future applicant the same advice Sam gave me: Go work with Phoebe.

Another mentor who has supported me since day one in Michigan is Ali Earl. Ali was a fairly new professor when I arrived, but she graciously reached out to me to talk about research right away. We quickly found that we had many interests in common, and I've grown so much intellectually from our collaborations. Over the last five years, I've been fortunate to learn from Ali as a mentor, but also to get to know her as the sharp, warm, and hilarious person that she is. She's always there in the audience to smile and nod along with you when you're giving a talk, and to remind you that you're an expert in your subject matter during moments of self-doubt. When I applied to Michigan, I didn't know that I'd also be entering into a five-year collaboration with Ali, but I'm so thrilled that I've had that opportunity.

Of my three advisors, I met Kaitlin Raimi last, but our work together became a fundamental piece of my graduate school experience. (Thanks to Sam, again, for being an excellent academic match-maker.) Our collaborative research efforts motivated me in a way that few others did, and we also have one of the easiest and most comfortable working relationships that I've ever had. Kaitlin enthusiastically welcomed my initial proposal for a collaboration, and in addition to her cleverness, kindness, and creativity, her mentorship made me a much stronger researcher. As I've told Kaitlin several times, I only wish she had arrived at Michigan earlier in my graduate career!

To round out my dissertation committee members, I'm also thankful for the opportunity to have learned from and gotten to know Brian Weeks over this past year. Although I knew about Brian's areas of expertise when I asked him if he would join my committee, it turned out to be an

even better fit than I realized. Brian oriented me to research in new disciplines and significantly strengthened my work as a result.

Michigan is a fantastic place to be a graduate student, and there is a vast network of colleagues whom I've benefited from immensely. All the members of the Phoebe-Rich Lab, the HAILab, and the Decision Lab were critical in helping my research ideas blossom over the years. I especially appreciate Frank Yates for welcoming me to his lab for several years, even though he and I never had a research collaboration. Frank is one of the most intellectually curious and interesting people I've ever known, and his gracious feedback was always much appreciated.

All of my research would not have been possible without the amazing group of undergraduates whom I've been lucky to work with over the years: Kristen Amman, Kim Badgett, Riley Brantley, Michael Daniels, Steven Gilpin, Sanela Kalakovic, Elena Khutoretsky, Dayna Petkov, Niyati Rangnekar, and Lauren Vanwagoner. I loved getting to know each and every one of these people, and their effort and dedication to research and teamwork is extraordinary.

I also formed many deep friendships through Michigan Psychology, and I can't imagine my life without these wonderful people. I have to start, of course, with the clique (clique, clique, clique): Neil Lewis, Darwin Guevarra, Sarah Huff, and Peter Felsman. They are the best cohort I could have asked for and amazing friends (and collaborators!). There are many other great friends whom I'm been fortunate to know: Walt Sowden, Steve Tompson, Lauren Reed, Dave Hauser, Josh Wondra, Ariana Orvell, Jeff Zeman, Jenn Chudy, Qinggang Yu, and Briana Green. I really hope I'm not forgetting anyone, but regardless, I'm so thankful for your friendship.

At Michigan, I also made two of the best friends I've ever had: Hakeem Jefferson and Izzy Gainsburg. I met Hakeem on my first day in Ann Arbor, and it's only fitting that we initially

bonded over *Yeezus*. Hakeem has countless great qualities, but chief among them is his devotion to friendship. And although Izzy and I went to Tufts together, it took us being in the same graduate program to finally become the great friends that we were obviously meant to be. I'm so happy I've had the opportunity to learn what a truly fantastic human being Izzy is. Between Izzy and Hakeem, I've had the best (and smartest) social support system I could ever have asked for. It's hard to express how much I love these two guys.

On an extracurricular basis, I want to give a big shout-out to running for keep me sane and healthy throughout graduate school, and to my steadfast running buddies, Nick Michalak and Brent McDermott. Besides making me a stronger runner, I am thankful for the deep friendships that grew out of our long runs. And as long as I'm thanking non-academic sources of support, thanks to Kanye, James, Kendrick, Sufjan, Jeffery, Justin (both of them), Terrence, Aubrey, Frank, Vince, and many others for giving me daily confidence and inspiration. Sometimes, you just need someone to tell you to keep riding the wave and not take "no" for an answer.

There many family members who have supported me along this journey. I'm on the verge of gaining a bunch of wonderful new family members who have brought nothing but joy and laughter into my life: Patrick, Kent, Ashley, Sarah, Benjamin, Andrew, Elise, Caleb, Cole, and Cooper. Karen has also become a new parent to me, and I'm so grateful for it. Visiting Karen in Chicago has always meant walking into a welcoming home that was warm, funny, joyous, and full of delicious chili. Karen fiercely loves her family, and I'm very lucky to one of them.

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Of course, I have to thank my parents for their support, sacrifice, and love to help me reach this point. The addition of Lyn to my family several years ago has brought into my life a person whose love and dedication I am incredibly thankful for. I couldn't imagine not having Lyn in my life, and her support means everything to me. Lyn's routine generosity and selflessness towards those she loves—often in the form of baked goods—is an exceedingly rare quality, and I am amazingly fortunate to be her family. My dad, Paul, is the strongest and best person I've ever known. His devotion and sacrifice as a dad made my dreams and accomplishments possible, and it's impossible to overstate how lucky I was to grow up with him as my biggest cheerleader and greatest role model. My love and gratitude for him is immense, and I hope he knows there isn't a day that goes by when I don't think about how his qualities as a dad allowed me—and Lauren—to thrive. And although I can't share this milestone with my mom, I am here because she taught me not just how to love and support others, but to accept others' love and support when I needed it most.

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ABSTRACT

This dissertation examines how people find themselves in mostly congenial political information environments as a result of contextual, relational, and metacognitive factors. Specifically, the goal of this dissertation is to understand how selective exposure—the phenomenon by which people are more often exposed to congenial (vs. uncongenial) information (Hart et al., 2009)—is reached in multiple contexts. Selective exposure can be achieved via attitude selectivity, in which people actively choose exposure to information that validates their views over information that challenges those views (Hart et al., 2009), or *de facto* selectivity, in which people simply live in environments that facilitate exposure to more congenial (vs. uncongenial) information (Sears & Freedman, 1967). I examine these processes across 11 studies drawn from three areas of research. First, in an examination of contextual facilitators of selective exposure, I analyze results from a yearlong longitudinal study of American adults’ perceptions of climate change to assess whether people of differing beliefs about climate change: (a) sought out different types of weather or climate information; (b) varied in their perceptions about local and national weather; (c) and experienced different temperature and severe weather patterns in their local areas (“Climate Change Beliefs: Perceptual and Objective Variations”). Second, to examine relational facilitators of selective exposure, I present four studies of how people in relational dyads exchange information with each other. Specifically, I examine both how selectors choose information on behalf of others, and how recipients evaluate such information. From both perspectives, I examine how (a) likability between selectors and recipients, (b) attitudinal agreement between selectors and recipients, and (c) congeniality of selected or received

information influence selection and reception of information (“Blinded by Liking: Selective Exposure Within Dyadic Relationships”). Third, to assess metacognitive facilitators of selective exposure, I present six studies examining whether people who express belief superiority—the belief that one’s views are superior to alternative viewpoints—about various political issues can justify that alleged superiority by demonstrating superior issue-relevant knowledge. Furthermore, I explore how they seek out additional issue-relevant information (“Is Belief Superiority Justified by Superiority Knowledge?”). Together, these three projects suggest that selective exposure to mostly congenial (vs. uncongenial) information can be facilitated by contextual, relational, and metacognitive factors. I also discuss the implications of each set of results for the social psychological study of attitude selectivity and *de facto* processes, as well as implications for future attempts to intervene and reduce biased information consumption.

Keywords: selective exposure; motivated reasoning; belief superiority; information seeking

CHAPTER I

Social Psychological Factors in Selective Exposure

People generally prefer exposure to information that supports their preexisting attitudes over information that challenges those views (Festinger, 1957). The phenomenon by which people are more often exposed to agreeable information, known as *selective exposure*, serves to validate one's worldviews (Hart, Albarracín, Eagly, Brechan, Lindberg, & Merrill, 2009) while also avoiding the discomfort associated with confronting information that challenges or defies the validity of one's views (Festinger, 1957). Research on selective exposure over many decades indicates a robust effect that has been demonstrated in studies across a variety of domains (with a meta-analytic mean $d = 0.36$; Hart et al., 2009).

Historically, research has discussed two possible processes that facilitate selective exposure outcomes. The first process, known as *attitude selectivity*, proposes that people actively choose exposure to information that validates their views over information that challenges those views (Brock & Balloun, 1967; Earl, Albarracín, Durantini, Gunnoe, Leeper, & Levitt, 2009; Earl & Nisson, 2015; Festinger, 1957; Hart et al., 2009). This attitude selectivity hypothesis suggests that selective exposure is an active process of information exposure, and selective exposure via attitude selectivity has been demonstrated in a variety of contexts. For instance, in Brock and Balloun's (1967) study of smoking and non-smoking adults' exposure to messages either supporting or disputing the link between smoking and lung cancer, participants were more likely to remove static noise during the audio messages when it supported (vs. challenged) their views and behaviors. In another case, Earl and colleagues (2009) found that individuals at risk of

HIV were more likely to pay attention to HIV-prevention information when they are already practiced those safe behaviors; on the other hand, people who were not well-versed in such preventative behaviors were less likely to pay attention to instructional materials. In both examples, people actively chose exposure—and selectively paid more attention—to information that validated their existing beliefs and behaviors.

However, another perspective, known as *de facto selectivity*, de-emphasizes the individual choice characterized by the attitude selectivity hypothesis, instead suggesting that selective exposure outcomes may be achieved more passively. That is, rather than actively choosing whether to be exposed to information that supports one's views, people may simply exist in environments that facilitate exposure to more congenial (vs. uncongenial) information (Freedman & Sears, 1965; Sears & Freedman, 1967). Under this perspective, individuals find themselves in mostly congenial environments because their attitudes were shaped by those environments in the first place. To date, there has been considerably less research on the *de facto* perspective, but some research points to possible ways in which it may manifest. For instance, research has found that presentational order of congenial and uncongenial political information—a contextual effect operating outside of individual choice—can affect participants' evaluations of that information, even when they already have strong attitudes about the issue: Individuals who saw uncongenial information first, regardless of whether it was chosen or not, demonstrated a significantly reduced congeniality bias in their evaluations of the information (Hall, Earl, Albarracín, & Jones, in prep). Thus, a choice-irrelevant factor of presentational order facilitated information environments that participants found more agreeable, even though some of that information was, on its face, inconsistent with their attitudes.

A goal of this dissertation is to explore different social psychological factors that influence how people maintain mostly congenial information environments across a variety of contexts. Across the three different projects that are detailed in Chapters 2, 3, and 4, this dissertation will explore factors that make selective exposure to congenial information more likely. And where applicable, this dissertation will assess whether these selective exposure outcomes were achieved through processes more in line with attitude selectivity, *de facto* selectivity, or a combination of the two. Using data from 10 laboratory and online experiments and one longitudinal study, this dissertation will examine how people in a variety of different political information contexts exist within congenial information environments via attitude selectivity, *de facto* selectivity, or the two processes operating in tandem.

For several reasons, the scope of the research in this dissertation focuses specifically on selective exposure in *political* information contexts. Political beliefs and attitudes tend to be more subject to biases in favor of congenial information and are especially likely to reflect one's values and elicit defensive motivational processes, thereby heightening congenial selective exposure biases (Hart et al., 2009; Johnson & Eagly, 1989). Indeed, political attitudes that are relevant to personal values tend to be exceptionally strong (Tetlock, 2002), are likely to be perceived by the attitude holder as more factual than other types of attitudes (Skitka, Bauman, & Sargis, 2005), and tend to be very difficult to change (Graham, Haidt, & Nosek, 2009). For these reasons, political information environments may be especially likely to be biased in a congenial direction (Garrett & Stroud, 2014), and such environments can be consequential. For instance, biased media consumption can promote inaccurate beliefs (Garrett, Weeks, & Neo, 2016), which can often be quite difficult to correct (Garrett & Weeks, 2013; Nyhan & Reifler, 2010; Nyhan, Reifler, & Ubel, 2013). But, some research also suggests that fears about overly congenial

political information environments may be exaggerated (Nelson & Webster, 2017; Weeks, Ksiazek, & Holbert, 2016), meaning that this dissertation may also contribute to this debate.

Political information environments are also a timely topic, particularly in the United States. Over the last decade or so, the ways in which news is consumed and disseminated by Americans has changed dramatically. Internet-based platforms, and particularly social media (e.g., Facebook, Twitter, Snapchat), have become new and prevalent forms of news distribution, disrupting and perhaps diminishing the roles of the traditional forms of mass communication (e.g., newspapers, television). Thus, information exchange and consumption has shifted away from being primarily associated with historically credible news outlets and pundits, and increasingly in the hands of everyday people with Internet access (Flanagin, 2017). As of 2017, nationally representative surveys found that 67% of Americans reported getting at least some news via social media (Shearer & Gottfried, 2017). However, these same social media outlets have also been criticized recently for potentially creating information “echo chambers” by which people are primarily exposed only to information that they agree with (Madrigal, 2017; Sunstein, 2001; Thompson & Vogelstein, 2018), being used for illicit purposes by foreign actors seeking to disrupt democratic processes in the 2016 Presidential Election (Shane, 2018), and stirring up discontent in response to a heavily publicized school shootings (Frenkel & Wakabayashi, 2018), among others. Thus, the current moment in the U.S.—with the interaction of political issues and new information environments via social media—is a particularly useful time to study selective exposure behavior with regards to political information.

Over the next several chapters, this dissertation will present research that addresses how selective exposure outcomes are facilitated by three types of social psychological processes: (1) motivated interpretations of attitude-relevant information in one’s environment; (2) selection and

reception of information in dyadic relationships; and (3) metacognitions about the relative correctness or superiority of one's political beliefs.

First, Chapter 2 will investigate how a sample of 600 American adults utilized information about local and national weather—in terms of both media coverage and perceptions of actual weather where they lived—to inform their climate change beliefs over the course of a one-year longitudinal study. Specifically, Chapter 2 will examine the question of whether participants used weather information to inform their beliefs about climate change, or if those beliefs guided their perceptions of local and national weather. The first proposition would suggest that contextual factors might shape climate change beliefs—indicating evidence of *de facto* selectivity—whereas the second proposition would suggest that attitude selectivity effects drive motivated interpretations of relevant weather and climate information.

Next, Chapter 3 will cover a series of four studies about how people share political information with each other and evaluate that information—from the perspectives of both the selector and the recipient—to determine: (a) whether people take account of information recipients' attitudes and beliefs when selecting political information for them to read; (b) how relational factors such as likability influence selectors' choices and recipients' evaluations of political information; and (c) whether information recipients consider that the information that was given to them was chosen because it fit their preferences. As such, Chapter 3 will address both attitude selectivity and *de facto* selectivity effects on individuals' selection and processing of political information. Participants showing preferential exposure and evaluation for congenial (vs. uncongenial) evaluation would signal attitude selectivity effects, whereas contextual influences (e.g., the selector-recipient relationship) on exposure and evaluation would indicate *de facto* processes.

Then, Chapter 4 will cover a series of six studies examining how people's metacognitions about their political beliefs—specifically, how they think about the superiority of their beliefs relative to other viewpoints on that issue—affect information seeking relevant to those beliefs. In addition, Chapter 4 illustrates the metacognitive processes that can facilitate increased selective exposure via attitude selectivity processes, but also how this process creates a feedback cycle in which individuals create environments that perpetuate their (sometimes) erroneous beliefs that are relatively immune to correction. As such, Chapter 4 examines belief superiority as a moderator of attitude selectivity effects, but also acknowledges the possibility that participants' information environments influenced their belief superiority, a potential *de facto* influence.

Lastly, Chapter 5 will consider what Chapters 2, 3, and 4 can add to the literatures on selective exposure and motivated reasoning (Kunda, 1990), with a particular focus on what these studies reveal about ways to interrupt biased selective exposure processes. In addition, Chapter 5 will discuss not only how the results of Chapters 2-4 contribute to social psychological research about attitude selectivity, but also how those results contribute to the study of *de facto* selective exposure, for which there is significantly less research and less understanding of how it may manifest in everyday information environments.

CHAPTER II

Climate Change Beliefs: Perceptual and Objective Variations

Many Americans are reluctant to accept the existence of global climate change. Despite the fact that 97 percent of scientists endorse anthropogenic climate change, only 54-65% of Americans believe that climate change can be attributed to human behavior (Cook et al., 2013; Hornsey, Harris, Bain, & Fielding, 2016; Leiserowitz, Maibach, Roser-Renouf, & Hmielowski, 2012). Because it is widely believed that people who believe in climate change are more likely to behave in ways that combat its effects (Hornsey et al., 2016; Lorenzoni & Pidgeon, 2006; Pidgeon, 2012; Read, Bostrom, Morgan, Fischhoff, & Smuts, 1994), much research investigates the factors that influence beliefs about climate change. One factor is how people perceive the weather: Personally experiencing climate change-related weather patterns can influence belief in climate change (Akerlof, Maibach, Fitzgerald, Ceden, & Neuman, 2013; Borick & Rabe, 2014; Gifford et al., 2009; Myers, Maibach, Roser-Renouf, Akerlof, & Leiserowitz, 2012). However, not all Americans interpret weather and climate patterns similarly, potentially affecting their conclusions about climate change. The present study utilizes results from a one-year longitudinal study of Americans' climate beliefs to better understand how personal experiences of temperature variations and severe weather, perceptions of local and national weather, and variations in climate-relevant media consumption can help understand why some believe in climate change, but others do not. Do climate change believers and skeptics exist in different information environments—whether that be different media intake, or exposure to different weather and climate patterns—or do they merely perceive the same weather events differently?

Bringing a Distant Problem Closer

Americans are not particularly alarmed about climate change; generally, they do not see climate change as an urgent problem (Lorenzoni & Pidgeon, 2006; Read et al., 1994) and would rather take a “wait-and-see” approach to taking mitigation actions (Sterman & Sweeney, 2007). This lack of urgency is likely attributable to the fact that many Americans do not see climate change as having concrete, local consequences (Leiserowitz, 2006). In a study of 18 countries (including the United States), Gifford and colleagues (2009) found that although members of most of the countries believed that climate change will have future consequences, they also mostly believed that climate change would have worse consequences in distant places than close to home.

As a result of this tepid response to climate change, many researchers have suggested that because worry and concern about climate change are essential ingredients to eventual mitigation behavior, research should attempt to understand what influences Americans’ concern about the issue. Weber (2006) suggests that climate change’s problem is that it does not engender sufficient concern: Because “personal experience with noticeable and serious consequences of global warming is still rare in many regions of the world,” many people fail to experience “visceral reactions towards the risk of global warming” that would promote behavior to reduce that risk (p. 103). For those who are unconvinced about the existence of climate change, personal experience with its consequences could have “vivid and memorable” effects, leading skeptics to recognize the problem more readily (Weber, 2013, p. 313).

In recent years, some researchers have answered this call to action by studying the effects of personal experience—subjective and objective—with weather and climate change, and have found that perceived personal experience with climate change can have significant effects on

belief in climate change and concern about the issue. Akerlof and colleagues (2013) found that for residents of one county in Michigan, the perception of personally experiencing climate change was associated with heightened perceived risks from climate change. Myers and colleagues (2012) found, especially for those who were less engaged with climate change, that perceived personal experience could lead to revising and updating people's beliefs about climate change. Bohr (2017) found that extreme temperature abnormalities (against a five-year temperature baseline) could influence beliefs about climate change. And encouragingly, participants' perceptions of their local weather conditions have been shown to be fairly accurate (Akerlof et al., 2013; Howe, Boudet, Leiserowitz, & Maibach, 2014; although see Marlon et al., 2018 for an opposite effect).

There are, however, some important limitations on the effects of temperature and weather abnormalities on climate change perceptions. Some studies find effects for all weather, some only for warm or cold weather, and some only for extreme weather events (e.g., hurricanes or tornadoes). Several studies found that only warmer temperatures lead to increases in belief in the existence of climate change (Borick & Rabe, 2017; Egan & Mullin, 2012; Howe & Leiserowitz, 2013; Joireman, Barnes, & Truelove, 2010; Risen & Critcher, 2011; Zaval, Keenan, Johnson, & Weber, 2014), with some even finding that colder temperatures have the opposite effect (Egan & Mullin, 2012; Hamilton & Stampono, 2013). But others have found that cold weather can also lead to increases in climate change belief (Akerlof et al., 2013; Capstick & Pidgeon, 2014), and still others have found that only extreme weather events, but not temperature fluctuations, influence climate change beliefs (Shao, 2016). Finally, some research fails to find any effects of temperature or weather abnormalities at all (Brulle, Carmichael, & Jenkins, 2012; Carlton et al., 2016; Shao & Goidel, 2016). Thus, although many researchers suggest that temperature and

weather variations—subjective and objective—can influence climate change beliefs, the effects are somewhat inconsistent.

Beliefs and Biased Reasoning

The effects of temperature and weather variations on climate change beliefs are often limited by biases that affect how they are interpreted. In particular, motivated reasoning processes can lead people to interpret belief- or value- relevant information in ways that facilitate desired conclusions (Ditto & Lopez, 1992; Kunda, 1990). Research across a variety of political and non-political domains has demonstrated that people may employ differential evaluative criteria and information search strategies to help them reach a desired conclusion about an issue they care about (Gaines, Kuklinski, Quirk, Peyton, & Verkuilen, 2007; Hart, Albarracín, Eagly, Brechan, Lindberg, & Merrill, 2009; Lodge & Hamill, 1986; Nisbet, Cooper, & Garrett, 2015; Taber & Lodge, 2006).

Because climate change is a politically contentious issue in the U.S., motivated reasoning can influence how people interpret climate-relevant information. Much as Lord, Ross, and Lepper (1979) found that participants interpreted mixed evidence about the death penalty in favor of their attitude about the issue, evidence of motivated reasoning has been documented in the influence of climate change beliefs on perceptions of weather and temperature patterns. For instance, although Myers and colleagues (2012) found that weather patterns can lead to updating climate change beliefs, this effect was limited to those who were not highly engaged with climate change; for those who were highly engaged, motivated reasoning processes led them to interpret weather information as consistent with their beliefs. Bohr (2017) found that political polarization about climate change is most acute in states experiencing extreme temperature anomalies (in both warm and cold directions), suggesting that people on both sides of the issue interpret the

temperature deviations as consistent with their desired conclusions and further dig in their heels on the issue. Capstick and Pidgeon (2014) found that interpretations of cold weather largely depended on respondents' existing views on climate change: those who believed in the existence of climate change were more likely to see the cold weather as related to climate change. In a study of Americans living on the Gulf Coast, Shao and Goidel (2016) found that preexisting beliefs about climate change colored interpretations of whether temperature changes, drought, flooding, and hurricanes were related to climate change. Similarly, Marlon and colleagues (2018) found that Florida residents' risk perceptions of climate change were more closely linked to beliefs than personal weather experiences. Furthermore, research has found that climate believers and skeptics do not differ in their education levels or abilities to understand numeric and scientific information (Drummond & Fischhoff, 2017; Kahan, 2013; Kahan et al., 2012; Sterman & Sweeney, 2007); beliefs guide how scientific information is interpreted, and not the other way around.

Beliefs and Biased Media Consumption

The type of media one consumes can be another critical factor influencing how people are likely to interpret climate-relevant information. In terms of cable news viewership, viewing Fox News is negatively associated with believing in climate change, but viewing CNN or MSNBC is positively related to belief; however, these effects were more pronounced for Republicans, whereas Democrats' climate beliefs were less sensitive to media effects (Feldman, Maibach, Roser-Renouf, & Leiserowitz, 2012). Similarly, greater attention to science news is associated with greater perceptions of harm from climate change for conservatives, but not for liberals, who tend to already perceive harm from climate change (Hart, Nisbet, & Myers, 2015). Brulle and colleagues (2012) found that media coverage has a significant effect on concern about

climate change, largely because it is seen as an indicator of what political elites—such as political party leaders—think about the issue. Overall, Hmielowski and colleagues (2014) found that media coverage influences climate change beliefs as a function of trust in scientists: Conservative-oriented media decrease trust in scientists and thereby decrease belief in climate change, whereas the opposite occurs for non-conservative (i.e., moderate or liberal) media.

Although climate change beliefs and perceptions can be shaped by weather and temperature variations, motivated reasoning and media research also indicate that associations between weather perceptions and climate change beliefs are likely to vary. Thus, it is critical to account for all of these factors when examining the effect of personal experience with climate change on beliefs, and for whom this effect is most likely to occur.

Current Study

The present study builds on previous research on climate change beliefs, weather perceptions, and information consumption by addressing the question: Do different types of beliefs about climate change relate to different types of climate-relevant information environments? That is, do climate change believers and skeptics consume different types of media, perceive weather and climate variations differently, and say they experience different types of weather and climate changes? To address these questions, the present study utilized data from a longitudinal study of American adults' perceptions of climate change beliefs over the course of one year. A longitudinal design, which allows for within-subjects comparisons over time, allows for research questions that cannot be answered by single-wave studies. For instance, do climate change beliefs fluctuate over time, perhaps in response to seasonal changes (as previous research might suggest)? And if so, are people more likely to pay attention to weather

and temperature deviations in certain seasons, which might exert differential influences on climate beliefs?

Thus, the goals of the present study can be reduced to the question: Do believers and skeptics pay attention to different types of climate and weather information, and does this attention differ by time or seasons throughout the course of a year? Do they attend to different information about climate change, or do they interpret the same weather events differently?

Method

Participants

604 American adults were recruited via Amazon Mechanical Turk (MTurk) for a longitudinal study to assess their beliefs about and perceptions of climate change. Sample size was determined by funding constraints and our payment strategy (details below). Initial recruitment took place in July 2014 and the study concluded one year later, after seven assessment points occurring approximately every eight weeks, in July 2015. By Time 2, four participants were eliminated for various reasons: two participants' self-identifications (MTurk worker ID) could never be linked to future surveys, and two participants used the same MTurk worker ID and provided interchangeable personal details at Times 1 and 2 and did not respond when the research team sought clarification. The follow-up surveys were only accessible to the remaining 600 MTurk workers (61.67% male; $M_{\text{age}} = 32.10$ years; 80.50% White/Caucasian; 88.20% reported at least some college; 79.90% identified with Democratic Party).

The final sample ($N = 600$) was geographically diverse and similar to the geographic distribution of the United States (see Table 1; U.S. Census Bureau, 2010). In addition, the sample was representative of the distribution of Americans across urban and rural areas. Using the Urban Influence Code (UIC; United States Department of Agriculture Economic Research

Service, 2013), a classification which categorizes U.S. counties into 12 groups based on population and access to economic centers, participants' ZIP codes at Time 1 were matched to the corresponding UIC. Next, these 12 categories were condensed into three groups (as recommended by USDA, 2013): "metro" counties, with high populations and close access to economic centers; "nonmetro" counties, with medium populations and adjacency to large or small economic centers; and "nonmetro noncore" counties, or rural or suburban areas not adjacent to large or small economic centers. The present study's sample was distributed similarly to that of the U.S.: 86.3% of the present study's participants lived in "metro" counties (i.e., areas with high populations and close access to metropolitan centers), and 85.0% of Americans resided in these "metro" counties in 2010. Additionally, 7.80% of the present study's sample lived in "nonmetro" counties (vs. 8.80% of the U.S.), and 6.60% of the sample lived in "nonmetro noncore" counties (vs. 5.90% of the U.S.; United States Department of Agriculture Economic Research Service, 2013). A chi-square test found no relationship between political party identification and UIC (United States Department of Agriculture Economic Research Service, 2013), $\chi^2(2, N = 593) = 1.68, p = .431^1$.

¹ Seven participants declined to enter their political party preference at Time 1.

Table 1

Geographic distributions of Time 1 MCAS sample & U.S. population (U.S. Census, 2010)

<u>ZIP Zone</u>	<u>MCAS %</u>	<u>U.S. %</u>
0 (CT, MA, ME, NH, VT, RI, NJ)	6.67	7.53
1 (DE, NY, PA)	11.67	10.68
2 (DC, MD, NC, SC, VA, WV)	11.83	9.84
3 (AL, FL, GA, MS, TN)	13.83	13.79
4 (IN, KY, MI, OH)	17.50	10.44
5 (IA, MN, WI, MT, ND, SD)	6.50	5.35
6 (IL, KS, MO, NE)	5.17	7.61
7 (AR, LA, OK, TX)	7.33	11.77
8 (AZ, CO, ID, NM, NV, UT, WY)	6.17	6.83
9 (AK, CA, HI, OR, WA)	13.33	16.16

Procedure

At Time 1 recruitment, all participants were informed of the longitudinal nature of the study and the commitment involved in participation: Answering surveys about climate change beliefs and perceptions seven times over the course of one year, between July 2014 and July 2015. For each new survey, participants were messaged a few days before the survey's launch, at the time of the survey's launch, and the day before the expiration of the surveys. Each follow-up survey was available for five days. Participants were paid \$0.50 for completion of the Time 1 survey, and compensation increased progressively at each successive time point. Participants were subsequently paid: \$1.00 at Time 2; \$2.00 at Time 3; \$3.00 at Time 4; \$4.00 at Time 5; \$6.00 at Time 6; and \$7.00 at Time 7. For participants who completed all seven surveys, an additional \$5.00 bonus was available at the end of the study.

Retention

Throughout the study, retention was high: 73% ($n = 438$) of the final sample of 600 participants returned for Time 2 (a normal decrease in participation in longitudinal studies; Hansen, Tobler, & Graham, 1990; Ribisl et al., 1996). An average of 413 participants (68.8% of the final sample) completed all of the surveys from Times 2-7. Lastly, 291 participants (48.5% of the final sample) completed all seven surveys. The only demographic factor that influenced retention at Time 2 was age ($F(1, 596) = 22.22, p < .001, \eta_p^2 = .04$): Participants who returned for Time 2 were slightly older ($M = 33.25$ years, $SD = 10.29$) than those who did not ($M = 29.14$ years, $SD = 7.87$), a small mean difference that did not span multiple generations. Age also predicted the total number of surveys completed, such that older participants completed more surveys ($B = 0.05, SE = 0.01, p < .001$). Lastly, political party identification influenced the total number of surveys completed, such that Republican-identifying participants completed slightly more surveys ($M = 5.45, SD = 2.14$) than Democrats ($M = 4.98, SD = 2.33$), $F(1, 591) = 4.99, p = .026, \eta_p^2 = .01$.

Measures

At every time point, participants responded to measures in the following categories: belief in climate change; beliefs about causes of climate change; confidence in climate change beliefs; perceived harm from climate change; personal relevance of climate change; personal and political efficacy; frequency of pro-environmental behaviors; endorsement of climate change policies; trust in media and science; environmental identity; perceptions of local and national weather events; awareness of and belief in climate change's contribution to current national severe weather events (Times 2-7 only); assessments of whether their beliefs had changed since previous surveys (Times 2-7 only); and demographic variables. Variables discussed in the present paper are detailed below.

Climate change belief. Participants answered on a 7-point scale (1 *definitely not happening* – 7 *definitely happening*), “Regardless of the cause, to what extent do you believe climate change is happening?” (adapted from Myers, Maibach, Roser-Renouf, Akerlof, & Leiserowitz, 2013).

Climate change causes. Participants indicated the extent to which they believed climate change was caused by (a) human activities and (b) natural causes, and both items used a scale ranging from 1 (*not at all*) to 7 (*very much*; adapted from Leiserowitz, Maibach, & Roser-Renouf, 2010).

Weather information sources. In free responses, participants were asked to indicate how many times they had sought out information about (a) local weather and (b) national weather in the last week. And, using a check-all-that-apply response option, participants indicated which of the following sources of weather information they had accessed in the last week: (a) smartphone weather apps; (b) weather websites; (c) print newspaper weather forecasts; (d) Weather Channel; and (e) local news TV weather coverage.

Local weather perceptions. In response to the question, “Lately, how has the weather been in the area where you live?”, participants used 7-point bipolar scales to indicate whether their local weather was *worse than usual* (1) or *better than usual* (7), and if the weather was *unusual* (1) or *typical* (7) (adapted from Leiserowitz et al., 2010).

Frequency of unusual weather events. To assess participants’ perceptions of the frequency of unusual weather events, participants responded to the question, “To what extent are the following events occurring more often?” Using a 7-point scale ranging from *Not at all (same frequency as usual)* (1) to *Very much (occurring much more frequently)* (7), participants evaluated the following unusual weather events (adapted from Leiserowitz et al., 2010): a

rainstorm that lasts for 7 days; a tropical storm; a category 5 hurricane; a drought that lasts a year; below average temperatures that last two weeks; a deep freeze that lasts 7 days; above average temperatures that last two weeks; and, a heat wave that lasts 7 days.

National extreme weather events. At Times 2-7, participants were asked about a series of extreme weather events that had occurred somewhere in the U.S. during the prior eight weeks (i.e., since the previous survey). On 7-point scales ranging from *Not at all* (1) to *Very much* (7) for each weather event, participants were asked to indicate (a) their awareness of the event and (b) their belief that climate change had contributed to the event. The events at each time point were as follows:

Time 2. Drought in the West, the “polar plunge” in the Midwest, Hurricane Arthur on the East Coast, wildfires in Washington state, Hurricane Karina in Hawaii, tornadoes in Kansas, and an earthquake in Northern California.

Time 3. Drought in the West, and record-breaking summer heat across the U.S.

Time 4. Rainstorms and mudslides in Northern California, a blizzard in Buffalo, NY, and an abnormally low number of tornadoes in the Midwest.

Time 5. Snowstorms in New England, record low temperatures across the Midwest and East Coast, snow and ice storms in the South, and the drought in the West.

Time 6. An earthquake in Michigan, snow in April in the Midwest and Northeast, and the drought in the West.

Time 7. Flash floods in the South, tornadoes in the Midwest, drought in the West, and wildfires in the West.

Statewide temperature deviations. Using data collected from the National Oceanic and Atmospheric Association’s National Climatic Data Center (2017), combined with each

participant's state of residence (as provided at Time 1), statewide average temperature data were collected for each state², at each time point, for two periods of time: first, for the month during which the survey took place at each time point (e.g., July 2014 for Time 1 in Alabama); and second, for the historical average for that month over the 30 years prior to that time point (e.g., average temperature in July from 1984-2013 in Alabama). A deviation score for each state at each of the seven time points was computed by subtracting the 30-year historical average from the average temperature during the month in which the survey was administered.

Local severe weather. Using the National Oceanic and Atmospheric Association's Storm Events Database (2015), combined with each participant's ZIP code at each time point, local severe weather data were collected for the 60 days prior to each survey's administration. Events in this database include storms that may cause disruption or loss of life to an area, rare weather phenomena, or other significant meteorological events; the types of events recorded in this study included high winds, flash floods, rip currents, and blizzards, among others. For each participant at each time point, severe weather events were recorded within this 60-day span in terms of their type, the number of isolated events, and the number of days with such events.

Demographics. In addition to reporting their home ZIP code, age, gender identity, and racial identification, participants at all time points reported the following demographic measures: education (7 options ranging from *less than 9th grade* to *graduate or professional degree*); annual household income (6 options ranging from *less than \$20,000* to *\$250,000 or more*); political liberalism (1 *not at all liberal* to 7 *very liberal*); political conservatism (1 *not at all conservative* to 7 *very conservative*); major political party affiliation (Republican or Democrat);

² Excluding Alaska and Hawaii, which were not included in the database.

religiosity (6 options ranging from *very religious* to *anti-religious*); and spirituality (5 options ranging from *very spiritual* to *anti-spiritual*).

Results

Analytic strategy

The driving question of the present study is: Which participants paid attention to various types of climate and weather information, and did this attention differ by time or seasons throughout the yearlong study? To address this question, this section will first describe the nature of the participant sample in terms of their beliefs about climate change and its causes. Next, analyses will be divided into two sections. In the first section, results will cover the relation between climate change belief and subjective perceptions of weather and weather-related information consumption, including: types of weather information consumed; perceived frequency of unusual weather events; perceptions of local weather; and awareness of and belief about climate change's contribution to national extreme weather events. In the second section, results will cover the relation between climate change belief and more objective measures of weather variations, including: statewide temperature deviations for the month in which each time point occurred; and local occurrences of extreme weather events in the time around each survey's administration.

Climate change belief

Throughout the study, belief in the existence of climate change—regardless of its cause—was generally high: Mean levels of agreement that climate change existed were well above the scale midpoint at each time point (T1: $M = 6.03$, $SD = 1.35$; T2: $M = 5.97$, $SD = 1.45$; T3: $M = 5.86$, $SD = 1.51$; T4: $M = 5.75$, $SD = 1.55$; T6: $M = 5.84$, $SD = 1.62$; T7: $M = 5.92$, $SD = 1.63$). Repeated-measures ANOVA with belief in climate change as a within-subjects factor

indicated both a significant linear effect (belief in climate change decreased throughout the study; $F(1, 291) = 4.10, p = .044, \eta_p^2 = .014$) and a significant quadratic effect (belief in climate change was highest during warmer months and lowest during colder months; $F(1, 291) = 23.03, p < .001, \eta_p^2 = .073$). See Figure 1.

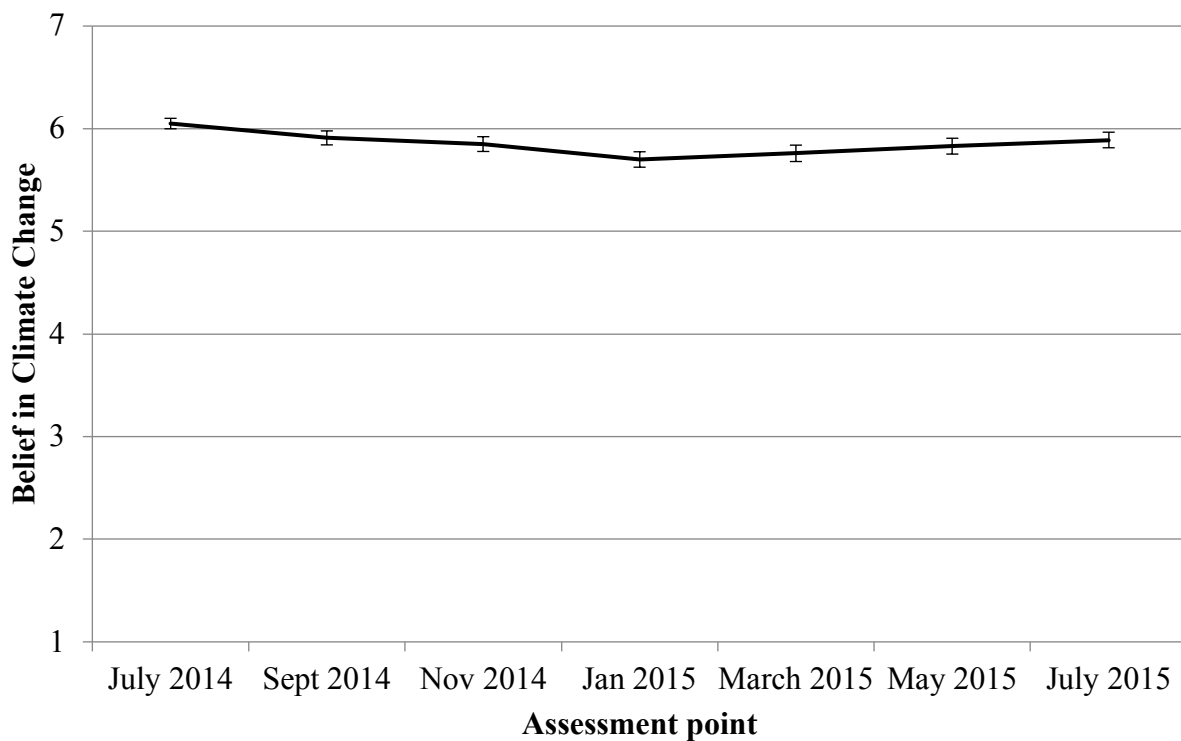


Figure 1. Belief in climate change at each of the seven time points of the study. Higher numbers on the y-axis indicate greater belief in the existence of climate change, regardless of the cause.

Climate change causes

Belief in climate change was consistently associated with believing that climate change was caused by humans (i.e., anthropogenic), rather than by natural causes. At every time point, linear regressions indicated that belief in climate change at that time point was significantly predicted by the belief that climate change had human causes. Conversely, climate change belief at each time point was significantly and negatively related to belief that climate change was due

to natural causes. See Table 2 for statistical details. Repeated-measures ANOVA found a significant quadratic effect for believing that climate change had human causes ($F(1, 291) = 19.60, p < .001, \eta_p^2 = .063$), although no linear effect ($F(1, 291) = 0.02, p = .888, \eta_p^2 = .00$), indicating that belief in anthropogenic causes peaked during warmer months, much like general belief in the existence of climate change. However, for natural causes of climate change, there was no quadratic effect ($F(1, 291) = 0.21, p = .648, \eta_p^2 = .00$), but there was a marginal linear effect ($F(1, 291) = 3.58, p = .060, \eta_p^2 = .012$), indicating that belief in natural climate change causes declined somewhat throughout the study.

Table 2

Effect of Perceived Causes of Climate Change on Belief in Climate Change

Predictor	Time point	<i>b</i>	<i>SE b</i>	<i>t</i>	R^2_{change}	<i>p</i>
Human cause	Time 1	0.50	0.03	18.34	.36	< .001
	Time 2	0.60	0.03	18.21	.44	< .001
	Time 3	0.63	0.04	18.13	.44	< .001
	Time 4	0.71	0.03	22.42	.55	< .001
	Time 5	0.71	0.03	21.33	.54	< .001
	Time 6	0.69	0.03	22.02	.54	< .001
	Time 7	0.73	0.03	23.63	.58	< .001
Natural cause	Time 1	-0.26	0.03	-8.51	.11	< .001
	Time 2	-0.32	0.04	-7.78	.12	< .001
	Time 3	-0.33	0.04	-7.71	.13	< .001
	Time 4	-0.41	0.05	-9.04	.17	< .001
	Time 5	-0.39	0.05	-8.77	.16	< .001
	Time 6	-0.42	0.04	-9.86	.19	< .001
	Time 7	-0.37	0.04	-8.48	.15	< .001

Note. Table depicts results of linear regressions of perceived human (top panel) and natural (bottom panel) causes of climate change on overall belief in existence of climate change. Higher values indicate greater agreement that climate change is driven by that factor. Beta coefficients represent unstandardized values. Degrees of freedom varied between time points due to inconsistent participation rates; values ranged from 598 (Time 1) to 394 (Time 5).

Subjective information consumption and weather perceptions

In this section, analyses will address whether participants at different levels of belief in climate change differed in the type of weather information they consumed, as well as whether they displayed dissimilar perceptions of local and national weather. These analyses can assess whether differences in climate change beliefs can be attributed to: different weather media environments; or different perceptions of local and national weather.

Weather information sources. At each time point, participants were asked to report approximately how many times in the past week they had sought out information about weather on two levels: local and national. For local weather information, linear regressions found no associations with concurrent belief in climate change for any time point (all $ps > .54$). For national weather information, the story was largely the same for Times 1-6 (all $ps > .07$); however, at Time 7, climate change belief at that time significantly predicted seeking out more national weather information ($B = 0.21$, $SE = 0.08$, $t(412) = 2.63$, $p = .009$, $R^2_{change} = .02$).

Multiple regressions analyses with each time point's climate change belief as the outcome and the five sources of weather media (smartphone, weather website, print news, Weather Channel, or local news) as predictors generally found no differences at any time point. The only exceptions were for the use of weather websites: at both Time 4 ($B = 0.36$, $SE = 0.17$, $t(404) = 2.11$, $p = .036$, $sr^2 = .01$) and Time 7 ($B = 0.39$, $SE = 0.18$, $t(409) = 2.19$, $p = .029$, $sr^2 = .01$), greater use of weather websites as a weather source predicted increased belief in climate change.

Local weather perceptions. At every time point, participants were asked to consider how their local weather had been lately on two dimensions: whether it had been better or worse than usual, and whether it had been typical or unusual. First, linear regressions consistently

found that belief in climate change at each time point significantly predicted—although the effect is marginal at Time 4—perceiving one’s local weather as being worse than usual (vs. better) lately. Additionally, climate change belief at each time point significantly predicted perceiving one’s local weather as having been unusual (vs. typical) lately. See Table 3 for statistical details.

Table 3
Effect of Belief in Climate Change on Local Weather Perceptions

Outcome	Time point	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>R</i> ² _{change}	<i>p</i>
Lately, worse or better than usual	Time 1	-0.18	0.04	-4.27	.03	< .001
	Time 2	-0.17	0.04	-4.07	.04	< .001
	Time 3	-0.08	0.04	-2.09	.01	.037
	Time 4	-0.08	0.04	-1.80	.01	.073
	Time 5	-0.10	0.05	-2.18	.01	.030
	Time 6	-0.11	0.04	-2.91	.02	.004
	Time 7	-0.19	0.04	-4.33	.04	< .001
Lately, unusual or typical	Time 1	-0.27	0.06	-4.92	.04	< .001
	Time 2	-0.28	0.06	-4.92	.05	< .001
	Time 3	-0.28	0.06	-5.09	.06	< .001
	Time 4	-0.34	0.06	-6.12	.08	< .001
	Time 5	-0.26	0.06	-4.67	.05	< .001
	Time 6	-0.27	0.05	-5.03	.06	< .001
	Time 7	-0.44	0.06	-7.80	.13	< .001

Note. Table depicts results of linear regressions of overall belief in climate change on whether one’s local weather has been worse or better lately (top panel) and whether it has been unusual or typical (bottom panel). Higher values indicate better and more typical weather, respectively. Beta coefficients represent unstandardized values. Degrees of freedom varied between time points due to inconsistent participation rates; values ranged from 598 (Time 1) to 394 (Time 5).

Frequency of unusual weather events. At every time point, participants recorded their perceptions of the frequency of unusual weather events occurring (the precise setting of these occurrences was not specified). Due to consistently high internal reliability ($\alpha_{T1} = .92$; $\alpha_{T2} = .92$; $\alpha_{T3} = .94$; $\alpha_{T4} = .94$; $\alpha_{T5} = .94$; $\alpha_{T6} = .95$; $\alpha_{T7} = .95$), these eight weather events were collapsed

into a single composite mean for each time point. (Although these weather events differed in terms of their association with warmer or colder weather, reliability estimates and correlations indicated that participants' responses did not differ between warm- or cold-weather events in these measures.) Linear regressions indicated that greater belief in climate change at each time point consistently predicted the perception that these weather events were occurring with greater frequency. See Table 4 for statistical details.

Table 4

Effect of Belief in Climate Change on Perceived Frequency of Unusual Weather Events

Time point	<i>b</i>	<i>SE b</i>	<i>t</i>	R^2_{change}	<i>p</i>
Time 1	0.51	0.04	11.69	.19	< .001
Time 2	0.50	0.05	10.61	.21	< .001
Time 3	0.56	0.05	12.05	.26	< .001
Time 4	0.58	0.04	13.13	.30	< .001
Time 5	0.52	0.05	11.42	.25	< .001
Time 6	0.65	0.04	14.92	.35	< .001
Time 7	0.64	0.05	14.11	.33	< .001

Note. Table depicts results of linear regressions of overall belief in climate change on whether various unusual weather events (mean composite) have been occurring less (1) or more (7) frequently than usual. Beta coefficients represent unstandardized values. Degrees of freedom varied between time points due to inconsistent participation rates; values ranged from 598 (Time 1) to 394 (Time 5).

National extreme weather events. From Times 2-7, participants were asked questions about a series of national extreme weather events that had occurred in the eight weeks since the previous survey in the study. These weather events varied, but for each one, participants recorded their awareness of the event, as well as their belief that climate change contributed to the event. For ease of analysis, ratings of both awareness and climate change contribution to the events were each collapsed into composite means at each time point (awareness: $\alpha_{T2} = .79$; $r_{T3} = .57$; $\alpha_{T4} = .66$; $\alpha_{T5} = .62$; $\alpha_{T6} = .49$; $\alpha_{T7} = .74$; climate change contribution: $\alpha_{T2} = .93$; $r_{T3} = .86$; $\alpha_{T4} = .89$; $\alpha_{T5} = .96$; $\alpha_{T6} = .79$; $\alpha_{T7} = .92$). Linear regressions indicated that, with the exception

of Time 2³, belief in climate change at each time point significantly predicted greater awareness of national extreme weather events. Linear regressions also found that, again with the exception of Time 2, belief in climate change at each time point significantly predicted the belief that climate change was contributing to the occurrence of the extreme weather event. See Table 5 for statistical details.

Table 5

Effect of Belief in Climate Change on Perceptions of National Extreme Weather Events

Outcome	Time point	<i>b</i>	<i>SE b</i>	<i>t</i>	<i>R</i> ² _{change}	<i>p</i>
Awareness	Time 2	-0.05	0.05	-1.08	.00	.281
	Time 3	0.38	0.06	6.74	.10	< .001
	Time 4	0.17	0.05	3.20	.02	.001
	Time 5	0.16	0.04	4.00	.04	< .001
	Time 6	0.16	0.05	3.22	.03	.001
	Time 7	0.25	0.05	5.21	.06	< .001
	Belief in climate change's contribution	Time 2	-0.08	0.06	-1.51	.01
Time 3		0.85	0.04	21.16	.52	< .001
Time 4		0.71	0.05	15.88	.38	< .001
Time 5		0.79	0.04	17.76	.45	< .001
Time 6		0.73	0.04	18.66	.46	.001
Time 7		0.81	0.04	19.64	.48	< .001

Note. Table depicts results of linear regressions of overall belief in climate change on awareness of (top panel) and belief in climate change's contribution to (bottom panel) a variety of recent, extreme weather events that had occurred in the U.S. Higher values indicate greater awareness of the event and belief in climate change's contribution to the event, respectively. Beta coefficients represent unstandardized values. Degrees of freedom varied between time points due to inconsistent participation rates; values ranged from 598 (Time 1) to 394 (Time 5).

To address whether participants' awareness of or belief in climate change's contribution to national weather events varied by the warm- or cold-weather-related nature of the event, awareness and climate change contribution measures were also combined into warm- and cold-

³ I do not have a great explanation for why Time 2 did not show the same effects as Times 3-7 on these measures.

weather composites for alternative analyses. The internal reliabilities of all awareness items at each time point were often quite low, indicating that participants may have differentiated in these responses between warm- and cold-weather events. Therefore, all warm-weather national extreme weather events (droughts, hurricanes, heat spells, and wildfires; 10 total)⁴ were collapsed into a composite means across time points (awareness $\alpha = .74$; climate change contribution $\alpha = .82$), and the same was done for all cold-weather events (extreme low temperatures, rainstorms, blizzards/snowstorms, snow in April, and flash floods; eight total; awareness $\alpha = .72$; climate change contribution $\alpha = .91$). Using Time 1 belief in climate change as a predictor⁵, linear regressions found that climate change belief significantly predicted awareness of both warm-weather ($B = 0.18$, $SE = 0.05$, $t(298) = 3.88$, $p < .001$, $R^2_{change} = .05$) and cold-weather ($B = 0.14$, $SE = 0.05$, $t(299) = 2.68$, $p = .008$, $R^2_{change} = .02$) national extreme events, as well as greater belief in climate change's contribution to warm-weather ($B = 0.44$, $SE = 0.05$, $t(299) = 9.41$, $p < .001$, $R^2_{change} = .23$) and cold-weather ($B = 0.64$, $SE = 0.06$, $t(301) = 11.03$, $p < .001$, $R^2_{change} = .29$) events. With these analyses, it is notable that although greater belief in climate change was positively associated with both warm- and cold-weather extreme events, the effects for both awareness and climate change contribution were greater for warm-weather events, indicating that those who endorsed climate change were especially attuned to warm-weather extreme events.

⁴ Although hurricanes are usually manifested by rainstorms, they come from warm weather systems, and were thus included in this warm weather composite. A composite without hurricanes had similar levels of internal reliability (awareness $\alpha = .76$; climate change contribution $\alpha = .84$). Therefore, the “hurricanes” version of this composite was used for the present analyses.

⁵ The patterns of results did not change when using the climate change belief measure from any other time point as a predictor.

There were five other national events that did not neatly fall into warm- or cold-weather categories, either because they were somewhat ambiguous in these terms (e.g., hurricanes) or because they are not related to climate change (e.g., earthquakes). At Time 2, in judgments of both tornadoes in Kansas and an earthquake in California, climate change belief was unrelated to measures of awareness of ($p = .335$ and $p = .860$, respectively) or climate change's contribution to the events ($p = .591$, and $p = .604$, respectively.) At Time 4, climate change belief was unrelated to awareness of a record low number of tornadoes in the country ($p = .157$), but it did predict believing that climate change had contributed to the event ($B = 0.62$, $SE = 0.05$, $t(408) = 12.03$, $p < .001$, $R^2_{change} = .26$). At Time 6, climate change belief had no relation to awareness of an earthquake in Michigan ($p = .999$), but did predict the perception that climate change influenced the event ($B = 0.34$, $SE = 0.06$, $t(408) = 5.94$, $p < .001$, $R^2_{change} = .08$). Lastly, for tornadoes in the Midwest at Time 7, belief in climate change predicted both greater awareness of ($B = 0.20$, $SE = 0.07$, $t(413) = 3.07$, $p = .002$, $R^2_{change} = .02$) and belief in climate change's contribution to ($B = 0.73$, $SE = 0.05$, $t(413) = 13.62$, $p < .001$, $R^2_{change} = .31$) the event.

Interim summary

Thus far, climate change belief at each time point is consistently associated with a number of perceptions of the weather, both local and national. First, belief in the existence of climate change among the sample was relatively high, and it was consistently associated with believing that anthropogenic (vs. natural) reasons caused climate change. Although there were almost no associations between climate change belief and the type of weather information sought, belief in climate change was consistently associated with: perceiving that one's local weather had recently been worse and more unusual than normal; perceiving that unusual weather events, such as droughts or powerful rainstorms, were growing more frequent; increased

awareness of newsworthy, extreme weather events that had taken place around the U.S. in recent months; increased belief that climate change contributed to the occurrence of these national extreme weather events; and that awareness and belief in climate change's contribution to severe weather events occurred similarly for both warm- and cold-weather events.

However, do more objective measures of temperature variation and occurrences of severe weather events align with these perceptions, particularly at the local level? In other words, when participants who believe in climate change perceive that their local weather environments are more unusual and see climate change's contribution to severe weather events, are their perceptions accurate? The following analyses can address whether climate change believers (vs. skeptics) may be informing their climate beliefs by observing the weather around them, or whether their beliefs are merely guiding their perceptions of weather and climate patterns.

Objective weather variations

Statewide temperature deviations. Before analyses, data were prepared in two forms: the raw difference score between the average temperature for the month of the time point and the 30-year average (i.e., either positive or negative), as well as the absolute difference of that score (i.e., only positive). At each time point, four types of linear regressions were performed, each with that time point's belief in climate change as the outcome, and the different predictors were: (a) the raw temperature difference for that month; (b) the absolute value temperature difference for that month; (c) the raw temperature difference for the previous time point (Times 2-7 only); and (d) the absolute value temperature difference for the previous time point (Times 2-7 only).

Of these analyses, only one found a significant association with belief in climate change during that time point: The raw temperature deviation for Time 6 had a significant, positive association with Time 6 climate change belief, indicating that belief was associated with

temperatures that were warmer than the historical average for that month ($B = 0.06$, $SE = 0.03$, $t(403) = 2.11$, $p = .036$, $R^2_{change} = .01$). Otherwise, no other analyses reached statistical significance (all $ps > .050$).

Local severe weather. At each time point, two linear regressions were performed, each with that time point's climate change belief as the outcome, and two predictors: (a) the number of severe weather events that had occurred in the participant's locale (determined by ZIP code) in the prior 60 days; and (b) the number of days (out of those 60) in which severe weather events had occurred. However, at every time point there were no statistically significant associations between either of these predictors and climate change belief (all $ps > .130$).

Discussion

The present research addressed whether climate change believers and skeptics differ in two ways. First, do people with differing climate beliefs exist in different information environments, both in terms of climate-relevant media consumption and objective weather, such as temperature and extreme weather events? And second, do people with differing climate beliefs perceive their weather and climate environments differently? Although past research has previously addressed some pieces of these questions, the present research did so using data from a longitudinal dataset of 600 American adults, which featured high retention, strong geographic representativeness, and more assessment points (seven) than other comparable longitudinal research that the author is aware of. Moreover, this dataset included measures of information consumption, subjective weather and climate perceptions, and objective weather data to assess potential differences in weather exposure and perceptions. Analyses point to several preliminary conclusions and future directions for research.

Few Differences in Information Environments

Most of the participants in the present research believed that climate change existed—at most time points, climate change belief approached 6.0 on a 7-point scale of agreement—and general belief in climate change was closely related to perceiving humans as a major causal factor, rather than natural causes. Although most of the sample endorsed the existence of climate change, there was variation in climate change belief among the sample, and it is possible that this variation could be explained by differences in weather-related information environments. In particular, these differences could come in two forms: variation in the extent or type of weather information consumed, or variation in the actual weather experienced in one’s local area.

However, analyses found little support that either of these potential information environment differences existed at all amidst the sample’s participants. With regards to weather-related information seeking, there were generally no differences by climate change belief. Despite a couple of small but inconsistent effects over the course of the study, there were hardly any differences in local versus national weather information consumption, or consumption of weather information by media source. Similarly, people who differed in their climate change beliefs generally did not differ in terms of their experiences of statewide temperature deviations (NOAA National Climatic Data Center, 2017) or local occurrences of severe weather events (NOAA National Centers for Environmental Information, 2015) during each assessment point of the study. Thus, differences in participants’ beliefs in climate change in the present study could not be explained by: (a) distinct patterns of seeking out weather-related information in terms of its scope (local vs. national) or media source; or (b) distinct experiences of weather and climate patterns in more localized areas. In the present study, climate change believers and skeptics did not seem to be exposed to significantly different information about the weather and climate.

Significant Perceptual Differences

However, climate change beliefs were consistently related to a variety of perceptual differences about local and national weather patterns. At every single time point, climate change belief was significantly associated with: (a) seeing one's local weather as being worse than usual; (b) seeing one's local weather as being more unusual; and (c) believing that notable weather events—such as droughts, blizzards, or hot or cold spells—were occurring more frequently. And with regards to specific, extreme national weather events that occurred around the U.S. during the yearlong study, climate change believers were generally more likely to report being aware of the events and to believe that climate change was contributing to their occurrence. Moreover, climate change believers reported similar perceptions and beliefs about both hot- and cold-weather phenomena; unlike some prior research showing that only abnormally warm weather (e.g., Borick & Rabe, 2017) is associated with climate change beliefs, weather phenomena of all types were more salient to climate change believers in the present study.

Objective vs. Subjective Differences

Overall, results of the present study indicate a misalignment between objective and subjective sources of weather and climate information. Although climate change belief was consistently associated with believing that local weather was behaving more unusually and with greater awareness of and belief that climate change contributed to a variety of severe weather events, climate change believers and skeptics did not appear to be exposed to significantly different objective weather circumstances (e.g., temperature deviations or occurrence of severe weather events) throughout the study. If climate change beliefs had aligned consistently with both subjective weather perceptions and objective weather patterns, then that might present a simpler story: Those living in areas that are experiencing abnormal temperatures or frequent occurrences of severe weather events would be more likely to endorse climate change's

existence, whereas climate change skeptics would be less likely to believe in climate change due to their comparatively milder conditions. In this hypothetical world, beliefs, perceptions, and objective data would be in harmony. However, the present study indicates that the story is not so simple, and that instead climate change beliefs and weather perceptions are not consistently associated with actual deviations in weather patterns. This raises the question: Amongst climate change believers and skeptics, is one group more accurate in its perceptions than the other?

The question of accuracy is somewhat difficult to assess, but the present results suggest one of two possible answers. Climate change believers and skeptics may not be experiencing different temperature or extreme weather variations, but it is conceivable that: (a) temperatures and severe weather *were* historically unusual across the country throughout the yearlong study, making the believers' perceptions more "correct"; or (b) temperatures and severe weather *were not* historically unusual across the country throughout the study, lending credence to the skeptics' perceptions. Nationwide climate reports from each month of the study (NOAA National Centers for Environmental Information, 2015) suggest that the answer is mixed: Sometimes the believers were more accurate, sometimes the skeptics were more accurate, and all participants probably used their climate change beliefs to overgeneralize their perceptions about the weather. According to these nationwide climate reports, the months for Times 1 (July 2014, 6 (May 2015), and 7 (July 2015) were not notably different from their 120-year averages, indicating that for these months, the climate change skeptics may have been more accurate in their perceptions that the local weather had been more typical. However, Times 2 (September 2014), 4 (January 2015), and 5 (March 2015) were all ranked in the warmest quartile (30th warmest or higher in 120-year record) for that month, and each had been warmer than years in recent memory. And Time 3 (November 2014) was both the 16th coldest November in 120 years

and the coldest November since 2000, making it a historical and recent outlier. Thus, for these time points, the climate change believers may have been more accurate in perceiving that the local weather had been more unusual recently. Overall, these comparisons indicate that climate change believers and skeptics were alternately accurate or inaccurate in their perceptions of unusual or typical weather, and that perhaps they had a tendency to base their weather perceptions on their beliefs about climate change.

Future Directions and Limitations

The present study found that rather than using objective weather and climate patterns to form beliefs about climate change, participants seemed to generally perceive local and national weather patterns in line with their beliefs about whether climate change was occurring. Moreover, there was little evidence that climate change believers and skeptics engage in different acquisition processes for weather information or exist in weather environments that provide differing evidence in favor of (or against) the existence of climate change. Although these findings are consistent with accounts of motivated reasoning with climate change beliefs (e.g., Myers et al., 2013), there are several avenues of for future research to explore, as well as some notable limitations of the present research.

First, future research should more thoroughly explore the question of whether climate change beliefs are related to different climate-relevant media environments. When the present study was designed, exploring media consumption about climate change was not a primary goal, but this question arose when prior research using this dataset (Hall, Lewis, & Ellsworth, 2018) could not identify many factors that contributed to different beliefs about climate change. Thus, there are few measures of climate-relevant media consumption in the present study, and they are not as specific as would be ideal to study questions about different information environments.

However, past research has documented differential media consumption patterns relative to belief in climate change (Brulle et al., 2012; Feldman et al., 2012; Hmielowski, 2014) and political ideology (Hart et al., 2015). And although the present study did not find differences in local or national weather media use or in weather sources, Prior (2009) has found that self-reported media usage is subject to considerable error. Therefore, future research should further explore with greater precision whether climate change beliefs are influenced by intake of local versus national weather coverage. Because climate change is often thought to be occurring broadly but not locally (Gifford et al. 2009), perhaps exposure to weather information outside of one's locale could influence beliefs about climate change.

Another area for future exploration is the effect of severe weather events on climate change beliefs and perceptions. The present study found no effects of the local occurrence of severe weather events on climate change beliefs, which is consistent with some past studies (e.g., Carlton et al., 2016) but not with others (e.g., Shao, 2016). Therefore, the effects of experience and frequency of local severe weather events on climate change beliefs remain unclear.

A final limitation of the present study concerns the participant sample, which was drawn from Amazon Mechanical Turk. Although the sample was highly representative of the geographic and urban/rural distribution of the U.S., it was not as representative of the U.S. on several demographic metrics, including age, race, income, education, and political ideology (although see Clifford, Jewell, & Waggoner, 2015, for a discussion of why MTurk is still suitable for political research). Therefore, it is likely that the present sample does not capture sufficient variance in beliefs and perceptions of climate change. The average belief about climate change's existence in this study was quite high (whereas surveys consistently show more mixed levels of belief; e.g., Leiserowitz et al., 2012), and political leanings did not predict belief in

climate change (as explored in Hall et al., 2018), a finding at odds with much other research on climate change beliefs (e.g., Hornsey et al., 2016). Thus, further exploration of the present questions should strive for a more representative sample. In particular, it would be desirable to include more participants who feel strongly about the issue but believe that climate change is, at best, an open question, and at worst, a hoax.

Conclusion

The present study sought to address whether differing levels of belief in climate change could be explained by exposure to different climate-relevant information environments—weather media or objective weather conditions—or whether perceptions of weather patterns were largely driven by existing climate change beliefs. Results of the present study better supported the second explanation: Climate change believers and skeptics did not differ in their weather media environments or in their experiences of abnormal temperatures and severe weather events, but they did consistently differ in their perceptions of the weather and the contribution of climate change. Furthermore, it did not appear that one group was more accurate than the other, but rather that they used their climate change beliefs to guide their interpretations of the weather, both when the weather did and did not support their beliefs. Thus, the present study provides further evidence that climate change believers and skeptics are likely not forming climate change beliefs based on different objective circumstances, but rather that they perceive their circumstances in line with their preexisting beliefs.

CHAPTER III

Blinded by Liking: Selective Exposure Within Dyadic Relationships

Imagine that your friends, co-workers, and family worked on your behalf to make sure that you were only exposed to media that made you feel good about yourself. Wouldn't that be great? For President Trump, this fantasy is, to some extent, a reality. Reportedly, the President's staff members routinely direct his attention to media outlets issuing "a steady stream of praise" for him; when none such praise could be found, his staffers "would turn to friendly outlets to drum some up – and make sure it made its way to Trump's desk" (Palmeri, 2017). Because President Trump allegedly has a voracious appetite for media but does not react well to critical coverage, his staffers attempt to curate his media environment to include congenial (i.e., agreeable) information in order to "contain his Twitter-rage" (Palmeri, 2017).

Unlike Trump, most of us do not have staff members concerned with our personal media consumption and how it makes us feel. But, could there still be any truth to the idea that our friends and peers curate an information environment that is friendly to our views? If so, how would such curation affect how we evaluate congenial and uncongenial information? The current paper addresses these questions by examining how information is shared in relational dyads based on two factors: the congeniality (or agreeableness) of information to both the selector's and recipient's attitudes; and the feelings that the selector and recipient have about each other.

Selective Exposure for the Self and Others

For the self, it is well-established in psychological literature that people are more likely to see information that supports (vs. challenges) their desired conclusions (Brock & Balloun, 1967;

Earl, Albarracín, Durantini, Gunnoe, Leeper, & Levitt, 2009; Festinger, 1957; Hart et al., 2009; Freedman & Sears, 1965). Indeed, evidence suggests that people have a moderate preference for congenial (versus uncongenial) information (meta-analytic $d = 0.36$; Hart et al., 2009; see also Cotton, 1985; Frey, 1986). Historically, research has proposed two processes to support this selective exposure outcome: attitude selectivity and *de facto* selectivity.

According to attitude selectivity, people actively seek information that supports (vs. challenges) their views, more often choosing congenial over uncongenial information (Festinger, 1957; Frey, 1986; Hart et al., 2009). Attitude selectivity for the self has been demonstrated in a variety of contexts, including health messages about smoking (Brock & Balloun, 1967), messages about HIV-prevention behavior (Earl et al., 2009), and political issues (Lord, Ross, & Lepper, 1979). Attitude selectivity is generally considered to be driven by one of two motives: defense or accuracy motivations (Hart et al., 2009). Defense motivations are more likely when the information selector anticipates potential cognitive dissonance (e.g., when someone is strongly committed to an attitude, when it is identity-relevant), thereby leading the selector to exhibit a heightened preference for congenial (vs. uncongenial) information (Festinger, 1957; Hart et al., 2009). Defense motives spur selectors to choose information that should make them “*feel validated*,” leading to selections of high-quality congenial and low-quality uncongenial information (Hart et al., 2009, p. 555). Accuracy motivations, however, drive selectors to choose information that is high in utility regardless of congeniality, often leading to a reduced congeniality bias (Chaiken, Liberman, & Eagly, 1989; Hart et al., 2009). Accuracy motivations are more likely to motivate information selection when people have a desire to “*be correct*” and pursue objectively useful information (Hart et al., p. 555).

According to *de facto* selectivity, people simply exist in environments that present mostly congenial (vs. uncongenial) information (Freedman & Sears, 1965; Sears, 1968; Greenwald & Sakumura, 1967; Zajonc, 1965). It is unclear *how* a person becomes surrounded by mostly congenial information, but nonetheless, that person finds the majority of his or her information exposure to be congenial. However, *de facto* selectivity has received considerably less empirical attention, and its underlying processes are thereby unclear. Studying how information is shared and evaluated within relational dyads could illustrate not just whether *de facto* selectivity occurs, but also whether it is facilitated by close others' informational choices on our behalf.

Beyond the self, how do people choose information on behalf of others? One possibility is that people disregard the recipient's views and choose information that they personally prefer. When the topic elicits defensive motives for selectors, they may choose whatever suits their own views; this outcome simultaneously affirms one's views and avoids dissonance from propagating uncongenial information (Festinger, 1957; Hart et al., 2009). However, this view largely ignores the recipient's attitudes, and research suggests that there should be circumstances under which selectors are likely to take recipients' perspectives into account when selecting information on their behalf. For instance, people may choose to silence themselves rather than say something that would hurt another's feelings (Rosen & Tesser, 1970). In instances of group decision-making, people may suppress their own points of view in order to preserve group harmony, especially if their views might be uncongenial to other group members (Janis, 1972). Finally, when deciding whether or how to deliver bad news to someone, the information messenger may consider the recipient's preferences and feelings (Sweeny & Shepperd, 2007).

Accounting for an information recipient's attitudes or feelings should occur especially for liked others. People are more likely to experience the emotions of liked others (Hatfield,

Cacioppo, & Rapson, 1994; Heider, 1958; Howard & Gengler, 2001), experience vicarious distress from liked others' pain (Krebs, 1975), and experience vicarious dissonance with liked others (Norton, Monin, Cooper, & Hogg, 2003). Liked others are also more likely to be incorporated into one's self-concept when they are similar in personality (Smith & Henry, 1996) and attitudes (Coats, Smith, Claypool, & Banner, 2000). Thus, information selectors should produce more congenial information for recipients to promote validation and reduce the discomfort associated with uncongenial information. Even for attitudinally dissimilar others, an information recipient's likability may affect the congeniality of information selections.

Understanding selectors' intentions when choosing information for others is also of theoretical value. For the self, issues that are value-relevant for selectors are more likely to elicit defensive motives, thereby increasing both congeniality bias and the need for validation; topics that are less value-relevant should elicit accuracy motives, thereby decreasing congeniality bias and increasing the need for useful information (Hart et al., 2009). How do these intentions manifest when selecting information for others? Issues eliciting defensive motives for the selector may lead to a congeniality bias for attitudinally similar recipients out of a desire to provide the same hedonic validation that the selector feels, but attitudinally dissimilar others may receive mostly uncongenial information (for them) out of the selector's attempt to persuade them (i.e., a motive to provide information that is useful, not hedonic, for the recipient).

Homogeneous vs. Heterogeneous Information Environments

Beyond questions of how people select information for others, the present research can also address: (a) the heterogeneity or homogeneity of information environments that selectors promote for recipients; (b) how recipients evaluate information as a result of characteristics of the selector and the selected information; and (c) whether recipients can identify the

homogeneity or heterogeneity of their information environments. These questions are especially relevant in the modern age of increased news consumption in online settings (Olmstead, Mitchell, & Rosenstiel, 2011), which may change how information is received and processed (Flanagin, 2017). Although there have been warnings that online platforms such as social media promote “echo chambers” that facilitate exposure to homogeneous and agreeable information (Bennett & Iyengar, 2008; Pariser, 2011; Stroud, 2008; Sunstein, 2001), research is divided about this possibility. Some suggest that these fears may be exaggerated (Bakshy, Messing, & Adamic, 2015; Diehl, Weeks, & Gil de Zúñiga, 2016; Nelson & Webster, 2017; Weeks et al., 2016), and others suggest that online environments may actually promote more heterogeneous information exposure (Barberá, 2015; Barberá, Jost, Nagler, Tucker, & Bonneau, 2015; Messing & Westwood, 2014).

Nonetheless, because online information transmission often relies upon the behavior of people in social networks, these social connections influence how news is consumed. Social media connections can facilitate diverse political discussions and persuasion to alternative viewpoints (Diehl et al., 2016; Heatherly, Lu, & Lee, 2017). Highly active online users can wield a wide influence within their social networks (Weeks, Ardèvol-Abreu, & Gil de Zúñiga, 2017), and news content that was received via a friendly connection is more likely to be further disseminated by the recipient (Weeks & Holbert, 2013). Finally, endorsements by friends on online social media platforms can promote selection of ideologically disagreeable information and reduce partisan selective exposure (Messing & Westwood, 2014), suggesting that interpersonal views of information transmitters (i.e., selectors) can overcome recipients’ biases about the content. Thus, studying the experience of information recipients can shed light on how selector likability and information congeniality affect information reception.

Current Studies

The present research addresses how people select information for others and how recipients evaluate that information across four studies. Specifically, the present research addresses these questions with attention to the influences of likability within the selector-recipient dyad and congeniality of the selected or received information. First, Studies 1 and 2 focus on information selectors and how their selection decisions are influenced by the recipient's likability. Study 1 examines information selection for a novel issue (i.e., selector has no attitude), whereas Study 2 examines selection for a familiar issue (i.e., selector has an attitude). Then, Studies 3 and 4 examine information recipients as a function of the selector's likability and the congeniality of the received information. In doing so, Studies 3 and 4 assess recipients' perceptions of informational bias and the factors that influenced their information environment.

Study 1

The goal of Study 1 was to assess how people make informational choices for other people. Specifically, Study 1 examined how informational choices varied by the information recipient's likability and stance on the issue at hand. In Study 1, all participants were selectors and were tasked with choosing information for alleged recipients about a fictitious intelligence test—the “MEQ”—to assess how such information selection for others occurs with a novel issue (i.e., one that participants did not have a preexisting attitude about).

Method

Participants. One hundred seventy-five American adults were recruited through Amazon Mechanical Turk (MTurk) for \$1.00. Participants were screened using two criteria: (1) if they indicated that their data was not of high quality ($n = 2$); and (2) if they failed an attention check that read, “If you are reading this question, please leave it blank” ($n = 19$). The final sample

consisted of the remaining 154 participants (55.2% female; 76.6% non-Hispanic White; $M_{age} = 37.77$ years, $SD = 12.17$ years).

Design. Study 1 had a between-subject design with two independent variables. The first, likability of the participant's fictitious partner (i.e., the alleged information recipient), had two levels: (a) likable partner, whose responses to questions about themselves indicated that they valued time with family and friends, were passionate about life, and that they took pride in being an honest, hardworking MTurk worker; or (b) unlikable partner, whose responses to questions about themselves indicated that they were uninterested in other people, enjoyed manipulating other people, and took pride in being a deceitful, dishonest MTurk worker motivated by money. The second independent variable, the fictitious partner's perception of the fictitious MEQ intelligence test, also had two levels: (a) valid, with the partner indicating that they had done well on the test and considered it a "good and genuine measure of my intelligence"; or (b) invalid, with the partner indicating that they had done poorly on the test and that it was "complete garbage" and "not a good test." Study 1 had a 2 (partner likability: likable or unlikable) x 2 (partner's perception of MEQ: valid or invalid) design. See the Appendix for full descriptions of both manipulations.

Procedure. Participants were told that the purpose of Study 1 was to test the use of "a quick, easy-to-administer type of intelligence test." Participants were informed that some other participants had already taken the test and would be returning for another study session in which they would read articles about the test that had been selected for them; the researchers were interested in transmitting this information electronically and were asking participants to select test-relevant information for the other participants in order to "remove the role of the

experimenter in assigning these articles.” Participants were also informed that the identities of themselves and their partner would remain anonymous.

Next, participants completed questions about themselves for their partner to read when the partner received the articles that the participant had selected for them. Participants were also told that they would have access to their partner’s responses to these same questions after providing their responses. Participants answered seven questions about: (1) gender; (2) occupation; (3) favorite color; (4) hobbies or leisure activities; (5) one unique trait they have; (6) personal values; and (7) what they enjoy about being a Mechanical Turk worker. After answering these questions, participants saw their alleged partner’s responses, which were randomly assigned to be likable or unlikable. Participants were then told that they were in the information selection phase of the study and that they could read their alleged partner’s impression of the test before selecting articles for them. Participants were then randomly assigned to view a response from a partner who viewed the test as either valid or invalid.

Lastly, participants selected articles about the test for their partner, evaluated their partner and the selected articles, and completed demographic measures.

Measures.

Article selection. Participants saw the thesis statements of eight articles about the MEQ test; four statements supported the MEQ’s validity, and four opposed its validity. Each statement conveyed whether the article supported or opposed the test’s validity as a measure of intelligence. For each of the eight articles, participants had a binary choice of selecting, “Yes, send to my partner” or “No, do not send to my partner.” Participants could send between zero and eight articles.

Hedonic experience. In response to the question, “When thinking about the article(s) you selected, how much would your partner...” participants used a 7-point scale (1 *not at all* – 7 *extremely*) to rate how much their partner would: (a) want to read the article(s); (b) agree with the article(s); (c) enjoy the article(s); (d) feel annoyed by the article(s); and (e) dislike the article(s). Items (d) and (e) were reverse-coded, and a composite mean of these five measures was constructed due to high internal reliability (Cronbach’s $\alpha = .92$).

Utility. In response to the prompt, “When thinking about the article(s) you selected...” participants used a 7-point scale (1 *not at all* – 7 *extremely*) to rate: (a) how much the selected article(s) would inform their partner about the MEQ; (b) how much knowledge about the MEQ their partner would gain by reading the article(s); and how much their partner would perceive the articles as (c) reliable, (d) valid, and (e) credible. A composite mean of these five measures was constructed due to high internal reliability ($\alpha = .91$).

Evaluations of partner. Using a 5-point scale (1 *not at all* – 5 *extremely*) participants evaluated their alleged partner on seven dimensions: (a) hardworking; (b) warm; (c) lazy; (d) likable; (e) cold; (f) overall impression; and (g) desire to interact with partner. Items (c) and (e) were reverse-coded, and a composite mean of these seven measures was constructed due to high internal reliability ($\alpha = .95$).

Demographics. Participants indicated their sex (*female; male; or prefer not to answer*), age, and racial/ethnic origin (1 *American Indian or Alaska Native*; 2 *Asian or Pacific Islander*; 3 *Black, not of Hispanic origin*; 4 *Hispanic*; 5 *White, not of Hispanic origin*; or 6 *Other*).

Analytic strategy. Consistent with selective exposure research (e.g., Hart et al., 2009), all article selections were recoded by their congeniality to the alleged partner based on that partner’s perceptions of the MEQ. For instance, for partners who scored well on the MEQ and

believed it was a valid measure of intelligence, pro-MEQ articles were coded as congenial, whereas anti-MEQ articles were coded as uncongenial; the opposite set of coding applied to partners who scored poorly on the MEQ and viewed it as an invalid measure of intelligence. A difference score of the number of congenial articles minus the number of uncongenial articles (common practice in selective exposure research; e.g., Hart et al., 2009) was constructed to reflect the degree of congeniality bias in participants' article selections for the recipient. Positive congeniality bias scores indicate that the recipient saw more congenial (vs. uncongenial) articles, whereas negative scores indicate seeing more uncongenial (vs. congenial) articles.

Results

Evaluations of partner. As a manipulation check of likability, participants in the likable partner condition rated their partners significantly more favorably ($M = 4.03$, $SD = 0.57$) than those in the unlikable partner condition ($M = 1.91$, $SD = 0.82$), $F_{1,142} = 314.98$, $p < .001$, $d = 3.00$. Partner evaluations were unaffected by the partner's perceived validity of the MEQ ($F_{1,142} = 0.12$, $p = .730$) and the interaction of the two factors ($F_{1,142} = 0.42$, $p = .519$).

Article selection. Participants selected an average of 3.81 ($SD = 1.61$) articles out of eight possible for their alleged partner, and this number was unaffected by the independent variables (likability: $F_{1,150} = 0.07$, $p = .797$; validity: $F_{1,150} = 0.00$, $p = .957$; interaction: $F_{1,150} = 0.47$, $p = .493$).

Next, an analysis of variance (ANOVA) examined the effects of likability and validity on congeniality bias. Results found a significant main effect of likability ($F_{1,150} = 18.46$, $p < .001$, $d = 0.49$), but no effects of validity ($F_{1,150} = 0.10$, $p = .749$) or the interaction of the two ($F_{1,150} = 0.02$, $p = .894$). Participants with likable partners showed a significantly greater congeniality bias ($M = 1.31$, $SD = 3.82$) than those with unlikable partners ($M = -0.56$, $SD = 3.80$), indicating that

participants chose more congenial information for likable partners, but more uncongenial information for unlikable partners. See Figure 2.

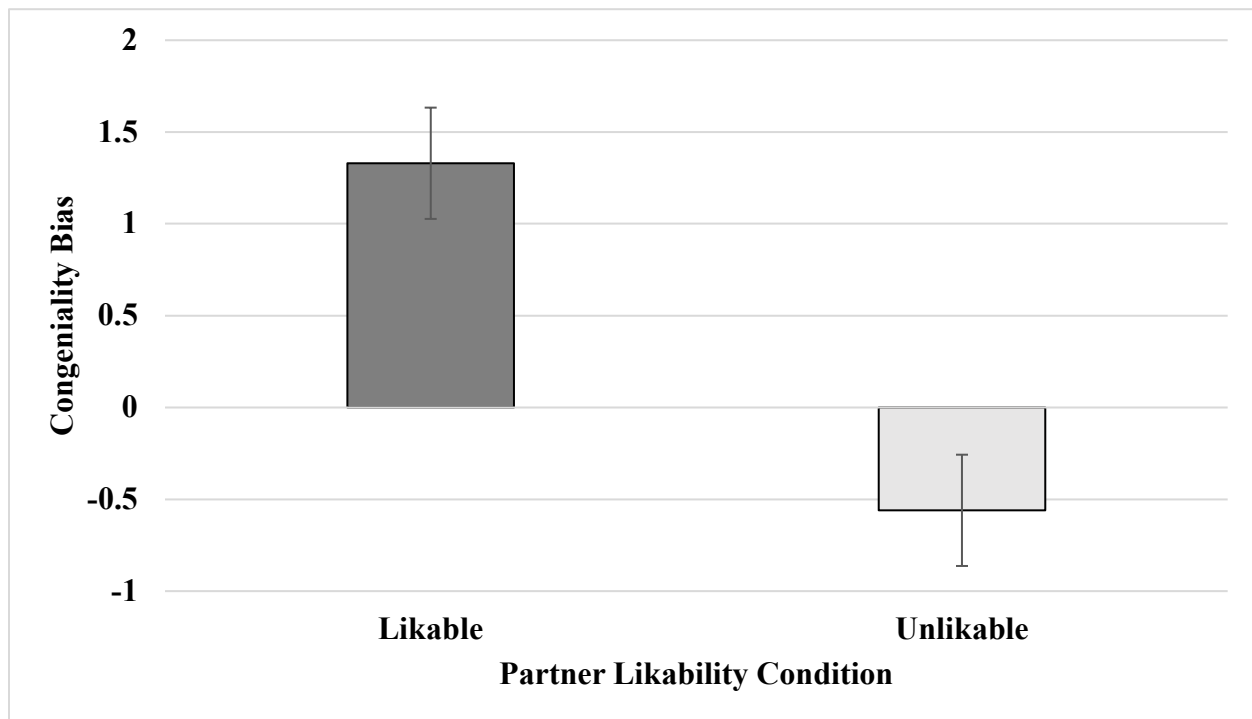


Figure 2. Mean congeniality bias scores as a function of partner likability condition, Study 1. Scores represent the difference of the number of uncongenial articles chosen from the number of congenial articles chosen. Error bars represent standard errors.

Hedonic experience. A linear regression of perceptions of the partner's hedonic experience from the articles on congeniality bias was significant, $B = 0.87$, $SE = 0.10$, $\beta = 0.58$, $t = 8.86$, $p < .001$, $R^2_{change} = .34$. Mediation analysis using PROCESS for SPSS (Model 4, 10,000 bootstrap samples; Hayes, 2013) found a significant indirect effect of partner likability on information congeniality via perceived hedonic experience ($B = 1.19$, $SE = 0.20$, 95% CI [0.82, 1.61]), indicating that the more participants considered the hedonic experience of the recipient, they more they chose congenial information.

Utility. A linear regression of the partner's perceived utility from the articles on congeniality bias was not significant ($B = -0.07$, $SE = 0.18$, $\beta = -0.03$, $t = -0.40$, $p = .692$),

indicating that participants' information choices were unrelated to perceptions of how much utility their partners would derive from the articles. Mediation analysis found no indirect effect of likability condition on congeniality via utility ($B = -0.09$, $SE = 0.06$, 95% CI [-0.22, 0.03]).

Discussion

Study 1 points to two conclusions about how people choose information for others in the context of a novel issue. First, participants were attentive not just to their partner's stance on the issue, but to that partner's likability. Participants chose largely congenial information for likable partners but mostly uncongenial information for unlikable partners, indicating that participants rewarded likable recipients with information supporting their views, but punished unlikable recipients with information that opposed their views.

Second, choosing congenial (vs. uncongenial) information for partners was associated with a motivation to increase partners' hedonic experiences, but not utility. Thus, participants chose mostly congenial information for likable partners because they anticipated their partners would find that information enjoyable to read, but not necessarily useful.

Next, Study 2 examines information selection for others as a function of the recipient's likability and stance on the issue, but an issue for which participants already hold an attitude.

Study 2

Like Study 1, Study 2 examines the influence of likability on information choice for others, but for a divisive issue for which participants are likely to hold an attitude: gun control. Therefore, beyond likability, Study 2 examines how agreement on gun control between the information selector and recipient influences information choice.

Method

Participants. Two hundred five American adults were recruited through MTurk for \$1.00. Like Study 1, participants were excluded for indicating that their data was not of high quality ($n = 2$) or failing the attention check ($n = 17$). The final sample was 186 participants (50.0% female; 76.9% non-Hispanic White; $M_{age} = 37.64$ years, $SD = 13.62$ years).

Design and procedure. Study 2 was very similar to Study 1, with one difference from Study 1: The topic in Study 2 was gun control—a known issue—instead of the MEQ test. Otherwise, Study 2 used the same cover story, independent variable manipulations (but with gun control), and procedure as Study 1. (See Appendix for manipulations.) Like Study 1, participants in Study 2 were aware of their alleged partner’s gun control attitude before selecting gun control articles for them. The added gun control attitude measures (detailed below) all occurred after the article selection phase.

Measures. Measures of hedonic experience ($\alpha = .85$), utility ($\alpha = .86$), evaluations of partner ($\alpha = .95$), and demographics were the same as Study 1. Study 2 added the following measures:

Article selection. Like Study 1, the article selection in Study 2 presented participants with eight thesis statements that either supported or opposed—four statements of each variety—but with the issue of gun control.

Selection factors. After article selection, participants indicated the extent to which various factors influenced their selection decisions. On a 7-point scale (1 *not at all* – 7 *extremely*), participants indicated the influence of: (a) my own beliefs and attitudes; (b) my partner’s beliefs and attitudes; (c) my personality; (d) my partner’s personality; (e) I chose articles at random; and (f) other (please specify).

Gun control attitude. Participants' gun control attitudes were calculated by averaging responses to six semantic differential scales (*desirable-undesirable*, *foolish-wise*, *good-bad*, *harmful-beneficial*, *necessary-unnecessary*, and *positive-negative*), from 1 to 9 ($\alpha = .99$).

Gun control stance. Using a binary response (1 *pro-gun control*; 2 *anti-gun control*), participants indicated their gun control stance.

Analytic strategy. A binary "partner agreement" variable was constructed using the fictitious partner's binary stance on gun control (pro or anti) and the participant's stated stance on gun control. Regardless of direction of stance, a score of -1 was assigned when the participant's gun control stance did not align with their partner's, and a score of 1 was assigned when the two stances aligned. Binary logistic regression found that the six-item gun control attitude composite significantly predicted a participant's binary gun control stance, $B = 1.17$, $SE = 0.18$, $Wald = 42.93$, $\beta = 3.23$, $p < .001$.

Like Study 1, articles were recoded by congeniality to the alleged partner based on that partner's gun control stance. A congeniality bias difference score was constructed by subtracting the number of uncongenial articles chosen from congenial articles chosen (like Study 1).

Results

Evaluations of partner. As a manipulation check of likability, participants in the likable partner condition rated their partners significantly more favorably ($M = 3.84$, $SD = 0.63$) than those in the unlikable partner condition ($M = 1.86$, $SD = 0.73$), $F_{1, 163} = 349.91$, $p < .001$, $d = 2.90$. Partner evaluations were unaffected by whether the participant and partner agreed on gun control ($F_{1, 163} = 1.16$, $p = .282$) or the interaction of both factors ($F_{1, 163} = 0.19$, $p = .663$).

Article selection. Participants selected an average of 3.90 ($SD = 1.66$) articles out of eight possible for their partner, which was unaffected by the independent variables (likability: $F_{1, 173} = 0.66, p = .418$; agreement: $F_{1, 173} = 0.02, p = .897$; interaction: $F_{1, 173} = 2.37, p = .125$).

Using the congeniality bias difference score, ANOVA indicated that when choosing information for a partner, participants still exhibited a significant selective exposure bias (Hart et al., 2009) based on their own preferences, regardless of congeniality ($F_{1, 182} = 67.25, p < .001, d = 1.32$). Participants with an anti-gun control stance chose more anti-gun control articles for their partner ($M = -1.57, SD = 2.22$), whereas those with a pro-gun control stance chose more pro-gun control articles for their partner ($M = 1.19, SD = 1.97$). The information recipient's gun control stance ($F_{1, 182} = 0.28, p = .597$) and the interaction of both factors ($F_{1, 182} = 0.70, p = .406$) did not affect information selection.

Next, ANOVA examined the effect of two factors—partner likability and participant-partner agreement on gun control—on congeniality bias. There was no main effect of partner likability ($F_{1, 173} = 0.63, p = .427$), but there was a significant effect of partner agreement ($F_{1, 173} = 66.90, p < .001, d = 1.21$) and an interaction of likability and agreement ($F_{1, 173} = 4.94, p = .028, \eta_p^2 = .028$). For partner agreement, partners who agreed with the participant received mostly congenial information ($M = 1.36, SD = 2.08$), whereas those who disagreed received mostly uncongenial information ($M = -1.20, SD = 2.14$). This is consistent with the previous analysis showing that participants generally selected what they—not their partners—preferred based on their own gun control views. Finally, the interaction of likability and agreement found that although the congeniality of articles chosen for the information recipient was primarily influenced by agreement on gun control, these effects were amplified when that partner was likable (vs. unlikable). Partners who agreed with participants received significantly more

congenial information when they were likable ($M = 1.85$, $SD = 4.10$) compared to unlikable ($M = 0.90$, $SD = 3.96$; $F_{1, 173} = 4.92$, $p = .028$, $d = 0.24$); for those who disagreed, however, likability made no difference in the amount of congenial information they received ($F_{1, 173} = 0.95$, $p = .332$). See Figure 3.

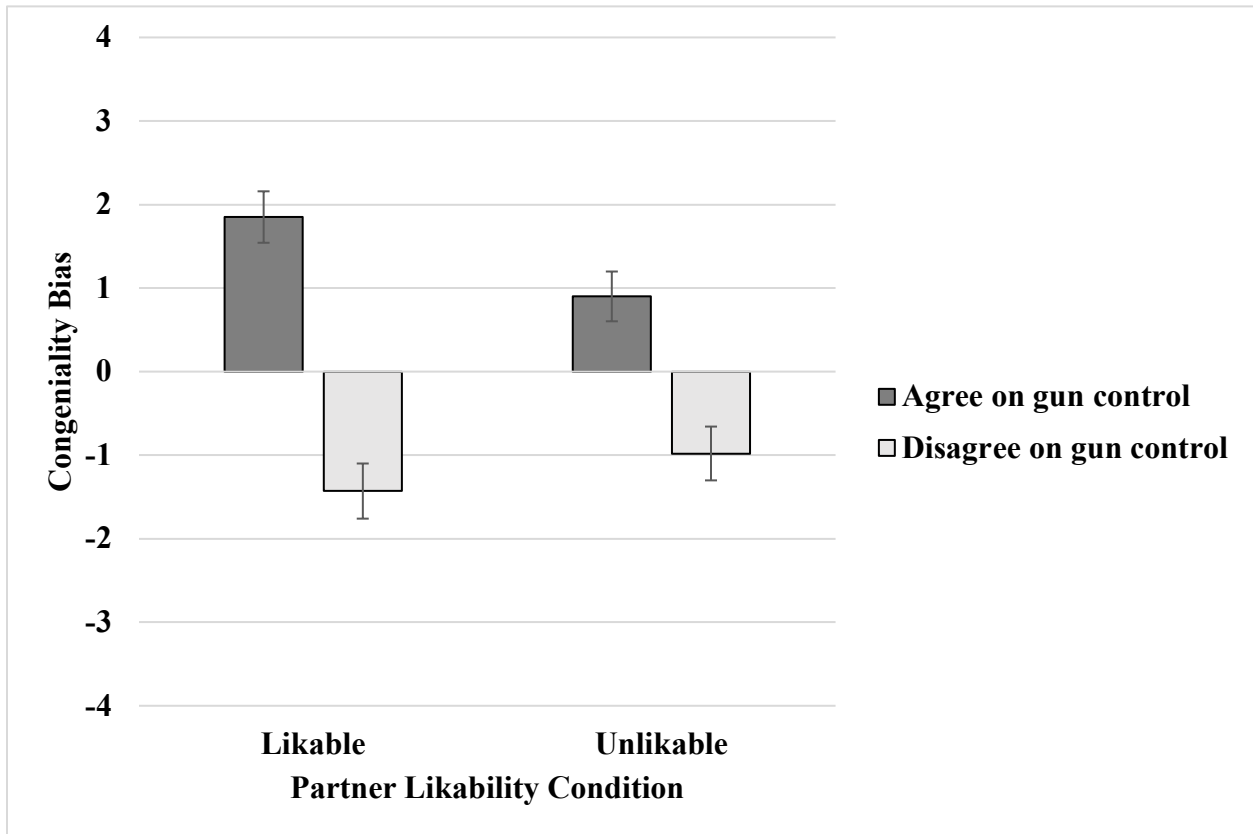


Figure 3. Mean congeniality bias scores as a function of partner likability condition and partner agreement, Study 2. Scores represent the difference of the number of uncongenial articles chosen from the number of congenial articles chosen. Error bars represent standard errors.

Hedonic experience. A linear regression of perceptions of the partner’s hedonic experience on congeniality bias was significant, like Study 1 ($B = 0.54$, $SE = 0.17$, $\beta = 0.22$, $t = 3.09$, $p = .002$, $R^2_{change} = .05$): When participants considered the hedonic experience of the recipient, they chose more congenial information. Next, mediational analysis (PROCESS Model 4; Hayes, 2013) found that likability significantly influenced hedonic perceptions ($B = 0.39$, $SE = 0.07$, $t = 5.79$, $p < .001$, 95% CI [0.26, 0.53]), indicating that hedonic experience was considered

more for likable (vs. unlikable) partners. There was also a significant indirect effect of likability on congeniality bias via hedonic perceptions ($B = 0.23$, $SE = 0.09$, 95% CI [0.06, 0.40]).

However, analysis of moderated mediation (PROCESS Model 7; Hayes, 2013) using partner agreement as a moderator of likability on hedonic perceptions found no effect ($B = 0.06$, $SE = 0.09$, 95% CI [-0.09, 0.27]), indicating that likability, not partner agreement, influenced whether participants considered recipients' hedonic experiences.

Utility. A linear regression of perceptions of the partner's utility from the articles on congeniality bias found no association, like Study 1 ($B = 0.10$, $SE = 0.18$, $\beta = 0.04$, $t = 0.57$, $p = .569$). Mediation ($B = 0.00$, $SE = 0.02$, 95% CI [-0.02, 0.04]) and moderated mediation ($B = 0.00$, $SE = 0.03$, 95% CI [-0.06, 0.07]) analyses found no effects of likability on congeniality bias via utility perceptions. Thus, participants again did not consider the utility of information for their partners when they chose more congenial information, unlike for hedonic perceptions.

Selection factors. Participants' considerations when selecting articles for their partners were analyzed by creating mean composites for the two self factors ("my personality" and "my beliefs and attitudes"; $r = .55$, $p < .001$) and the two partner factors ("my partner's personality" and "my partner's beliefs and attitudes"; $r = .59$, $p < .001$). A mixed-model ANOVA with three within-subject selection factors (self factors, partner factors, and random) and two between-subject factors (likability, partner agreement) found no significant effects except for an interaction of likability and selection factors ($F_{1, 173} = 3.95$, $p = .048$, $\eta_p^2 = .022$). Simple effects analyses revealed that the only significant difference between likable and unlikable partners occurred for the randomness factor ($F_{1, 173} = 8.17$, $p = .005$, $d = 0.30$): Participants reported relying on randomness as a factor more for unlikable ($M = 1.88$, $SD = 1.82$) than likable ($M = 1.32$, $SD = 1.88$) partners. Thus, likability and partner agreement had no effects on whether

participants reported considering self- or partner-oriented factors when choosing information for their partner. That participants did not rely on partner factors is consistent with the results that participants generally relied on their own gun control attitudes to choose information for their partners. However, the finding that participants did not consider their partner's personality and attitudes is inconsistent with the previous result that likability did affect participants' information selections.

Discussion

Study 2 replicated and expanded upon several findings from Study 1 regarding how people choose information for others, but instead using an issue—gun control—for which participants had an attitude. The major difference between Studies 1 and 2 was that when participants had an attitude about the topic, compatibility of their partner's attitude on gun control was a significant factor in their selection decisions for that partner; indeed, Study 2 participants generally chose articles that were consistent with their own gun control attitudes, which were congenial to agreeable partners, but not disagreeable ones. However, likability in Study 2 still mattered such that likable (vs. unlikable) partners were rewarded with more congenial information when they agreed with the participant. Thus, participants were even more attuned to likable partners' attitudes, but not unlikable partners' attitudes.

Study 2 also replicated Study 1 by showing that congenial information selections were driven by considerations of whether one's partner would enjoy the information (i.e., hedonic perceptions), but not necessarily if they would find it useful (i.e., utility). Lastly, Study 2 found that participants generally did not consider their partner's personality or attitudes when selecting information. Thus, when it came to a contentious political topic, selectors chose based on what they personally found congenial, but not recipients. Although agreeable and likable participants

received an extra boost of congenial information, those who were likable but disagreed with the participant on gun control received mostly uncongenial information.

Next, Studies 3-4 examine the opposite perspective in these informational exchanges: How do information *recipients* view information, and information selectors, as a function of likability and agreement on the issue?

Study 3

In Studies 1-2, participants selected information for fictitious partners (i.e., recipients). Study 3 turns to the recipient's perspective to address several questions raised by the results of Studies 1-2. In Studies 1-2, participants chose more congenial information for partners when they considered their partners' hedonic experiences, but not utility; in Study 3, will recipients similarly consider congenial information to be more hedonically enjoyable, but not more useful? Studies 1-2 also found this effect particularly for likable recipients; for recipients in Study 3, will the selector's likability affect their appraisals—hedonic or utility—of received information?

Method

Participants. One hundred eighty-five undergraduate students (73.3% female; 67.6% non-Hispanic White; $M_{age} = 18.76$ years, $SD = 0.90$ years) enrolled in an introductory psychology course participated for course credit. The stopping point for data collection was determined by the end of the academic semester.

Design. Study 3's design took one of two forms depending on how many participants were in the study at a given time. If there were an even number of participants, then participants were divided evenly between two lab rooms and partnered with one participant of the same sex in the other lab room; however, participants only communicated with their partners via an Internet chat program and were never introduced face-to-face. In this case, the study involved

one between-subject factor: the randomly generated balance of gun control information received (three levels: biased in favor of gun control, balanced, or biased against gun control). These conditions applied to 99 participants in Study 3.

However, if there were an odd number of participants, then the last participant who could not be paired with another participant instead exchanged information with a fictitious selector partner, similar to how selectors in Studies 1-2 exchanged information with a fictitious recipient. These Study 3 participants did not interact with a true partner but were not aware that their experiences were different from those of the other participants who were paired with a true, living partner. For these participants, the study had two between-subject factors: the randomly generated balance of gun control information received (same as participants in the previous condition) and likability of the fictitious partner (likable or unlikable). These conditions applied to 86 participants in Study 3.

Procedure. Participants were told that the study's goal was to assess how various materials could help individuals gain an understanding of a current issue, and that they would be working with another participant to complete an information reviewing task. Participants were always told that their partner was randomly chosen to be the information "selector," leaving them to be the information "receivers." Participants were told that should review the information allegedly selected by their partner. Before the reviewing task, participants were informed that they would first engage in a brief exercise to get to know their partner.

For participants who were paired with an actual partner (located in a different room), a survey guided them through the Relationship Closeness Induction Task (RCIT; Sedikides, Campbell, Reeder, & Elliot, 1999). During the task, individuals take turns answering 3 lists of questions designed to induce interpersonal closeness and familiarity. Each list contains 7-12

questions (e.g., “What are your hobbies?” or “What is something you have always wanted to do but probably will never be able to do?”) designed to elicit reciprocal conversation. Participants interacted with each other only via an instant-messaging program and posted responses to each question in the program’s chat window. See Appendix for full RCIT questionnaire.

For participants with a fictitious partner (whom they believed was located in another room), a survey guided them through a series of prompts to exchange some personal information with the fictitious partner. These questions were the same as those in Studies 1-2, except for the question about one’s MTurk worker experience. The “selector’s” responses to these questions were designed to make the individual seem likable or unlikable (like Studies 1-2). See Appendix for manipulation.

After this interaction, participants were told that gun control was the randomly chosen issue of focus for the study and reported their gun control attitudes; which they were told their partner (the selector) had access to. Then, participants were randomly assigned to one of three information conditions: biased in favor of gun control, with three pro-gun control messages and one anti-gun control message; balanced, with two pro- messages and two anti- ones; or biased against gun control, with one pro- message and three anti- ones. Across all conditions, articles were randomly generated from batches of four pro- and four anti- messages. After reading the messages, participants evaluated them for hedonic experience and utility.

Lastly, participants completed evaluation measures of their partner, perceived similarity of their gun control views to their partner and the average American, and demographic questions.

Measures. All measures of hedonic experience ($\alpha = .77$), utility ($\alpha = .87$), partner evaluations ($\alpha = .93$), gun control attitude ($\alpha = .96$), gun control stance, and gun control consensus were the same as Study 2. The following measures were added:

Perceptions of bias. After reading all the gun control messages, participants completed four measures designed to assess perceptions of the objectivity (or bias) of the information they received. All four measures used 7-point scales (1 *not at all* to 7 *very much*) and participants indicated to what extent the gun control information they read: (a) accurately represented *their own opinion* on gun control; (b) accurately represented *multiple points of view* on gun control; (c) was *useful to them* for understanding gun control; and (d) was *useful for the average American* for understanding gun control.

Gun control similarity. Like gun control consensus, participants estimated the perceived similarity of their partner's gun control attitude with their own using a slider scale (0 *least similar* – 100 *most similar*).

Analytic strategy. At the end of the study, participants in the live partner condition were asked whether or not they knew their partner. Nine participants reported knowing their partners and were excluded from analyses due to the chance that their experience was significantly different from those who did not know their partners before the RCIT (Sedikides et al., 1999).

Like prior studies, the information balance conditions were recoded as a function of congeniality to the recipient (the participant) based on their dichotomous stance on gun control. Binary logistic regression found that the six-item gun control attitude composite predicted a participant's binary gun control stance, $B = 2.00$, $SE = 0.40$, $Wald = 2.76$, $\beta = 7.42$, $p < .001$.

Results

Hedonic experience. ANOVA of partner condition (fictitious or real) and information congeniality on hedonic experience found a main effect of information congeniality ($F_{2, 167} = 3.15$, $p = .045$, $\eta_p^2 = .04$), but no effect of partner condition ($F_{1, 167} = 1.30$, $p = .255$) or the interaction of the two ($F_{2, 167} = 0.50$, $p = .607$). Participants rated information as significantly

more negative when they received largely uncongenial information ($M = 4.05$, $SD = 1.02$) compared to the congenial ($M = 4.40$, $SD = 0.95$; $p = .030$) and balanced ($M = 4.41$, $SD = 0.98$; $p = .030$) conditions. The congenial and balanced conditions did not differ significantly ($p = .956$).

Within just the fictitious partner condition, there was a marginal effect of likability ($F_{1, 80} = 3.50$, $p = .065$), but no effects of information congeniality ($F_{2, 80} = 1.03$, $p = .362$) or their interaction ($F_{2, 80} = 2.49$, $p = .089$) on hedonic ratings. However, within just the RCIT partner condition, hedonic ratings were positively associated with evaluations of the selector ($B = 0.30$, $SE = 0.10$, $\beta = 0.32$, $t = 3.06$, $p = .003$), but did not differ by information congeniality ($F_{2, 84} = 1.60$, $p = .209$).

Utility. ANOVA of the two independent variables on utility ratings of the received information found no effects of partner condition ($F_{2, 169} = 0.54$, $p = .462$), information congeniality ($F_{2, 169} = 1.74$, $p = .178$), or their interaction ($F_{2, 169} = 0.31$, $p = .732$).

Within just the fictitious partner condition, there were no effects of likability ($F_{1, 79} = 0.49$, $p = .485$), information congeniality ($F_{2, 79} = 1.58$, $p = .212$), or their interaction ($F_{2, 79} = 0.28$, $p = .755$) on utility ratings. However, within just the RCIT partner condition, utility ratings were positively associated with evaluations of the selector ($B = 0.30$, $SE = 0.11$, $\beta = 0.28$, $t = 2.71$, $p = .008$), but did not differ by information congeniality ($F_{2, 87} = 0.62$, $p = .538$). This finding differs from Studies 1-2, in which selectors did not expect likable recipients to derive more utility from information. Here, recipients in the RCIT condition derived additional hedonic enjoyment and utility from information chosen by likable selectors.

Evaluations of partner. As a manipulation check in the fictitious partner condition only, ANOVA found a significant effect of likability condition ($F_{1, 82} = 126.27$, $p < .001$, $d = 2.45$),

indicating a successful manipulation: Likable fictitious partners were rated more positively ($M = 5.96$, $SD = 1.01$) than dislikable fictitious partners ($M = 3.13$, $SD = 1.28$).

Next, we used ANOVA to assess the effects of information congeniality condition and partner condition on partner evaluations. Analyses indicated a marginal effect of information congeniality ($F_{2, 168} = 2.84$, $p = .061$, $\eta_p^2 = .03$), indicating that participants who received mostly uncongenial information viewed their partners less positively ($M = 5.34$, $SD = 2.59$) than those who received balanced ($M = 5.92$, $SD = 2.55$; $p = .039$) or mostly congenial ($M = 5.90$, $SD = 2.47$; $p = .040$) information; the congenial and balanced conditions did not differ significantly ($p = .966$). There was also a main effect of partner condition ($F_{1, 168} = 126.88$, $p < .001$, $d = 1.61$), showing that participants with live partners had significantly more positive impressions ($M = 6.97$, $SD = 2.02$) than those with fictitious partners ($M = 4.47$, $SD = 2.11$). Finally, there was a significant information congeniality by partner condition interaction ($F_{2, 168} = 4.24$, $p = .016$, $\eta_p^2 = .05$). For participants paired with fictitious partners, the congeniality of information received mattered significantly ($F_{2, 168} = 5.90$, $p = .003$, $\eta_p^2 = .07$): Participants who received mostly uncongenial information viewed their partners less positively than those who received balanced ($M_{diff} = -1.08$, $SE = 0.41$; $p = .009$) and mostly congenial ($M_{diff} = -1.34$, $SE = 0.40$; $p = .001$) information. However, for participants with live partners, the type of information received had no effect on their partner evaluations ($F_{2, 168} = 0.30$, $p = .740$). See Figure 4.

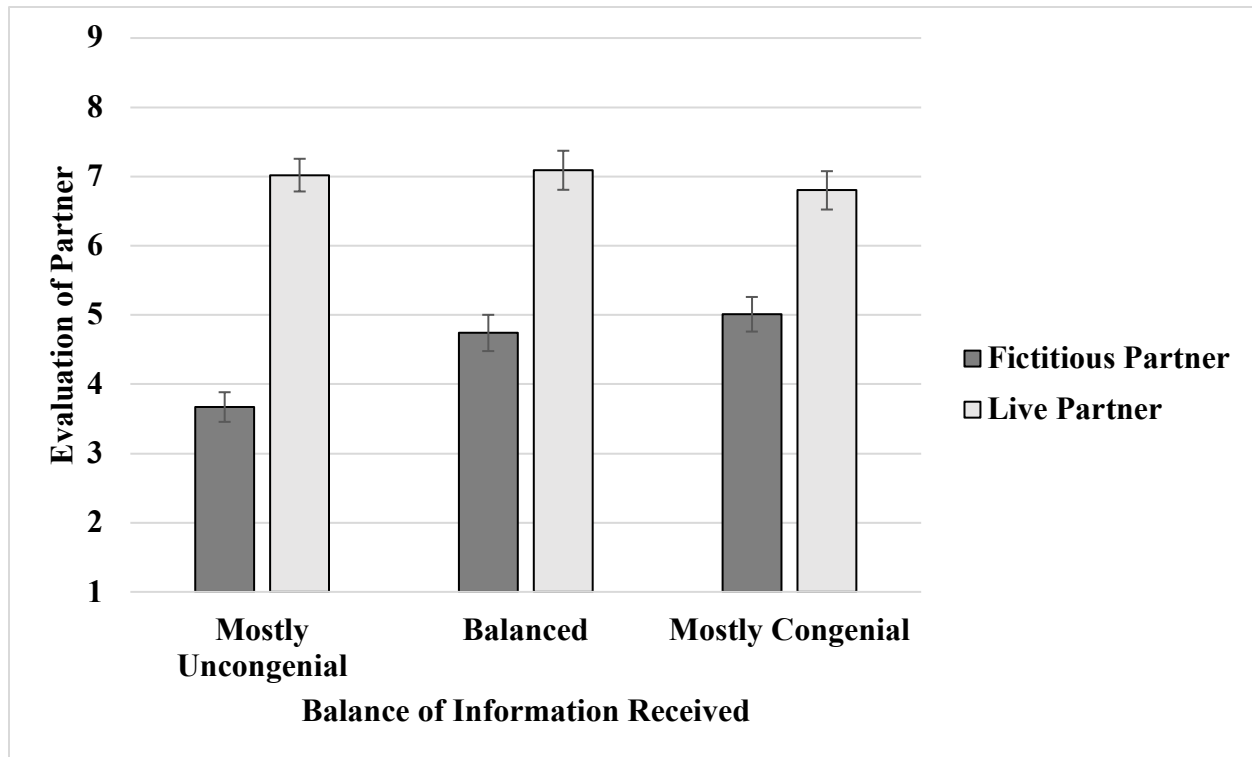


Figure 4. Mean evaluations of partner (selector) as a function of information congeniality and partner condition, Study 3. Error bars represent standard errors.

These results suggest two conclusions. First, engaging in the RCIT (Sedikides, 1999) with a live partner almost always led to a positive interaction. Second, these highly positive views of one’s partner appeared to blunt any effects of the congeniality of the information ostensibly chosen by one’s partner. Participants with fictitious partners judged partners differently according to the balance of information they received, whereas participants with (mostly likable) live partners did not use that information to inform their partner evaluations.

Gun control consensus. ANOVA found no effects of information congeniality ($F_{2, 169} = 1.58, p = .209$), partner condition ($F_{2, 169} = 2.37, p = .126$), or their interaction ($F_{2, 169} = 0.40, p = .673$) on the perceived percentage of Americans who share the participant’s views on gun control. When split out by partner condition, there were no significant effects.

Gun control similarity. ANOVA indicated effects of information congeniality ($F_{2, 168} = 10.06, p < .001, \eta_p^2 = .11$) and partner condition ($F_{1, 168} = 10.93, p = .001, d = 0.37$) on perceived similarity of the selector's views on gun control, although no interaction of the two ($F_{2, 168} = 1.47, p = .323$). For information congeniality, participants perceived greater attitudinal similarity with their partner after receiving mostly congenial ($M = 62.65, SD = 35.35$) compared to balanced ($M = 51.57, SD = 36.09; p = .004$) and mostly uncongenial ($M = 45.43, SD = 37.66; p < .001$) information. The balanced and uncongenial conditions did not differ significantly ($p = .122$). For partner condition, participants with live partners ($M = 58.48, SD = 29.17$) perceived more similar gun control views with their partners than those with fictitious partners ($M = 47.95, SD = 30.23$).

Within the fictitious partner condition, there was an effect of likability ($F_{1, 79} = 7.09, p = .009, d = 0.41$) such that likable partners were perceived as more attitudinally similar ($M = 55.07, SD = 33.71$) than unlikable partners ($M = 41.66, SD = 31.96$). There was also a significant effect of information congeniality ($F_{2, 79} = 6.30, p = .003, \eta_p^2 = .14$) that mirrored the effect for the combined data, but no interaction of the two ($F_{2, 79} = 0.26, p = .770$). For the RCIT condition, there was no significant effect of information congeniality ($F_{2, 86} = 2.67, p = .075$), but attitudinal similarity was positively associated with selector likability ($B = 5.23, SE = 2.80, \beta = 0.30, t = 2.90, p = .005$).

Perceptions of bias. In their assessments of how useful and accurate the information they read was, participants were significantly influenced by information congeniality for measures of the articles' accuracy in representing their own view on gun control ($F_{2, 169} = 8.65, p < .001, \eta_p^2 = .09$) and multiple points of view on the issue ($F_{2, 169} = 9.17, p < .001, \eta_p^2 = .10$). Measures of

usefulness to oneself and to the average American were not significantly influenced by information congeniality condition.

For their own opinion on gun control, participants (rightly) felt their views were most accurately represented when they received mostly congenial information ($M = 4.46$, $SD = 1.81$) compared to mostly uncongenial ($M = 3.64$, $SD = 1.90$; $p < .001$) and balanced ($M = 4.07$, $SD = 1.85$; $p = .046$) information; the uncongenial and balanced conditions also differed significantly ($p = .033$).

For the accuracy in representing multiple points of view, participants displayed a different pattern that was probably accurate: Participants who received balanced information rated it as being most representative of multiple points of view on gun control ($M = 5.65$, $SD = 2.83$) compared to mostly congenial ($M = 4.42$, $SD = 2.75$; $p < .001$) and mostly uncongenial ($M = 4.73$, $SD = 2.91$; $p = .003$) information. The congenial and uncongenial conditions did not differ significantly ($p = .304$).

However, participants displayed more biased perceptions of the information they read as a result of how much they liked the information selector. Controlling for the actual balance of information they read, hierarchical linear regressions using partner evaluations indicated that having a likable partner led participants to see the information they read as useful for themselves ($B = 0.13$, $SE = 0.06$, $\beta = 0.17$, $t = 2.29$, $p = .023$, $sr^2 = .03$) and the average American in understanding gun control ($B = 0.19$, $SE = 0.06$, $\beta = 0.25$, $t = 3.32$, $p = .001$, $sr^2 = .06$).

But, having a more likable partner did not affect participants' ratings of how accurately the information represented their own point of view ($B = 0.07$, $SE = 0.04$, $\beta = 0.11$, $t = 1.54$, $p = .125$) or multiple points of view ($B = 0.12$, $SE = 0.07$, $\beta = 0.13$, $t = 1.75$, $p = .082$).

Discussion

Study 3 pointed to several conclusions about how likability, interaction closeness, and information congeniality affects recipients' views of information and its selector. Hedonic and utility ratings of information, regardless of congeniality, were associated with positive evaluations of the alleged selector for actual (RCIT) partners, but not fictitious ones. This indicates somewhat of a mismatch between recipients and selectors: The selectors in Studies 1-2 expected information to be more hedonically enjoyable as it became more congenial, but Study 3 recipients were more attuned to the likability of the selector (especially with live partners). Another mismatch came from utility ratings: Study 3 recipients found information more useful both when it came from likable selectors (especially with actual partners), despite the findings in Studies 1-2 that congenial information was not expected to be more useful to the recipient.

When it came to partner evaluations, there was a significant divide between having a fictitious or actual partner: Fictitious partners' evaluations were contingent upon the balance of information that they ostensibly chose for the participants, but actual partners' evaluations were mostly unaffected by information congeniality. The actual partners in the RCIT condition were also evaluated much more favorably than even the likable, fictitious partners, indicating that the increased closeness of the RCIT not only led to a more positive selector-recipient bond, but also blunted any negative effects of receiving uncongenial information.

Although partner condition and information congeniality had no effects on perceived attitudinal consensus in the U.S. about gun control, they did affect perceptions of attitudinal similarity with the selector: Participants perceived greater similarity with likable partners and partners they believed had chosen mostly congenial information for them. Lastly, when it came to perceptions of bias, participants' views of the utility of the information they received—regardless of congeniality—was affected by the partner likability: When participants liked the

alleged selector, they saw the information they received as being more useful to themselves and the average American.

Study 4 again examines recipients who receive random balances of information from alleged selectors, but with two changes from Study 3. First, Study 4 only uses the RCIT (i.e., no fictitious partner condition). But, because Study 3 participants overwhelmingly enjoyed their RCIT partners, Study 4 pairs some participants with a scripted, unlikable RCIT partner. Second, Study 4 measures why recipients think their selection of information was chosen for them.

Study 4

Study 4 had the goal of replicating Study 3 with a bigger sample, in a context of increased interpersonal closeness (i.e., RCIT), and with an unlikable confederate to increase variance in participants' evaluations of their partners, which were highly positive in Study 3. Study 4 also examined participants' perceptions of why they received their particular batch of gun control information, which was actually assigned at random. These measures aimed to shed light *de facto* selective exposure processes; in particular, we were interested in assessing the extent to which participants believed they actively influenced their own information environments. For example, if participants believed that they received information because of their own personality or attitudes (i.e., believing they had agentic influence) would illustrate belief in attitude selectivity and relative unawareness of *de facto* selective exposure influences.

Method

Participants. One hundred sixty-six undergraduate students (53.20% female; 69.50% non-Hispanic White; $M_{age} = 18.74$ years, $SD = 0.91$ years) enrolled in an introductory psychology course participated for course credit. The stopping point for data collection was determined by the end of the academic semester.

Design. Like Study 3, the design and procedure of Study 4 differed depending on the number of participants in a time slot. Across all participants, there was one between-subject factor in Study 4: balance of gun control information. When an even number of participants were present, the design was the same as the even-number condition in Study 3: Participants were paired with a live partner in another lab room, and they had an organic interaction with this partner using the RCIT (Sedikides et al., 1999). This condition applied to 126 participants.

When an odd number of participants were present, they had a slightly different study experience (unbeknownst to them), like the odd participants in Study 3. However, this odd participant in Study 4 still interacted with a live partner, though this partner was actually a confederate from the research team (“Alex”) who completed the RCIT using a pre-tested script designed to make them seem unlikable. These odd participants were routed into this “unlikable confederate” condition in order to fully utilize the number of participants available at a given time (like Study 3), but also to add variance in participants’ evaluations of their partners, which were highly positive in Study 3. This condition applied to 28 participants.

Procedure. The procedure for Study 4 was almost identical to Study 3, with two exceptions. First, the odd participants interacted with a live confederate instead of a fictitious, nonexistent participant (as in Study 3). This confederate’s scripted responses to the RCIT questions were deliberately rude and pompous; for example, in response to the question, “What are your hobbies?” the confederate responded: *no point in telling you...it’s not like we would ever hang out.* Or, in response to the question, “What is one habit you’d like to break?” the confederate responded: *i always stop for pedestrians who are trying to cross the street, but what’s the point? i got places to be.* See Appendix for full responses.

Second, Study 4 added measure to assess participants' perceptions of the factors that influenced the balance of information they received.

Measures. All measures of hedonic experience ($\alpha = .76$), utility ($\alpha = .85$), partner evaluations ($\alpha = .93$), bias perceptions, gun control attitude ($\alpha = .99$), gun control stance, gun control consensus, and perceived similarity of the selector's gun control attitude were the same as Study 3. The following measures were added:

Box model. Adapted from Pronin and Kugler (2010), the box model was designed to let participants visually express the relative influence of various factors on a given outcome. To measure how participants perceived the relative influence of various factors on their partner's ostensible choice of gun control messages for them, participants were asked to think about their partner's choice of information for them and consider what factors influenced that decision.

Participants were provided with five suggested factors that could have influenced this decision: (1) your own beliefs and attitudes; (2) your personality; (3) your partner's beliefs and attitudes; (4) your partner's personality; and (5) random chance. Participants were told that this list was not exhaustive and that they could use or exclude any factor; they could also write in any other factors not covered by these five.

Using graph paper and a pencil, participants drew a box for each of the factors they felt was relevant to the outcome of their partner's choice of information for them, with an arrow going from each factor to that common outcome. The relative influence of each factor was depicted by the size of the box representing that factor; the larger the box for a factor, the greater the influence of that factor on the outcome. Weightings of each factor were calculated by computing the area of the box for each factor divided by the total area of all the factor boxes combined. The instructions and an example box model are available in the Appendix.

Analytic strategy. Like Study 3, participants in the live partner condition indicated whether they knew their partner at the end of the study. Twelve participants reported knowing their partners and were therefore excluded from analyses.

Like prior studies, the information balance conditions were recoded as a function of congeniality to the recipient (the participant) based on their dichotomous stance on gun control. Binary logistic regression found that the six-item gun control attitude composite predicted a participant's binary gun control stance, $B = 1.70$, $SE = 0.34$, $Wald = 24.56$, $\beta = 5.48$, $p < .001$.

All analyses that incorporate participants' partner evaluations as a factor in ANOVA use a continuous, standardized version of the composite evaluations that is analyzed at three levels: one standard deviation below the mean, one standard deviation above the mean, and mean level.

Results

Hedonic experience. For participants' hedonic experience of the articles, ANOVA indicated a significant effect of information congeniality condition ($F_{2, 135} = 3.77$, $p = .025$, $\eta_p^2 = .053$): Participants rated the information as more hedonically pleasing when they received mostly congenial information ($M = 4.50$, $SD = 1.06$) compared to both balanced ($M = 4.02$, $SD = 0.97$; $p = .064$) and uncongenial ($M = 3.83$, $SD = 1.27$; $p = .003$) information; balanced and uncongenial did not significantly differ ($p = .290$). A main effect of participants' partner evaluations also occurred ($F_{1, 135} = 7.09$, $p = .009$, $\eta_p^2 = .050$) such that participants who liked their partners more also rated the information they read more positively. There was no significant interaction of information congeniality and partner evaluations ($F_{2, 135} = 1.56$, $p = .213$). See Figure 5.

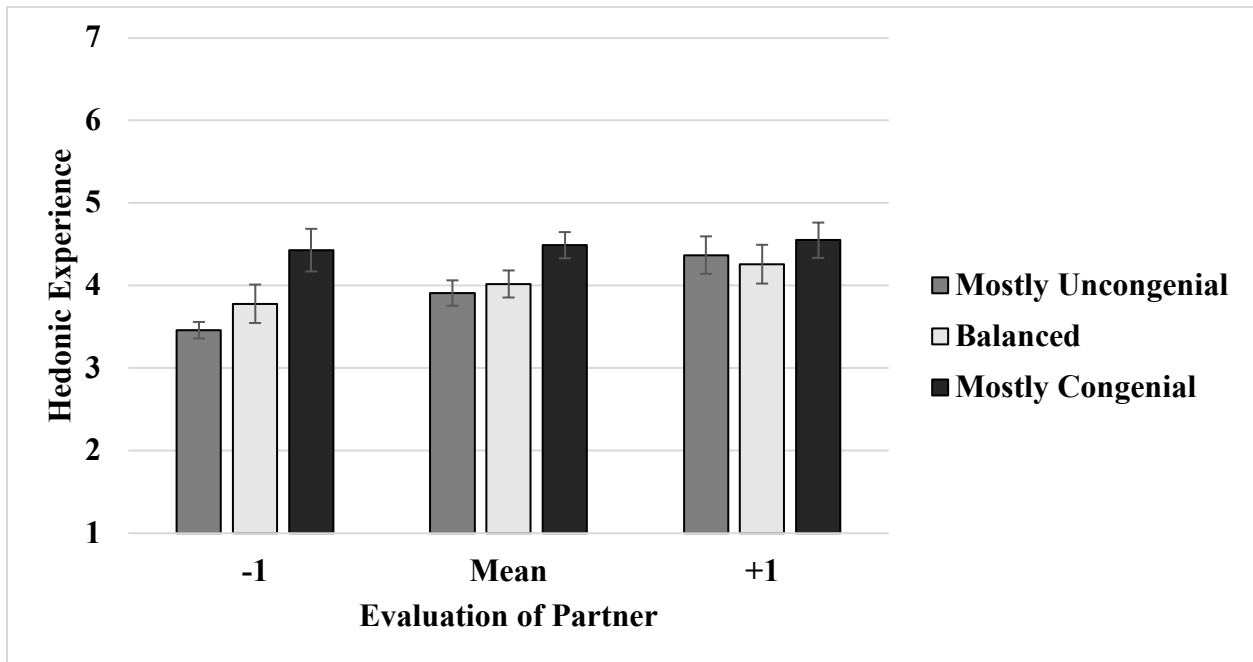


Figure 5. Mean hedonic experience ratings of information as a function of information congeniality and evaluation of partner. Evaluation of partner is plotted at minus one standard deviation below the mean, mean level, and plus one standard deviation above the mean. Error bars represent standard errors.

Utility. For ratings of information utility, ANOVA found a significant effect of information congeniality ($F_{2, 134} = 3.37, p = .037, \eta_p^2 = .048$), which followed a similar pattern as hedonic ratings: mostly congenial information was seen as more useful ($M = 4.04, SD = 0.95$) than balanced ($M = 3.52, SD = 1.17; p = .044$) or mostly uncongenial ($M = 3.45, SD = 1.13; p = .010$) information; again, balanced and uncongenial conditions did not differ significantly ($p = .677$). Like hedonic ratings, a main effect of partner evaluations occurred ($F_{1, 134} = 9.67, p = .002, \eta_p^2 = .067$), again following a similar pattern as the hedonic ratings. Lastly, there was again no significant two-way interaction ($F_{2, 134} = 1.07, p = .344$). See Figure 6.

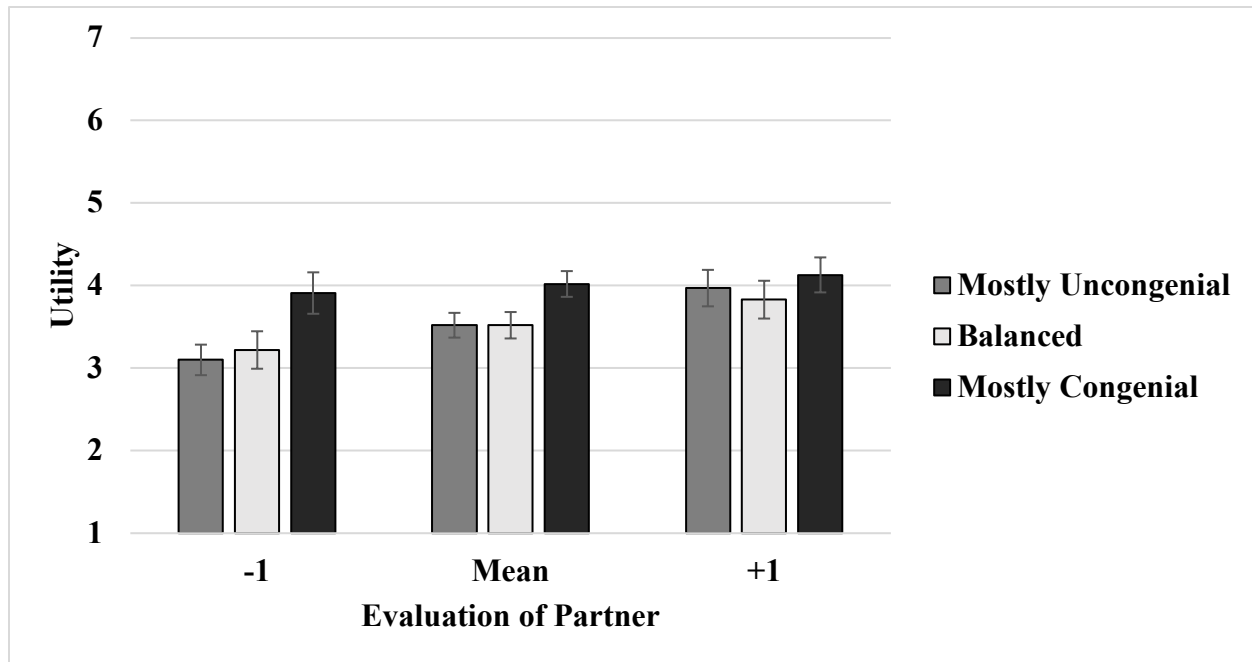


Figure 6. Mean utility ratings of information as a function of information congeniality and evaluation of partner. Evaluation of partner is plotted at minus one standard deviation below the mean, mean level, and plus one standard deviation above the mean. Error bars represent standard errors.

Evaluations of partner. As a manipulation check, ANOVA found a significant effect of partner condition ($F_{1, 135} = 255.20, p < .001, d = 2.97$): Participants reported more positive impressions of live partners ($M = 6.61, SD = 0.96$) than the unlikable confederate ($M = 3.03, SD = 1.41$), indicating a successful manipulation.

In addition, there was a significant effect of information congeniality ($F_{2, 135} = 6.30, p = .002, \eta_p^2 = .085$) such that participants evaluated partners who sent them congenial information more positively ($M = 6.26, SD = 1.55$) than partners who sent balanced ($M = 5.96, SD = 1.73; p = .002$) and uncongenial ($M = 5.63, SD = 1.90; p = .004$) information; balanced and uncongenial conditions did not differ significantly ($p = .504$).

There was also a marginally significant interaction of partner condition and information congeniality ($F_{2, 135} = 2.72, p = .069, \eta_p^2 = .039$). Participants in the unlikable confederate

condition used the congeniality of the information they received to inform their opinions of their partner ($F_{2, 135} = 5.14, p = .007, \eta_p^2 = .071$): An unlikable partner who allegedly chose mostly congenial information was evaluated more positively ($M = 3.87, SD = 1.78$) than unlikable partners who chose balanced ($M = 2.26, SD = 0.74; p = .003$) or mostly uncongenial ($M = 2.75, SD = 1.03; p = .016$) information; the uncongenial and balanced conditions did not differ significantly ($p = .346$). However, participants with live (and generally likable) partners were not influenced by information congeniality when evaluating their partners ($F_{2, 135} = 1.34, p = .265, \eta_p^2 = .020$). Therefore, like Study 3, results indicate that when participants have a likable partner, the congeniality of information they receive does not influence their partner evaluations.

Gun control consensus. When estimating the percentage of Americans who shared their attitude on gun control, participants were not affected by information congeniality ($F_{2, 134} = 1.84, p = .163$), partners evaluations ($F_{1, 134} = 0.66, p = .418$), or an interaction of the two ($F_{2, 134} = 1.62, p = .203$).

Gun control similarity. When estimating the similarity of their partner's gun control views with their own, participants were again influenced by the information they received, with a significant effect of information congeniality ($F_{2, 134} = 7.10, p = .001, \eta_p^2 = .096$): Participants who received mostly congenial information estimated the greatest similarity between themselves and their partners ($M = 65.40\%, SD = 21.57$), more so than those who received neutral ($M = 53.60\%, SD = 22.00; p = .029$) and mostly uncongenial ($M = 45.08\%, SD = 24.66; p < .001$) information; balanced and uncongenial conditions did not differ significantly ($p = .144$). Participants' partner evaluations also resulted in a significant effect ($F_{1, 134} = 18.03, p < .001, \eta_p^2 = .119$) such that participants perceived more agreement between themselves and more likable partners. There was no significant two-way interaction ($F_{2, 134} = 0.35, p = .702$).

Perceptions of bias. Participants were significantly influenced by information congeniality for measures of the articles' accuracy in representing their own point of view on gun control (like Study 3; $F_{2, 135} = 15.69, p < .001, \eta_p^2 = .189$), multiple points of view on gun control (also like Study 3; $F_{2, 134} = 3.66, p = .028, \eta_p^2 = .052$), and usefulness to oneself ($F_{2, 130} = 3.10, p = .048, \eta_p^2 = .046$), but not for usefulness to all Americans ($F_{2, 127} = 0.38, p = .682$).

For their own opinion on gun control, participants (rightly) felt their views were most accurately represented when they received mostly congenial information ($M = 4.60, SD = 1.33$) compared to mostly uncongenial ($M = 3.04, SD = 1.47; p < .001$) and balanced ($M = 3.72, SD = 1.22; p = .001$) information; the uncongenial and balanced conditions differed significantly ($p = .030$).

For the accuracy in representing multiple points of view, participants who received balanced information rated it as being most representative of multiple points of view on gun control ($M = 5.33, SD = 1.60$) compared to mostly congenial ($M = 4.85, SD = 1.76; p = .177$) and mostly uncongenial ($M = 4.24, SD = 1.79; p = .007$) information. The congenial and uncongenial conditions did not differ significantly ($p = .170$).

For the articles' usefulness to themselves, participants displayed a pattern similar to that for representing multiple points of view: Balanced information was rated as more useful ($M = 4.35, SD = 1.64$) than mostly congenial ($M = 3.67, SD = 0.92; p = .020$) and mostly uncongenial ($M = 3.84, SD = 1.80; p = .096$) information; congenial and uncongenial conditions did not differ significantly ($p = .455$).

Participants' evaluations of their partners also influenced how much they felt articles represented multiple points of view ($F_{1, 134} = 5.46, p = .021, \eta_p^2 = .039$) and were useful to themselves ($F_{1, 130} = 8.06, p = .005, \eta_p^2 = .058$). In each case, participants saw the articles they

received, regardless of congeniality, as being more representative and useful as their evaluations of their partners increased. There were no partner evaluation effects for accurately representing one's point of view ($F_{1, 135} = 2.94, p = .089$) or usefulness to Americans ($F_{1, 127} = 0.49, p = .486$).

Lastly, there were no significant interactions of information congeniality and partner evaluations for any of the four measures.

Box model. Using the box model, participants assessed what factors they believed influenced their partners' alleged information selections for them. The two factors oriented around the participant ("your own beliefs and attitudes," "your personality"; $r = .31, p = .01$) were collapsed into a single "self" factor, and the two factors oriented around the partner ("your partner's beliefs and attitudes," "your partner's personality"; $r = .40, p = .01$) were collapsed into a single "partner" factor. Participants could indicate that their balance of information was received due to "random chance" and "other," in which they wrote in a factor of their own; however, because a minority of participants utilized the "other" option and there was a diversity of factors, it is not included in the following analyses.

Repeated measures ANOVA with three dependent measures (self-related factors, partner-related factors, random chance) found a significant effect of factor type ($F_{1, 135} = 61.43, p < .001, \eta_p^2 = .313$): Participants were more likely to list partner factors ($M = 44.64\%, SD = 23.88$) over self factors ($M = 32.93\%, SD = 22.73; p = .001$) or random chance ($M = 11.33\%, SD = 17.04; p < .001$); self and random factors also differed significantly ($p < .001$).

There was also a significant effect of partner evaluations ($F_{1, 135} = 4.62, p = .033, \eta_p^2 = .033$) indicating that estimations about the influences on their information choice depended on partner evaluations. Participants who rated their partners at one standard deviation below the mean perceived those partners as relying significantly more upon partner-related motives than

self-related motives ($M_{diff} = 18.17, SE = 4.60, p < .001$). However, for participants who evaluated their partner at the mean level of likability, the difference in their estimates of how much their partner relied upon partner and self motives decreased ($M_{diff} = 11.22, SE = 3.20, p = .001$), and this difference decreased even more for those who evaluated their partner one standard deviation above the mean in likability ($M_{diff} = 4.07, SE = 4.53, p = .371$). Thus, as participants liked the alleged selector more, they perceived that selector as considering the participant's attitudes and personality more in their selection decisions.

Discussion

Study 4 expanded on how recipients make judgments about information and selectors as a function of likability and information congeniality. Like Study 3, participants in Study 4 saw congenial (vs. balanced or uncongenial) information as being more hedonically enjoyable and useful. Unlike Study 3, participants in Study 4 varied their evaluations of the selector depending on the congeniality of information they received, but this turned out to be attributable to the new unlikable confederate condition; for participants in the organic RCIT condition, information congeniality did not affect evaluations of the selector (like Study 3). Lastly, participants in Study 4 again saw information as being more representative of multiple points of view—regardless of congeniality—when a likable selector chose it.

The box model results also revealed how participants thought their information environments were shaped. Participants generally estimated that selectors chose information based on their own attitudes and personality, and not those of the recipient. This result matches with Study 2, in which selectors relied upon their own attitudes to choose information, and not those of the recipient. But, likability of the selector also mattered in Study 4. Although assessments of how much selectors relied on “partner” factors or random chance did not differ

by likability, participants' perceptions that their partners utilized "self" factors (i.e., the participant and information recipient) differently depending on likability relates to previous studies in the present research. Although Study 2 participants chose information based on their own gun control attitudes, the likability of the recipient affected the quantity of congenial (or uncongenial) information they chose for the recipient. In Study 4, the box model results indicated that when there is a positive relationship between the selector and recipient, the recipient assumes the selector has specifically thought more about the recipient when making the information choice.

This result also has implications for *de facto* selective exposure: Participants in Study 4 ignored random chance as a possibility for their receipt of information and instead assumed that they were given information precisely because their attributes were taken into account. Despite reporting that their information environment might be tailored to them in specific ways, participants still judged that information to be relatively unbiased, especially when a likable other had chosen it for them.

General Discussion

Across four studies of information selectors and recipients, the present research yielded several conclusions about how people choose information for others, and how recipients evaluate information that was chosen for them. In Studies 1 and 2, participants were chosen information for fictitious recipients, and those recipients varied by their likability. In Study 1, participants chose information about the MEQ, a fictitious intelligence test about which they had no attitude, but their alleged partners did. In this context, participants used the likability of the recipient to guide information selection: Likable recipients received information that was mostly congenial to them, whereas unlikable ones received mostly uncongenial information. Study 2 used gun

control—a topic about which participants had an attitude—and showed the limits of likability: Study 2 selectors generally relied upon their own gun control attitudes to choose information for recipients, but curated especially congenial selections for likable, agreeable recipients. Thus, Studies 1 and 2 found that information selections for others can be strongly influenced by likability—especially for novel issues—but that for familiar topics, alignment of selectors’ and recipients’ attitudes was also important.

Studies 3 and 4 examined information recipients and showed the continued influence of likability from their perspective. Both studies focused on gun control (like Study 2) and found that recipients regarded information as more hedonically enjoyable and useful not just when it was congenial (vs. uncongenial), but also when it came from a likable selector. Study 3 found that participants felt especially positively about selectors with whom they had a more intimate exchange of information (via the RCIT) compared to the more limited exchange with fictitious partners. In these instances when participants strongly liked their partners (the alleged selectors), they regarded information positively regardless of its congeniality. Study 4 replicated this effect among likable interaction partners but found that after interacting with a scripted, unlikable RCIT partner, participants’ evaluations of information depended mostly on its congeniality. Thus, Studies 3 and 4 found that although recipients often found congenial information to be more enjoyable and useful than uncongenial information, this congeniality bias could be attenuated when the information was ostensibly chosen by a highly likable selector.

Asymmetries Between Selectors and Recipients

Across the four studies, patterns of results between selectors and recipients were aligned and misaligned in interesting ways. In Studies 1 and 2, selectors who considered the hedonic experience of their alleged partners chose more congenial (vs. uncongenial) information for

those partners—especially likable partners—but choosing congenial (vs. uncongenial) information was unrelated to considerations of whether the recipient would find the information useful. In other words, when selectors both liked and agreed with the alleged recipient, selectors chose a batch of information that was highly congenial to that recipient. Moreover, selectors chose information that would provide hedonic validation, but not objectivity, for those likable and agreeable recipients. Although these results were consistent with prior research showing that congenial selective exposure is primarily motivated to provide hedonic validation and not necessarily a sense of objectivity (Hart et al., 2009), selectors in Studies 1-2 were only partially correct in predicting recipients' experiences. Indeed, Studies 3 and 4 found that recipients who received more congenial (vs. uncongenial) information found it to be both hedonically enjoyable and useful. Thus, although selectors might have recognized that congenially biased information is more likely to make one feel good than provide a sense of objectivity, recipients did not share this recognition. Recipients saw congenial information as not just hedonically enjoyable but also higher in utility, a (mis)perception that selectors did not share.

Information Environments and *de facto* Selectivity

The present research has implications for *de facto* selective exposure, the factors that produce it, and news consumption in modern information environments. First, the current studies illustrate how information exchange in relational dyads could facilitate *de facto* selective exposure, by which people find themselves in congenial information environments that are not the result of their affirmative choices (Freedman & Sears, 1965). Although Studies 1 and 2 found that selectors only curated congenial information environments for likable recipients for novel—but not familiar—issues, Studies 3 and 4 found that information recipients enjoyed and derived utility from information that came from likable selectors, regardless of congeniality. These four

studies indicate that even without evidence of selectors actively curating congenial information for recipients (as in Study 2), recipients *perceived* their information environments as fulfilling both hedonic and utility needs when they thought that information was curated by highly likable selectors (as in the RCIT participants in Studies 3 and 4). *De facto* selectivity, therefore, could occur by receiving information from likable others, even when that information is on its face not consistent with one's attitudes.

The present studies also address questions that have arisen in light of modern technological changes in how people share and consume information. Indeed, Studies 1 and 2 suggest that fears about homogeneous online “echo chambers” may be exaggerated (Sunstein, 2001). Although Study 1 selectors deferred to the recipient's likability in their selection decisions, Study 2 showed that for divisive political issues that are more likely to elicit discussion and debate, selectors chose information for others that they personally would find validating and mostly did not take the recipient's attitudes into account. Indeed, selectors in Study 2 who had likable but disagreeable partners generally disregarded likability and chose information that those alleged recipients would find uncongenial. But, Studies 3 and 4 showed that this reluctance to cater to recipients' views in Study 2 did not matter when the selector-recipient relationship was positive: When recipients liked the alleged selector, information congeniality no longer mattered.

Thus, to the extent that many online social networks are likely to be based on personal likability—and not necessarily attitudinal similarity—the present studies illustrate that people should not only be exposed to heterogeneous viewpoints, but will evaluate heterogeneous information in an open-minded, perhaps even positive, manner. In this way, the present findings appear consistent with research showing that people engage in considerable cross-ideological

online discussions (Barberá, 2015; Barberá et al., 2015; Diehl et al., 2016; Heatherly et al., 2017) and value information that is endorsed by friendly peers in social networks (Messing & Westwood, 2014; Weeks et al., 2017; Weeks & Holbert, 2013). However, the findings that selectors chose congenial information for recipients when considering their hedonic experience—but not utility—could have a dark side amidst modern concerns about the spread of misinformation and fake journalism (Guess, Nyhan, & Reifler, 2018). If selectors only consider what is hedonically validating for the recipient, that could lead selectors to disseminate misinformation that is validating, but objectively wrong; then, recipients who see information from likable selectors as both enjoyable and useful could be amenable to misinformation.

Limitations and Future Directions

One limitation of the present research is the divide in how information selectors and recipients were studied. Studies 1 and 2—of selectors—were conducted with participants from MTurk, whereas Studies 3 and 4—of recipients—were conducted with university undergraduates. There are differences between these populations, notably age (MTurk participants are older) and political ideology (students are more liberal and Democratic-leaning); but, research suggests that MTurk is superior for studies of political attitudes (Clifford, Jewell, & Waggoner, 2015). Therefore, it is possible that results about selectors or recipients might vary across these populations. Future studies can assess whether these populations differ significantly in information selection and reception patterns, and whether they are differentially affected by factors such as likability and information congeniality.

A second limitation and direction for future research concerns how attitude strength factors might affect the present results. Although we did not examine how participants' selection or reception patterns differed according to how strongly or confidently they felt about the issue at

hand (particularly for gun control), research has found that related attitude strength factors could affect these results. For instance, attitude confidence can affect selective exposure (Hart et al., 2009), attitude certainty can change persuasion intentions (Cheatham & Tormala, 2017; Petrocelli, Tormala, & Rucker, 2007), and the moral conviction of one's attitude can affect willingness to engage with people who disagree on that issue (Skitka, Bauman, & Sargis, 2005; Skitka & Morgan, 2014). Thus, whether these attitude strength constructs affect information selection and reception in relational dyads is deserving of future study.

Finally, how recipients evaluated uncongenial information when it came from a likable selector is noteworthy for theories of attitude change. For instance, Heider's (1958) balance theory suggests that within a positive selector-recipient relationship, if a selector sends information to a recipient that the recipient finds uncongenial, then the recipient should feel motivated to resolve the inconsistency; the recipient would do this by changing their attitude about either the selector or the uncongenial information. In Study 3, recipients with likable, fictitious partners did not resolve the inconsistency: They maintained a positive evaluation of the selector, but a negative evaluation of the information. However, the opposite occurred for participants who had likable RCIT partners in Studies 3-4: These recipients evaluated otherwise uncongenial information favorably.

Conclusion

Across four studies in which participants were assigned to select information for others or receive information that had been selected for them, the present research demonstrated how people in relational dyads exchange information. For novel issues, selectors were attuned to the likability of information recipients, but selectors were more attentive to information congeniality when the topic was attitudinally relevant. However, recipients regarded information increasingly

favorably—in both hedonic experience and utility—as the information selector became more likable, regardless of information congeniality. Thus, the present studies indicate that although information selectors may not actively curate congenial information environments for recipients—particularly when it comes to contentious political issues—recipients are positively oriented toward information coming from likable sources. These findings suggest that *de facto* selectivity may be facilitated by positive relationships, but also that recipients are likely exposed to heterogeneous views as they engage with liked others.

CHAPTER IV

Is Belief Superiority Justified by Superior Knowledge?

Possessing accurate knowledge about oneself is notoriously difficult. Many people maintain inaccurate positive illusions about themselves (Taylor & Brown, 1988), evaluate their own abilities and traits more favorably than others' despite statistical improbabilities (Alicke, 1985), and fail to recognize their own incompetence (Kruger & Dunning, 1999). *Belief superiority*, or the belief that one's own views are more correct than other viewpoints, is another instance in which people privilege something about themselves—their beliefs—over those of other people (Brandt, Evans, & Crawford, 2015; Raimi & Jongman-Sereno, under review; Raimi & Leary, 2014; Tappin & McKay, 2016; Toner, Leary, Asher, & Jongman-Sereno, 2013). However, no research to date has examined whether people who claim this sense of belief superiority are at all accurate or justified in this claim.

Is it possible that this sense of belief superiority is justified? Across psychology and philosophy, beliefs are typically defined as being rooted in a perceived truthful or factual basis (Fishbein, 1963; Fishbein & Raven, 1962; Schwitzgebel, 2015). Thus, for a belief to be superior—or more correct—than other beliefs, it should have a superior basis in relevant factual information. Following this logic, belief-superior individuals should possess more accurate knowledge than their more modest peers, or at least better recognize relevant facts when presented with them. There is a positive relationship between belief superiority and *perceived* knowledge: Raimi and Leary (2014) found that participants who expressed belief superiority about hydraulic fracturing (aka, fracking) considered themselves to be better educated about

energy and gas issues than the average American. But, whether belief-superior individuals are justified in their assessments of enhanced knowledge is still unknown.

Belief Superiority

Belief superiority is a comparative cognition: The belief superior do not just think highly of their own beliefs, but think those beliefs are superior to other views on that topic (Raimi & Jongman-Sereno, under review; Toner et al., 2013). Although belief superiority resembles other types of self-enhancement (for a review, see Leary & Toner, 2012), the object of focus is one's beliefs, rather than positive characteristics about the self (e.g., competence, intelligence, or abilities). Belief superiority has been demonstrated with political beliefs (Brandt et al., 2015; Toner et al., 2013), religious views (Hopkin, Hoyle, & Toner, 2014), environmental issues (Maki & Raimi, 2017; Raimi & Leary, 2014), and more trivial issues such as etiquette (Raimi & Jongman-Sereno, under review). Belief superiority can also be a general psychological tendency that is not confined to a single issue (Raimi & Jongman-Sereno, under review). In each case, the extremity of one's belief—rather than the direction—predicts this sense of possessing beliefs that are superior to alternatives. When it comes to political beliefs—the focus of the present research—belief superiority is a bipartisan problem: Across many political issues, those with more extreme attitudes—regardless of ideology—are more likely to express belief superiority (Toner et al., 2013).

Belief superiority is correlated with various attitude strength constructs, including attitude confidence and certainty (Petrocelli, Tormala, & Rucker, 2007; Raimi & Jongman-Sereno, under review; Rios, DeMarree, & Statzer, 2014), but differs in a critical way: Belief superiority, by definition, is a *relative* comparison to alternative viewpoints, not just an assertion about the strength of one's convictions. Thus, one could be very confident or certain in a belief, but not

necessarily believe it to be superior to other viewpoints; for example, one could be sure that Coca Cola is better than Pepsi, but not begrudge people who hold the opposite view.

Alternatively, one could hold a belief without much confidence but still believe it to be superior to other views, such as a doctor who isn't sure that a particular antibiotic will cure her patient's infection, but believes that it is better than other treatments (Raimi & Jongman-Sereno, under review; Toner et al., 2013). However, the attitude correctness component of attitude certainty resembles belief superiority by similarly appealing to the notion that one's attitude or belief is singularly dominant. Furthermore, the leading measure of attitude correctness includes one item that asks people to compare the "rightness" of their belief to all possible attitudes, thus introducing a relative component to this construct (Petrocelli et al., 2007; Rios et al., 2014). It is unclear whether the inclusion of non-comparative items in the attitude correctness measure makes for a psychological experience that is substantially different than belief superiority's wholly relative wording, but neither construct has been studied in terms of how they relate to gaps in actual and perceived knowledge or information-seeking processes, the goals of the present research.

Belief superiority is also distinct from moral conviction, or a strong belief about whether something is moral or immoral (Skitka, Bauman, & Sargis, 2005). A superior belief can apply just to one circumstance (e.g., "A progressive income tax in the U.S. reduces income inequality"); just because someone expresses belief superiority about one issue or stance does not mean that they ascribe similar superiority to all related beliefs (Raimi & Jongman-Sereno, under review). Conversely, a moral conviction is universal, asserting that a belief not only has objective merit, but that it is grounded in a greater moral truth that should apply universally, rather than just in isolated circumstances (Skitka et al., 2005; Skitka & Morgan, 2014).

Additionally, emotional experience is considered a factor in moral convictions (Skitka et al., 2005; Skitka & Morgan, 2014), but is not part of the definition of belief superiority (Raimi & Leary, 2014; Toner et al., 2013). Belief superiority *could* be motivated by a moral conviction, but could also have an entirely different basis (e.g., a perceived factual basis, the focus of the present research).

In addition to its construct distinctiveness, belief superiority has also been demonstrated to be consequential. For instance, thinking that one's belief is superior to other viewpoints predicts interpersonal strife: People high in belief superiority tend to act in maladaptive ways during relationship conflicts (for example, raising their voices or refusing to admit they were wrong; Raimi & Jongman-Sereno, under review), derogate strangers who hold opposing political views (Raimi & Leary, 2014), and treat conversations as a chance to profess their viewpoints rather than listen (Maki & Raimi, 2017).

But perhaps there is a hidden upside to belief superiority: It may be that people who think their beliefs are superior are actually correct in that self-perception. This would imply that the damage to social relationships from belief superiority might be somewhat offset by a true understanding of the world and a refusal to defer to misguided trends. For example, President Lyndon B. Johnson ignored the vehement opposition of members of his own political party when working toward civil rights legislation in the 1960s. Despite the bad blood that resulted, he considered his beliefs—that no racial group is inherently better or worse than another—to be superior to those of the opposition and believed future historians would approve of his choices (Caro, 2012). Thus, belief superiority could be a result of a superior grasp of belief-relevant issues that guides action in reasonable ways.

The Gap Between Perceived and Actual Knowledge

Although superior beliefs should (ideally) be supported by superior information, there are several reasons belief superiority might exist that have nothing to do with enhanced knowledge. People often exaggerate their own skills or traits, particularly when those traits are socially desirable (Alicke, 1985). Indeed, thinking highly of oneself, even unrealistically, can promote mental health and provide an effective buffer against negative or threatening information about the self (Taylor & Brown, 1988; although see also: Colvin et al., 1995; Robins & Beer, 2001). Expressing superiority about one's views may even have social benefits: Overconfident people are perceived as possessing higher social status (Anderson, Brion, Moore, & Kennedy, 2012). Additionally, research on motivated reasoning—particularly for political issues—suggests that thinking one's beliefs are superior could validate those beliefs and help to resist the negative effects of dissonance when confronted with disagreeable information (Festinger & Maccoby, 1964; Hart et al., 2009; Kunda, 1990). Thus, belief superiority may provide benefits, even without truly superior knowledge.

There are many reasons to doubt the claims by belief-superior people that their views are supported by better information. People are remarkably unaware of their own limitations and errors. For instance, people routinely underestimate their own bias (Pronin, Lin, & Ross, 2002), even when they consciously use biased strategies (Hansen, Gerbasi, Todorov, Kruse, & Pronin, 2014). Furthermore, participants who perform the worst across a variety of metrics exhibit the widest discrepancy between self-assessments of competence and actual performance (e.g., the "Dunning-Kruger effect"; Barnsley et al., 2004; Epley & Dunning, 2000; Kruger & Dunning, 1999). This gap between perceived and actual competence is generally attributed to a lack of metacognitive ability to recognize one's own limitations (e.g., Balcetis & Dunning, 2013); thus, if belief-superior people have inferior knowledge, they may not even be aware of it.

Errors in metacognitive ability may be especially likely when it comes to political issues that people care about deeply. For instance, many people overestimate their ability to provide strong justifications for their views about controversial topics, and this overestimation is even more likely for those who care strongly about that topic or hold extreme views (Fernbach, Rogers, Fox, & Sloman, 2013; Fisher & Keil, 2014). We suspect that the belief superior may exhibit similar deficits when asked to demonstrate superior belief-relevant knowledge.

Belief Superiority and Information Pursuit

Even if belief superiority is not supported by superior knowledge, belief superiority could be justified by another process: superior knowledge acquisition. That is, even if the belief-superior cannot demonstrate a superior grasp of relevant knowledge, they may still seek out information about that topic in an even-handed manner that exposes them to a diversity of viewpoints. As a result, their belief superiority may reflect a reasoned conclusion after comparing multiple viewpoints. Thus, a secondary question in the present research concerns how belief-superior people pursue relevant information. Specifically, the belief superior could engage in three types of information-seeking.

First, belief-superior people may not seek out new information at all out of a perceived lack of need; after all, they already think their beliefs are superior and well-informed. Although possible, this trend is unlikely. Belief superiority is predicted by belief extremity and confidence, constructs that are tied to political engagement (Raimi & Leary, 2014; Skitka & Bauman, 2008; Toner et al., 2013); thus, belief-superior individuals should be more likely to engage with political information, not less.

Second, belief-superior individuals might preferentially seek out information that is congenial to their beliefs, as reading agreeable information feels validating (Hart et al., 2009)

and may help maintain belief superiority. Encountering information relevant to a closely held belief is especially likely to evoke a defensive motivation to validate preexisting beliefs and reject threats to those beliefs; the outcome of such behavior is known as *selective exposure*, or a preference for agreeable (vs. disagreeable) information (Festinger & Maccoby, 1964; Hart et al., 2009). Theoretically relevant constructs, including belief commitment, are associated with greater selective exposure (Hart et al., 2009). Furthermore, existing belief superiority research provides reason to believe that belief superiority is associated with increased selective exposure. Belief-superior people became more certain about their beliefs after reading new information (even if that information was counter-attitudinal), suggesting that they were adept at finding congenial evidence even in uncongenial sources (Raimi & Leary, 2014). Moreover, Maki and Raimi (2017) found that the belief superior reported trying to dominate conversations with people who disagree with them, suggesting a preference for blocking exposure to disagreeable information.

A third possibility is that the belief superior may seek out more disagreeable information. Confidence in one's belief—a consistent positive correlate of belief superiority—tends to predict less selective exposure (Hart et al., 2009), and some highly confident individuals seek out disagreeable information for opportunities to successfully defend their attitudes, a trait known as defensive confidence (Albarracín & Mitchell, 2004). No research has tested the link between belief superiority and defensive confidence, but we feel this third possibility is less likely. Although participants in Raimi and Leary (2014) who expressed belief superiority also expressed a willingness to engage with the author of a disagreeable article, Maki and Raimi (2017) demonstrated that this engagement takes the form of monologues rather than listening to novel

ideas, indicating that the belief superior may not truly enjoy engaging with disagreeable information.

Current Studies

The goals of the present research were fourfold: First, to establish the link between belief superiority and perceiving oneself as knowledgeable with a variety of political issues; second, to test whether the belief superior are overestimating their knowledge; third, to assess how the belief superior seek out new knowledge; and fourth, to examine how the belief superior utilize feedback about their knowledge.

We assessed these questions across six studies. Study 1a served as a pilot to confirm that people perceive their beliefs as factually-based and to validate measures of actual knowledge for use in later studies. Study 1b assessed the relationship between belief superiority, perceived knowledge, and actual knowledge for two political issues. Study 2 examined the link between belief superiority and information-seeking, and Study 3 explored whether the belief superior are self-aware about their information-seeking behavior. Study 4 experimentally manipulated belief superiority to test for causal effects on information-seeking. Finally, Study 5 experimentally manipulated feedback about knowledge to test the subsequent effects on information seeking.

We hypothesized that belief superiority would correlate with overestimating one's knowledge (Studies 1b-5). We also hypothesized that the belief superior would engage in more biased information seeking (selective exposure; Studies 2-5), and that manipulating belief superiority upward (or downward) would lead to increased (or decreased) selective exposure (Study 4).

Study 1a

Study 1a was a pilot study with three goals: 1) to validate our issue-specific knowledge questions with a common measure of general political knowledge; 2) to assess whether people identify their beliefs as based in perceived facts and truth, a key assumption driving the present research; and 3) to examine the relationship between belief superiority and relevant attitude strength measures.

Method

Participants. American adults ($N = 240$) recruited from Amazon's Mechanical Turk (MTurk) participated in exchange for \$1.50. MTurk was chosen for multiple reasons. First, MTurk samples are less likely than traditional (student) psychology samples to cheat on political knowledge tests (Clifford & Jerit, 2016)—one of the primary measures throughout the present research. In addition, despite the overrepresentation of political liberals on MTurk, conservatives on MTurk are dispositionally similar to conservatives in nationally representative samples (e.g., American National Election Study; Clifford, Jewell, & Waggoner, 2015).

Participants who failed either an attention or quality check¹ ($n = 9$) were excluded from analyses, resulting in a final sample of 231 participants (51.5% female; $M_{\text{age}} = 38.2$ years; 58.4% identifying as Democrats). Sample size for Study 1a—and the studies that follow—was determined with an eye toward variance in political ideology; based on prior experiences with MTurk, we estimated that roughly 25-30% of MTurk workers identified as Republican, and we recruited enough participants to achieve our goal of at least 60 Republican participants in each sample or experimental condition (Studies 4-5). Sample size was determined before any data analysis.

Design and procedure. Study 1a was designed to validate measures of beliefs, metacognitions about beliefs, and actual political knowledge for five issues in American politics:

income inequality, the size of the federal government, terrorism, the economy and jobs, and gun control. Each of these issues was chosen for its importance to American voters at the time, according to public polling (Newport, 2016; Swift, 2016). For each issue, participants indicated their agreement with the belief, belief superiority, belief confidence, attitude certainty, and the basis of their belief. Participants also completed political knowledge tests about each issue and a measure of general political knowledge. Participants were randomly assigned to complete this procedure for two out of the five possible issues.

Measures. For belief, belief superiority, belief confidence, and demographics, all studies used the same operationalizations:

Beliefs. For each issue, participants used a 7-point scale (1 = *Strongly disagree*; 7 = *Strongly agree*) to indicate their agreement with a belief statement. The belief statements read: “The federal government should rely on the free market, not tax policy, to distribute income and wealth in society” (income inequality); “The federal government should take active steps in any area or industry it can to try to improve the lives of its citizens” (size of federal government); “The government should take all steps necessary to prevent additional acts of terrorism in the U.S., even if it means that basic civil liberties may be violated” (terrorism); “A robust and active U.S. federal government promotes a healthy economy” (economy/jobs); and, “The U.S. federal government should enact stricter regulations on the purchase, sale, and ownership of firearms” (gun control).

Belief superiority. Participants indicated their level of belief superiority about the belief they had just expressed using a 5-point scale² (1 - *No more correct than other viewpoints*; 2 - *Slightly more correct than other viewpoints*; 3 - *Somewhat more correct than other viewpoints*; 4 - *Much more correct than other viewpoints*; 5 - *Totally correct (mine is the only correct view)*) in

response to the following question: “How much more correct are your views on [issue] than other beliefs about this issue?”

Belief confidence. For each belief statement, participants used a 5-point scale (1 = *Not at all confident*; 5 = *Extremely confident*) to indicate their confidence in that belief.

Demographics. Participants provided their gender, age, and political ideology (1 = *Very liberal*; 7 = *Very conservative*), and completed a forced-choice (Democrat or Republican) political affiliation question.

The following measures of issue-specific knowledge, general political knowledge, basis of beliefs, and certainty were all specific to Study 1a:

Issue-specific knowledge. We drafted a variety of multiple-choice questions—always with one correct answer out of four total options—assessing relevant knowledge for each issue based on websites of expert sources and organizations. Study 1a included between six and nine questions per issue. Participants in all studies were required to pledge not to use outside resources during the knowledge test, in line with recommended anti-cheating precautions (Clifford & Jerit, 2016). See Supplemental Material for full question text.

General political knowledge. We compiled a 15-item, multiple-choice assessment adapted from similar assessments used by political science research and public polling organizations (Delli Carpini & Keeter, 1993; Diehl, Weeks, & Gil de Zuniga, 2015; Newport, Saad, & Traugott, 2015; Pew Research Center, 2015). This assessment tests institutional knowledge about the American political system (e.g., the number of years in a U.S. Senate term) and knowledge of current affairs (e.g., the current Chief Justice of the U.S. Supreme Court). See Supplemental Material for full question text.

Basis of belief. Using a free-response format, participants responded to the question: “Consider how you’ve formed your beliefs about [issue]. Where do those beliefs come from? What are they based on?”

Attitude certainty. Participants completed the attitude certainty scale created by Petrocelli and colleagues (2007) for each issue. This measure assesses two components of certainty: attitude clarity (four items) and correctness (three items) using a 9-point scale (1 = *Not at all*; 9 = *Very much*; Petrocelli et al., 2007). Clarity includes items such as, “How certain are you that you know what your true attitude on [issue] really is?” and correctness includes items such as, “How certain are you that your attitude toward [issue] is the correct attitude to have?”

Results

Validating issue-specific knowledge measures. To construct issue-specific knowledge assessments for use in later studies, we compared participants’ scores on individual issue-specific questions with their scores on the general political knowledge assessment. On average, participants answered 11.30 ($SD = 2.49$) of these 15 general political knowledge questions correctly (average score = 75.30%). We ran bivariate correlations between composite scores of different combinations of issue-specific questions for each issue, with four criteria: first, we looked for composites of at least three questions for each issue; second, we looked for issue-specific composites that correlated at least $r = .30$ with general political knowledge—the lower bound of a medium correlation (Cohen, 1988); third, we looked for knowledge composites that were not strongly correlated with belief, such that people on one side of the issue did not score differently than those on the other side; and fourth, we looked for a fairly normal distribution of scores.

These analyses resulted in knowledge assessments for four of the five issues. We were unable to construct an adequate assessment composite for terrorism, so terrorism was excluded in the following analyses and not included in later studies. For income inequality, we constructed two assessments of varying lengths: a three-item version ($r = .48$, $M_{\text{score}} = 43.12\%$) and a seven-item version ($r = .52$, $M_{\text{score}} = 47.83\%$). We also constructed three-item assessments each for size of federal government ($r = .54$, $M_{\text{score}} = 50.53\%$), economy and jobs ($r = .35$, $M_{\text{score}} = 54.17\%$), and gun control ($r = .30$, $M_{\text{score}} = 38.89\%$).

Last, we verified that beliefs about each issue were not strongly correlated with these issue-specific or general political knowledge measures. For issue-specific knowledge, income inequality belief was weakly correlated with the seven-item income inequality knowledge assessment ($r = -.23$, $p = .025$), with higher scores for those with more conservative beliefs. For general political knowledge, size of federal government belief was weakly correlated with knowledge ($r = -.22$, $p = .032$), with higher scores among those with more liberal beliefs. No other correlations between beliefs and either issue-specific or general political knowledge were significant.

Basis of beliefs. Next, we assessed whether participants reported basing their beliefs on facts. Two independent coders evaluated participants' free responses to the basis of belief question for each issue and assigned each response to one of seven categories: 1) Facts, truths, empiricism, or the perceived true state of the world; 2) Morals or personal values; 3) Religion or spirituality; 4) Experts or credible sources; 5) Membership in a political group; 6) Membership in a non-political group; 7) Other, none of the above, or blank. The coders exhibited substantial interrater reliability ($\kappa_{\text{Response 1}} = .75$; $\kappa_{\text{Response 2}} = .68$), and differences were reconciled by a third coder.

Collapsing across topics, participants cited facts as the basis of their beliefs a majority of the time (58.5%); this pattern did not differ by issue (income inequality, 62.0%; size of federal government, 50.5%; economy, 65.9%; gun control, 56.0%). Morals/values was the second-most cited basis (19.7%), followed by experts/credible sources (13.1%). Each of the other categories was cited in less than 3% of cases. Across all issues, we created dummy-coded variables to signify whether beliefs were based on facts (vs. all other categories), morals (vs. all other categories), and experts (vs. all other categories), as these were the most-cited categories. Binary logistic regressions found that belief superiority was unrelated to both the facts and morals dichotomous outcomes (facts: $B = 0.09$, $SE = 0.09$, Wald $\chi^2 = 0.96$, $p = .328$, $\beta = 1.10$, 95% CI [0.91, 1.31]; morals: $B = 0.15$, $SE = 0.12$, Wald $\chi^2 = 1.61$, $p = .204$, $\beta = 1.16$, 95% CI [0.92, 1.45]). However, people who expressed greater belief superiority were less likely to cite experts as the basis for that belief ($B = -0.40$, $SE = 0.14$, Wald $\chi^2 = 7.61$, $p = .006$, $\beta = 0.67$, 95% CI [0.51, 0.89]). This trend is consistent with the definition of belief superiority: If the belief superior think that they are already experts, then they should not need to rely on outside expertise to inform their beliefs.

Correlates of belief superiority. For each issue, we ran bivariate correlations between belief superiority, belief confidence, attitude clarity, and attitude correctness. Clarity and correctness represented mean composites of the four clarity and three correctness items, respectively (all α s > .92). For all issues, expressing belief superiority was significantly correlated with belief confidence (r s range: .42 - .50; all p s < .001). The belief superior also reported more attitude clarity (r s range: .32 - .50; all p s < .01) and correctness (r s range: .50 - .58; all p s < .001) for each issue. Lastly, belief confidence was highly correlated with both clarity (r s range: .62 - .79; all p s < .001) and correctness (r s range: .59 - .73; all p s < .001). Full

correlation tables are available in Supplemental Material, as are analyses of the associations between belief superiority and perceived knowledge, actual knowledge, and basis of beliefs, controlling for attitude correctness. Controlling for attitude correctness did not change the pattern of results between belief superiority and actual knowledge nor the bases of beliefs, but it did cause some relationships between belief superiority and perceived knowledge to go from significant to marginal. Thus, some of the correlation between belief superiority and perceived knowledge does seem to be tied to thinking one's attitudes are correct (rather than just more correct than others).

Discussion

Study 1a laid a foundation for studying the relationship between belief superiority and knowledge. Based on Study 1a and previous research (Raimi & Leary, 2014), we know that the belief superior claim to be knowledgeable and that people generally claim to have fact-based beliefs. If this had not been the case—for example, if people claimed their beliefs were rooted primarily in morals—then it would not be logical to question whether the belief superior have superior knowledge. But, because people—including the belief superior—*do* claim to have fact-based beliefs, we believe it is fair to assess their grasp of relevant knowledge.

Further, the finding that the belief superior are no more likely to claim that their beliefs are based on moral values supports the theoretical distinction between belief superiority and moral conviction. We acknowledge that people are sometimes unaware of the moral underpinnings of their judgments (e.g., Haidt, Björklund, & Murphy, 2000; Royzman, Kim, & Leeman, 2015), yet we believe the current study provides compelling evidence for a distinction between belief superiority and morally driven beliefs. The basis of participants' beliefs was determined by free-response coding that took an inclusive view of a moral-based rationale for a

belief, and not with a scale measure that would rely more on conscious access to moral reasoning. A response did not need to explicitly mention “morals” or a specific moral concept (e.g., “fairness” or “loyalty”) to be classified as a “moral or personal value”; instead, these responses often indicated value-driven beliefs without explicit moral language (e.g., “It’s just a common decency.”). In addition, very few responses were unclassifiable (< 3%), indicating that unlike participants in moral dumbfounding situations (Haidt et al., 2000), few participants experienced an inability to describe the basis for their beliefs.

Furthermore, Study 1a showed that although belief superiority is correlated with other measures that seem similar on their face—attitude certainty and belief confidence—they are not identical to these measures (maximum $r = .58$). This is perhaps best understood in light of previous research showing extremely high correlations ($r = .96$) between belief superiority (measured as a relative correctness response) and belief superiority measures that ask participants how much more “superior” or “better” their beliefs are (Raimi & Leary, 2014). Thus, although related to certainty and confidence, belief superiority is a distinct construct. Because belief confidence was strongly correlated with both attitude clarity and correctness for each issue, and because it is a more parsimonious measure than the attitude certainty measure, we included only belief confidence in subsequent studies.

Finally, Study 1a helped us construct issue-specific knowledge assessments for four political issues for use in later studies. In Study 1b, we examined whether the belief superior can justifiably claim to have a superior grasp on belief-relevant knowledge.

Study 1b

Method

Participants. American adults ($N = 313$) were recruited from MTurk for \$1.00. Participants who dropped out ($n = 25$) or failed either the attention or quality checks ($n = 27$) were excluded from analyses, resulting in a final sample of 261 participants (53.3% female, $M_{age} = 37.9$ years, 72% Democrats).

Design and procedure. Study 1 used a correlational design to examine the relationship between belief superiority and knowledge. Study 1b utilized two political issues validated in Study 1a: income inequality and size of the federal government.

Participants were first asked about their beliefs, belief confidence, and belief superiority for both issues (with issues presented in a random order). Next, participants reported their perceived knowledge and the average American's knowledge on both issues before their actual knowledge of both topics was measured, using assessments validated in Study 1a. Lastly, participants provided demographic information.

Measures. For both issues, measures of belief, belief confidence, and belief superiority were the same as in Study 1a. The following measures were also included:

Perceived knowledge. Using a 5-point scale (1 = *Not at all knowledgeable*; 5 = *Extremely knowledgeable*), participants rated their own degree of knowledge and the average American's degree of knowledge for both issues.

Actual knowledge. Participants completed the 3-item knowledge quizzes for each issue that were constructed in Study 1a. The order of the issue quizzes was randomized.

Results

Descriptive statistics for all variables in Studies 1b-5 are available in Table 6.

Table 6

Descriptive Statistics of Predictor and Outcome Variables, Studies 1b-5

Variable	Study 1b (IQ)		Study 1b (SFG)		Study 2 (EJ)		Scale Range
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Belief	3.82	1.87	5.03	1.60	5.18	1.40	1-7
Belief confidence	3.61	1.09	3.57	1.01	3.18	0.98	1-5
Belief superiority	2.90	1.27	2.35	1.20	2.10	1.09	1-5
Perceived own-knowledge	3.10	0.97	2.73	0.98	2.65	0.80	1-5
Actual knowledge (%)	42.78	30.03	52.62	32.27	54.09	28.10	0-100
Total headlines	-	-	-	-	2.82	2.30	0-8
Agreeable headlines	-	-	-	-	1.42	1.30	0-4
Disagreeable headlines	-	-	-	-	1.47	1.35	0-4
Congeniality bias	-	-	-	-	-0.05	1.34	-4-4
Variable	Study 3 (IQ)		Study 4 (IQ)		Study 5 (GC)		Scale Range
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Belief	3.96	1.79	4.48	1.88	5.16	2.04	1-7
Belief confidence	2.92	0.96	-	-	4.08	1.03	1-5
Belief superiority	1.95	0.98	2.29	1.23	2.94	1.29	1-5
Perceived own-knowledge	2.57	0.82	2.70	0.82	3.06	0.91	1-5
Actual knowledge (%)	40.24	19.26	48.50	20.33	45.02	29.48	0-100
Total headlines	4.02	2.87	6.29	2.27	4.94	2.89	0-10
Agreeable headlines	2.22	1.80	3.35	1.45	2.91	1.67	0-5
Disagreeable headlines	1.87	1.68	2.96	1.49	2.08	1.68	0-5
Congeniality bias	0.35	2.03	0.39	1.85	0.83	1.75	-5-5

Note. Actual knowledge for each issue reflects the percentage of multiple-choice questions answered correctly out of the total possible correct on the knowledge quiz. Issue abbreviations are as follows: income inequality (IQ); size of federal government (SFG); economy/jobs (EJ); and gun control (GC). Congeniality bias reflects the difference score of the number of agreeable headlines chosen minus the number of disagreeable headlines chosen.

Perceived knowledge. We first examined the relationship between expressing belief superiority and perceptions of knowledge, both for oneself and the average American (see Table 7). Linear regressions found that belief superiority significantly predicted greater perceived own-knowledge for both issues, but did not predict perceptions of the average American’s knowledge. Thus, perceiving one’s beliefs as superior was linked to a greater sense of one’s own knowledge, but not a diminishment of others’ knowledge.

Table 7
Effect of Belief Superiority on Perceived Knowledge, Studies 1b-5

Study (issue)	DV	<i>B</i>	<i>SE b</i>	β	<i>sr</i> ²	<i>p</i>
1b (IQ)	Own-knowledge	0.37	0.04	0.49	.24	< .001
	Average American knowledge	0.02	0.04	0.03	.00	.674
1b (SFG)	Own-knowledge	0.49	0.04	0.60	.36	< .001
	Average American knowledge	0.05	0.04	0.08	.01	.229
2 (EJ)	Own-knowledge	0.33	0.03	0.46	.21	< .001
	Average American knowledge	0.06	0.04	0.09	.01	.105
3 (IQ)	Own-knowledge	0.28	0.05	0.33	.11	< .001
	Average American knowledge	0.09	0.04	0.15	.02	.012
	Those who agree knowledge	0.22	0.04	0.28	.08	< .001
	Those who disagree knowledge	-0.04	0.05	-0.05	.00	.420
4 (IQ)	Own-knowledge	0.27	0.03	0.40	.16	< .001
5 (GC)	Own-knowledge	0.30	0.03	0.43	.18	< .001
	Average American knowledge	0.01	0.03	0.02	.00	.677
	Those who agree knowledge	0.21	0.03	0.34	.11	< .001
	Those who disagree knowledge	-0.16	0.03	-0.23	.05	< .001

Note. Issue abbreviations are as follows: income inequality (IQ); size of federal government (SFG); economy/jobs (EJ); and gun control (GC). Study 4 did not include a measure of belief confidence.

Knowledge gap. We next examined the relationship between belief superiority and the gap between perceived and actual knowledge. For Study 1b and the studies that follow, we constructed a knowledge gap measure by standardizing the perceived own-knowledge and actual knowledge measures (i.e., the number of correctly answered questions on each knowledge quiz), and then subtracting actual knowledge from perceived own-knowledge.

A hierarchical linear regression (HLR; Step 1: belief superiority; Step 2: belief confidence) found that belief superiority was significantly associated with a larger knowledge gap for both political issues (see Figure 7), even when controlling for confidence (see Table 8). Thus, the belief superior were more likely to overestimate their knowledge about both income inequality and the size of the federal government.

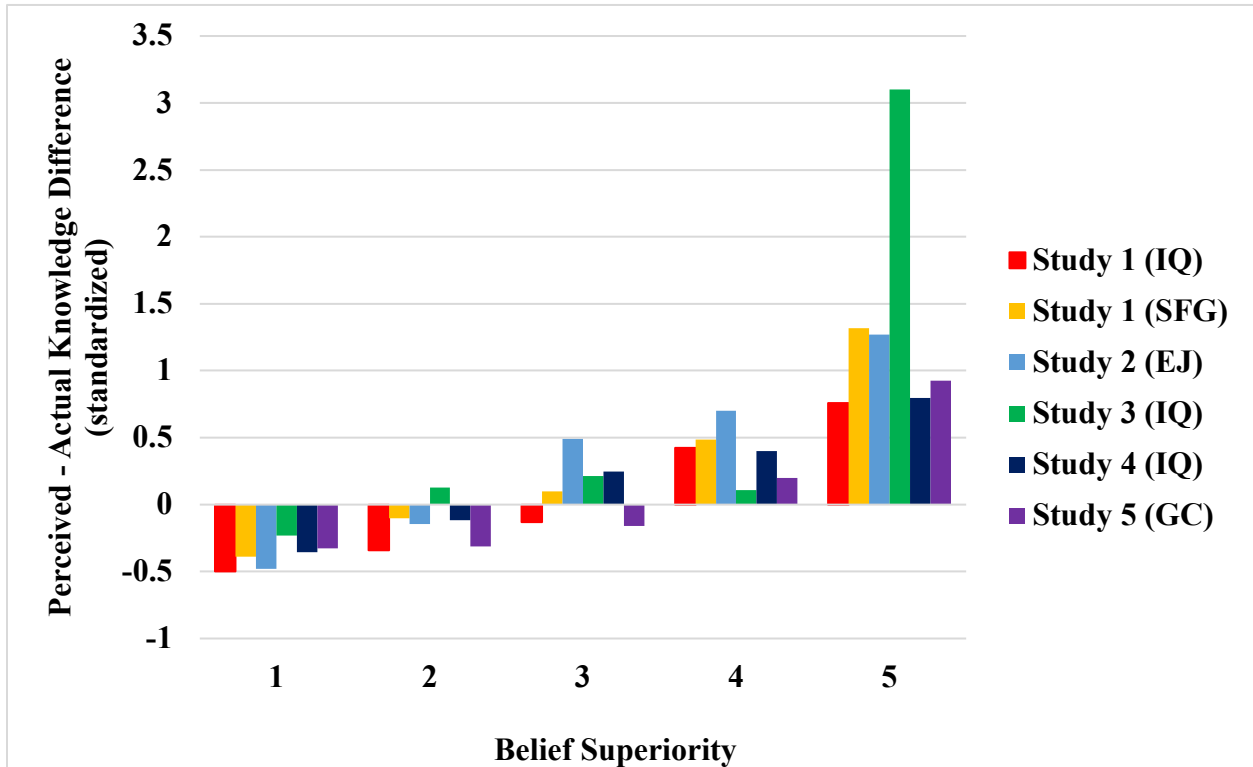


Figure 7. The degree of mismatch between perceived and actual knowledge by study and issue. The knowledge gap is a difference score of the standardized measures of perceived own-knowledge and actual knowledge (positive scores indicate overestimation of knowledge, negative scores indicate underestimation). Issue abbreviations are as follows: income inequality (IQ); size of federal government (SFG); economy/jobs (EJ); and gun control (GC). For Study 3, only one participant endorsed the highest belief superiority response option (5).

Table 8

Effect of Belief Superiority on Knowledge Gap, Studies 1b-5

Study (issue)	Model and predictor	<i>B</i>	<i>SE b</i>	β	<i>sr</i> ²	<i>p</i>
1b (IQ)	<i>Model 1:</i>					
	Belief superiority	0.32	0.06	0.32	.10	< .001
	<i>Model 2:</i>					
	Belief superiority	0.24	0.06	0.24	.06	< .001
	Belief confidence	0.25	0.07	0.22	.05	< .001
1b (SFG)	<i>Model 1:</i>					
	Belief superiority	0.32	0.06	0.33	.11	< .001
	<i>Model 2:</i>					
	Belief superiority	0.25	0.06	0.26	.06	< .001
	Belief confidence	0.20	0.07	0.18	.03	.005
2 (EJ)	<i>Model 1:</i>					
	Belief superiority	0.44	0.06	0.37	.13	< .001
	<i>Model 2:</i>					
	Belief superiority	0.37	0.06	0.30	.09	< .001
	Belief confidence	0.24	0.07	0.18	.03	< .001
3 (IQ)	<i>Model 1:</i>					
	Belief superiority	0.22	0.07	0.17	.03	.004
	<i>Model 2:</i>					
	Belief superiority	0.06	0.07	0.05	.00	.425
	Belief confidence	0.47	0.08	0.36	.12	< .001
4 (IQ)	<i>Model 1:</i>					
	Belief superiority	0.28	0.04	0.25	.06	< .001
5 (GC)	<i>Model 1:</i>					
	Belief superiority	0.26	0.04	0.26	.07	< .001
	<i>Model 2:</i>					
	Belief superiority	0.21	0.05	0.20	.03	< .001
	Belief confidence	0.14	0.06	0.11	.01	.026

Note. Issue abbreviations are as follows: income inequality (IQ); size of federal government (SFG); economy/jobs (EJ); and gun control (GC). Model 2 including belief confidence as a control; Study 4 did not include a measure of belief confidence.

Discussion

Study 1b assessed a primary question driving the present research: Do the belief superior possess superior knowledge? We found that for both political issues in Study 1b, belief-superior people were more likely to overestimate their perceived issue-specific knowledge relative to their

actual knowledge as measured on a short quiz. Thus, Study 1b established that although people expressing higher levels of belief superiority considered themselves better informed about that issue, they were not necessarily accurate in this perception.

In light of this result, Study 2 examined how the belief superior pursue relevant knowledge, including whether that pursuit plays out in a biased manner. Although the belief superior may not possess superior knowledge, they may still engage in fair-minded knowledge acquisition, which may fuel their belief superiority. However, because belief superiority is associated with tendencies to avoid disagreeable information (Maki & Raimi, 2017), we expected that the belief superior would be more likely to engage in selective exposure. Logically, those who hold superior beliefs (or believe they do) should not bother to seek out opposing arguments, which, by definition, advocate for inferior views. Those low in belief superiority, however, should attend to a range of opinions, given that they see those views as equally valid compared to their own.

Study 2

Method

Participants. Participants were 427 American adults recruited from MTurk for \$1.50. Participants who did not finish the survey ($n = 23$) or failed either the attention or quality checks ($n = 41$) were excluded from analyses, resulting in a final sample of 363 participants (44.4% female, $M_{age} = 35.9$ years, 68.6% Democrat).

Design and procedure. Like Study 1b, Study 2 examined the relationship between belief superiority and knowledge. Study 2 expanded upon Study 1b by also measuring participants' pursuit of new information, and whether this pursuit displays a congeniality bias (Hart et al., 2009). We focused on just one issue for Study 2: the American economy.

Participants largely followed a similar procedure in Study 2 as in Study 1b: They completed measures of beliefs, belief confidence, belief superiority, perceived knowledge, and actual knowledge. After the knowledge quiz, participants completed a selective exposure task.

Measures. The structure of all belief, belief confidence, belief superiority, and perceived knowledge measures in Study 2 were the same as those in previous studies.

Actual knowledge. The knowledge quiz used in Study 2 was comprised of three multiple-choice questions validated in Study 1a.

Headline selection. Participants saw eight article headlines evenly split between supporting or opposing the belief that “an active, robust U.S. federal government promotes a healthy economy.” Headlines were derived from real news articles; we lightly edited some headlines to clarify their stance on federal government intervention in the U.S. economy. Participants saw all headlines at once, arranged in alternating order of stance, and chose which articles (if any) they wanted to read at the end of the study, up to the full list of eight. Headlines for Studies 2-5 are shown in the Supplemental Material.

Results

Perceived knowledge. Like in Study 1b, linear regressions indicated that belief superiority predicted greater perception of one’s own knowledge, but not perceived knowledge of the average American (Table 7).

Knowledge gap. An HLR again found that belief superiority was associated with a significantly larger gap between perceived and actual knowledge (see Figure 7), even when controlling for confidence (see Table 8).

Headline selection. To analyze whether participants selected information in a biased manner, we categorized people according to their belief about the American economy.

Individuals on either side of the scale midpoint (4) were categorized as either against (scores < 4, $n = 51$) or in favor of active federal government in the economy (scores > 4, $n = 275$). For the participants in these groups, headlines were categorized as “agreeable” or “disagreeable” to their preexisting belief, an analytic strategy consistent with previous literature (Brock & Balloun, 1967; Hart et al., 2009). Participants who reported a neutral belief (i.e., score = 4, $n = 37$) were excluded from these analyses because congeniality under this condition is ambiguous. Thus, headline selection analyses are based on a sample of 326 participants. For all headline analyses, we used HLRs with two predictors: belief superiority (Step 1) and belief confidence (Step 2), which has a known relationship with selective exposure outcomes (Hart et al., 2009). See Tables 4 and 5 for headline selection analyses. Including confidence in the models did not change any of the belief superiority results described below.

Participants selected 2.88 out of 8 headlines on average ($SD = 2.29$). First, an HLR tested the effects of belief superiority on the total number of headlines chosen. Belief superiority was associated with choosing more information to read in total.

Next, we examined the effects of these factors on participants’ degree of congeniality bias (Hart et al., 2009). We constructed a congeniality bias score by subtracting the number of disagreeable headlines chosen from the number of agreeable headlines chosen; positive numbers indicate a preference for congenial information (a congeniality bias), and negative numbers indicate a preference for uncongenial information. An HLR of belief superiority on overall congeniality bias found no relationship.

We then decomposed the overall congeniality bias to separately examine belief superiority’s associations with approaching agreeable information or avoiding disagreeable information (for more on this approach, see Garrett & Stroud, 2014). HLRs found significant

positive associations between belief superiority and both the number of agreeable and disagreeable headlines selected.

Table 9

Effect of Belief Superiority on Total Headlines Chosen and Congeniality Bias with Controls, Studies 2-5

Study (issue)	Model and predictor	Total headlines					Congeniality bias				
		<i>B</i>	<i>SE b</i>	β	<i>sr</i> ²	<i>p</i>	<i>B</i>	<i>SE b</i>	β	<i>sr</i> ²	<i>p</i>
2 (EJ)	<i>Model 1:</i>										
	Belief superiority	0.38	0.11	0.18	.03	< .001	0.10	0.07	0.08	.01	.143
	<i>Model 2:</i>										
	Belief superiority	0.36	0.12	0.17	.02	.002	0.05	0.07	0.05	.00	.455
	Belief confidence	0.09	0.13	0.04	.00	.500	0.14	0.08	0.10	.01	.099
3 (IQ)	<i>Model 1:</i>										
	Belief superiority	0.06	0.14	0.03	.00	.669	0.42	0.11	0.23	.05	< .001
	<i>Model 2:</i>										
	Belief superiority	-0.01	0.14	0.00	.00	.970	0.38	0.12	0.20	.04	.001
	Belief confidence	0.19	0.15	0.08	.01	.192	0.12	0.12	0.06	.00	.299
4 (IQ)	<i>Model 1:</i>										
	Belief superiority	0.02	0.10	0.01	.00	.847	0.24	0.06	0.17	.03	< .001
5 (GC)	<i>Model 1:</i>										
	Belief superiority	0.43	0.10	0.19	.04	< .001	0.53	0.07	0.33	.11	< .001
	<i>Model 2:</i>										
	Belief superiority	0.39	0.11	0.18	.02	.000	0.42	0.08	0.26	.05	< .001
	Belief confidence	0.10	0.14	0.04	.00	.464	0.31	0.10	0.15	.02	.002

Note. Issue abbreviations are as follows: income inequality (IQ); size of federal government (SFG); economy/jobs (EJ); and gun control (GC). Congeniality bias reflects the difference score of the number of agreeable headlines chosen minus the number of disagreeable headlines chosen. Study 4 did not include a measure of belief confidence.

Table 10

Effect of Belief Superiority on Agreeable and Disagreeable Headlines Chosen with Controls, Studies 2-5

Study (issue)	Model and predictor	Agreeable headlines					Disagreeable headlines				
		<i>B</i>	<i>SE b</i>	β	<i>sr</i> ²	<i>p</i>	<i>B</i>	<i>SE b</i>	β	<i>sr</i> ²	<i>p</i>
2 (EJ)	<i>Model 1:</i>										
	Belief superiority	0.25	0.06	0.21	0.04	< .001	0.15	0.07	0.12	0.02	.027
	<i>Model 2:</i>										
	Belief superiority	0.21	0.07	0.18	0.03	.003	0.15	0.07	0.13	0.01	.036
	Belief confidence	0.13	0.08	0.10	0.01	.106	-0.01	0.08	-0.01	0.00	.912
3 (IQ)	<i>Model 1:</i>										
	Belief superiority	0.23	0.09	0.16	0.02	.009	-0.19	0.09	-0.13	0.02	.030
	<i>Model 2:</i>										
	Belief superiority	0.17	0.09	0.12	0.01	.061	-0.21	0.09	-0.14	0.02	.027
	Belief confidence	0.17	0.09	0.12	0.01	.065	0.05	0.10	0.03	0.00	.607
4 (IQ)	<i>Model 1:</i>										
	Belief superiority	0.14	0.06	0.10	0.01	.019	-0.10	0.06	-0.08	0.01	.079
5 (GC)	<i>Model 1:</i>										
	Belief superiority	0.45	0.06	0.32	0.10	< .001	-0.08	0.06	-0.06	0.00	.188
	<i>Model 2:</i>										
	Belief superiority	0.39	0.07	0.28	0.06	< .001	-0.03	0.07	-0.02	0.00	.673
	Belief confidence	0.17	0.09	0.10	0.01	.049	-0.13	0.09	-0.08	0.00	.133

Note. Issue abbreviations are as follows: income inequality (IQ); size of federal government (SFG); economy/jobs (EJ); and gun control (GC). Study 4 did not include a measure of belief confidence.

Discussion

Study 2 again found that although belief-superior individuals perceived themselves as highly knowledgeable, they significantly overestimated their level of issue-specific knowledge. Study 2 also found that those high in belief superiority pursued more information overall, but did not display the hypothesized preference for agreeable over disagreeable information; instead, belief superiority was positively associated with seeking out more agreeable *and* disagreeable information. One possibility for this lack of congeniality bias could be that the issue topic of Study 2—the American economy and jobs—was not divisive enough to induce the expected motivated reasoning processes that would lead to active avoidance of disagreeable information. Indeed, contemporaneous polling showed that Americans of all partisan stripes said that this issue was important to them, suggesting a possible lack of division over this particular issue (Newport, 2016).

Building on these results, Study 3 examined selective exposure for a different political issue and assessed whether the belief superior have better metacognitive knowledge of their informational choices.

Study 3

Study 3 had two objectives. First, we examined the relationship between belief superiority and selective exposure using a different issue (income inequality). Second, we assessed whether belief superiority is related to accuracy about the nature of one's information choices. Because belief-superior participants in Study 2 sought out more information overall, perhaps their superiority derived from the (correct) perception that they are seeking out more information sources than other people.

Method

Participants. Participants from the psychology subject pool at a large public Midwestern university participated for course credit ($N = 370$). This subject pool was chosen for generalizability outside of the MTurk population. Participants who did not finish the survey ($n = 2$) or failed either an attention or quality check ($n = 73$)³ were excluded from analyses (final sample: $N = 295$, 64.7% female, $M_{age} = 18.5$ years, 70.8% Democrat).

Design and procedure. Study 3 followed a similar design to Study 2: Participants indicated their belief (about income inequality), belief confidence, belief superiority, and perceived knowledge for themselves and the average American. Next, participants completed the knowledge quiz; because student samples are more likely to cheat on political knowledge assessments (Clifford & Jerit, 2016), experimenters unobtrusively monitored for any Internet browsing during the study. Next, participants engaged in a selective exposure paradigm similar to Study 2. Study 3 also included three new measures: 1) two questions assessing perceived knowledge of those who agree and disagree with the participant's income inequality belief; 2) a question after the headline selection task assessing participants' perceptions of the degree of bias in their information choices; and 3) a scale measuring defensive confidence, a trait-like tendency to show a reduced congeniality bias and actively seek out disagreeable information out of confidence in one's beliefs (Albarracín & Mitchell, 2004). Lastly, participants completed demographic measures.

Measures. The structure of all belief confidence, belief superiority, perceived own-knowledge, perceived knowledge of the average American, and demographic measures were the same as in prior studies, but focused on income inequality. For the headline selection task, Study 3 expanded to 10 headlines (5 supporting the belief statement, 5 opposed). Lastly, Study 3 used

the 7-item multiple-choice quiz on income inequality derived from Study 1a. Lastly, the following measures were added:

Belief. Study 3 operationalized income inequality belief differently from Study 1b based on pilot testing with the subject population of Study 3. The belief statement asked participants to indicate their agreement (same 7-point scale) with the following statement: “To address income inequality, there should be a guaranteed basic income for all citizens.”

Perceived knowledge. Study 3 included two additional measures of perceived knowledge. Using the same response options as the other perceived knowledge measures, participants rated the knowledgeability of the “average person who *agrees* with you on this issue” and the “average person who *disagrees* with you on this issue.”

Perceived headline selection bias. After the headline selection task, participants were asked, “Think about the headlines that you marked you wanted to read, versus those that you declined to read. Which of the following answer options best describes your choices of headlines, in total?” Participants could choose one of five answer options: 1) “*I chose only headlines that did not support my beliefs*”; 2) “*I chose more headlines that did not support my beliefs than headlines that supported my beliefs*”; 3) “*I chose an even balance of headlines that supported my beliefs and those that did not support my beliefs*”; 4) “*I chose more headlines that supported my beliefs than headlines that did not support my beliefs*”; or 5) “*I chose only headlines that supported my beliefs*.”

Defensive confidence. The defensive confidence scale (Albarracín & Mitchell, 2004) consisted of 12 statements about confidence in defending one’s ideas and views ($\alpha = .87$; four items are reverse-coded), with responses on a 5-point scale (1 = *Not at all characteristic of me*; 5 = *Extremely characteristic of me*).

Results

Perceived knowledge. Like in prior studies, those high in belief superiority were significantly more likely to perceive themselves as knowledgeable (Table 7). Unlike the previous studies, belief superiority also positively predicted perceptions of the average American's knowledge. Additional regressions found that belief superiority was associated with perceiving those who agree as knowledgeable, but had no association with the perceived knowledge of those who disagree (Table 7). Thus, the belief superior appear to boost the perceived knowledge of oneself and similar others, but not to the detriment of everyone else.

Knowledge gap. An HLR with belief superiority (Step 1) and belief confidence (Step 2) as predictors found a significant association between belief superiority and the knowledge gap (see Figure 7). However, this effect disappeared when belief confidence was included in the model (see Table 8).

Headline selection. Like in Study 2, headlines were categorized as “agreeable” or “disagreeable” in the context of one's income inequality belief; participants with neutral beliefs ($n = 11$) were excluded from headline selection and defensive confidence analyses. These analyses were based on the remaining 284 participants who either favored ($n = 145$) or opposed ($n = 139$) reducing income inequality with a universal basic income. Like in Study 2, each of the following analyses represents an HLR with belief superiority in Step 1 and belief confidence in Step 2 (Tables 9-10).

Participants selected an average of 6.30 ($SD = 2.28$) headlines out of 10. Belief superiority was unrelated to the total number of headlines chosen. Next, an HLR on congeniality bias—the difference between the number of agreeable and disagreeable headlines chosen—found

a significant effect of belief superiority, indicating that, unlike in Study 2, the belief superior showed a stronger congeniality bias. This effect persisted when controlling for confidence.

Further HLRs tested divergence in the selection of agreeable and disagreeable headlines. Like in Study 2, belief superiority was significantly associated with increased selection of agreeable headlines, which became marginal when confidence was included in the model. Unlike in Study 2, belief superiority in Study 3 was associated with decreased selection of disagreeable headlines, which remained with confidence in the model. Thus, belief superiority was again associated with approaching agreeable information, and was also associated with avoiding disagreeable information.

Perceived headline selection bias. Next, we tested whether participants were aware of this congeniality bias. An HLR of belief superiority (Step 1), congeniality bias (Step 2), and the interaction of the two (Step 3) on participants' perceptions of their degree of bias in their headline selections yielded a significant effect of belief superiority ($B = 0.12$, $SE = 0.04$, $t(280) = 3.12$, $p = .002$, $R^2_{change} = .03$), which remained when controlling for congeniality bias ($B = 0.08$, $SE = 0.04$, $t(279) = 2.13$, $p = .034$, $sr^2 = .01$). In addition, the interaction of the two was significant ($B = 0.06$, $SE = 0.02$, $t(278) = 3.30$, $p = .001$, $sr^2 = .04$). Simple slope tests showed that this interaction was driven by those who exhibited a stronger congeniality bias, who were more likely to (accurately) state that their headline choices were biased when they were high in belief superiority ($B = 0.18$, $SE = 0.05$, $t = 3.77$, $p < .001$). The estimates of those exhibiting low ($B = 0.06$, $SE = 0.04$, $t = 1.69$, $p = .092$) and mean levels ($B = 0.05$, $SE = 0.06$, $t = 0.98$, $p = .327$) of congeniality bias did not differ by belief superiority.

Defensive confidence. An HLR of belief superiority (Step 1) and belief confidence (Step 2) on defensive confidence indicated that belief superiority was not predictive of differences in

defensive confidence ($B = 0.36$, $SE = 0.44$, $t(277) = 0.82$, $p = .414$, $R^2_{change} = .00$), which remained non-significant when controlling for confidence in Step 2 ($B = -0.27$, $SE = 0.46$, $t(276) = -0.59$, $p = .554$, $sr^2 = .00$). However, confidence was predictive of defensive confidence in Step 2 ($B = 1.92$, $SE = 0.46$, $t(276) = 4.14$, $p < .001$, $sr^2 = .06$). Together with the selective exposure results—in which belief superiority was associated with choosing *fewer* disagreeable headlines, not more—this result suggests that belief superiority is not accompanied by self-confidence about defending one’s beliefs from disagreeable information.

Discussion

Study 3 again demonstrated that belief-superior people perceive themselves as being more knowledgeable, and that this enhancement is not limited to the self: Other people who agree with one’s superior belief are seen as knowledgeable, too. Belief superiority was again related to a larger gap between perceived and actual knowledge.

Study 3 also found a relationship between belief superiority and biased knowledge acquisition. Unlike Study 2, belief superiority was not associated with a greater informational appetite in Study 3, but it was associated with choosing more agreeable information and less disagreeable information. Furthermore, the belief superior recognized that their information seeking was biased, ruling out the possibility that their perception of superior knowledge is due to their focus on their overall information seeking and being blind to their own selection biases.

In Study 4, we addressed a potential explanation for the link between belief superiority and biased information seeking: Perhaps the belief superior knowingly seek more agreeable information because they feel that they are already knowledgeable, therefore giving them a license to pursue information that is biased in their favor. Therefore, Study 4 provided feedback

about the knowledge associated with one's views to challenge this perception of superior knowledge, and then examined the effects on belief superiority and information seeking.

Study 4

Study 4 was an experiment designed to test two questions: First, whether belief superiority could be successfully manipulated; and second, whether a successful manipulation affected participants' information-seeking behavior. The experimental manipulation took the form of feedback about the relative knowledge of people who agreed with the participant. Providing feedback is a common and valued practice, and the underlying assumption is that feedback enables the receiver to use it for self-improvement. For example, giving people a chance to discover the superficiality of their knowledge or learn more about other people's knowledge can lead them to moderate the extremity of their beliefs and their degree of overconfidence (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995; Fernbach et al., 2013). Given that the belief superior in Study 3 extended their superior status to those who agreed with them, we hypothesized that giving participants feedback about the knowledge of issue compatriots and opponents could affect assessments of their own belief superiority.

By experimentally manipulating belief superiority, Study 4 allowed us to assess causality between belief superiority and selective exposure; we hypothesized that increasing (decreasing) belief superiority would lead to more (less) biased information seeking. Study 4 also included a fixed-choice measure of basis of beliefs to explore whether a successful manipulation of belief superiority affected subsequent claims about the basis of one's belief. In prior research, people's attitudes about the death penalty did not change even when they were informed of the factual inaccuracy of their allegedly fact-based beliefs; instead, people subsequently endorsed many bases in support of their views, not all of which were based in reason (Ellsworth & Ross, 1983).

Similarly, we were interested in whether a threat to belief superiority might lead people to endorse non-factual belief bases.

Method

Participants. American adults ($N = 619$) participated via MTurk for \$1.00. Those who did not finish the study ($n = 14$) or failed checks ($n = 18$) were excluded from analyses (final sample: $N = 587$, 52.5% female, $M_{\text{age}} = 37.4$ years, 58.9% Democrat).

Design and procedure. Participants in Study 4 completed an experimental manipulation designed to manipulate belief superiority. We adapted the manipulation from one designed to alter participants' feelings of attitude correctness, a sub-component of attitude certainty that is correlated with belief superiority (Study 1a; Cheatham & Tormala, 2015; Rios et al., 2014). In that research, the researchers manipulated the consensus around a specific attitude to bolster (or reduce) participants' sense of holding a correct attitude. Given that belief superiority is tied to relative (vs. absolute) correctness, we modified this paradigm so that participants were given feedback about how other study participants sharing similar views with them had performed on a knowledge assessment. Thus, some participants were given evidence supporting a perception of their beliefs as superior to alternatives, while others were given information challenging this perception.

After participants reported their belief (using the income inequality measure as in Study 3), they were randomly assigned to one of three conditions: high-belief-superiority, low-belief-superiority, or control. We first reminded participants of their response to the initial belief measure: "You indicated that when it comes to the issue of income inequality in the U.S., you [believe that there should be a guaranteed basic income / believe that there should not be a guaranteed basic income / reported being neutral about whether there should be a guaranteed

basic income].” The instructions continued by informing participants that they would be taking “a short knowledge assessment a little later in the survey” which had already been taken by “hundreds of other participants”. The last sentence of the instructions conveyed the experimental manipulation. Those in the high-belief-superiority condition read: “Of the hundreds of participants who have taken our previous studies, those who reported a similar belief to yours about guaranteed basic income in the U.S. received an average score of **89.73%** on the knowledge assessments.” For those in the low-belief-superiority condition, this figure was 10.63%; both figures were the same as those used in the manipulations in the prior attitude certainty research (Petrocelli et al., 2007; Rios et al., 2014). Participants in the control condition received no information about other participants.

After the experimental manipulation, all participants reported belief superiority and perceived own-knowledge before proceeding to the selective exposure task. Lastly, participants took the 7-item version of the income inequality knowledge assessment, indicated the bases for their income inequality belief, and reported demographics.

Measures. All measures of belief, belief superiority, perceived own-knowledge, and demographics were the same as those used in previous studies. The selective exposure task and knowledge assessment were the same as those used in Study 3. Belief confidence and perceptions of others’ knowledge were not included in Study 4 for the sake of brevity. Study 4 also included the following:

Basis of belief. To assess whether participants’ stated basis of their income inequality beliefs differed from the belief superiority manipulation, the final measure of Study 4 read: “Consider how you’ve formed your beliefs about income inequality. To what extent are those beliefs based on the following items:” 1) facts and the true state of the world; 2) my moral

values; 3) my religious or spiritual values; and 4) experts and/or credible sources. Response options ranged from 1 (*Not at all*) to 7 (*Very much*). These four categories were the most frequently reported in the Study 1a basis-of-belief free responses.

Results

Before analyzing results, we tested for differential attrition between experimental conditions (Zhou & Fishbach, 2016) and for differing levels of baseline knowledge. Analyses of variance (ANOVAs) found no difference between conditions in drop-out rates ($F_{2, 610} = 0.78, p = .459, \eta^2 = 0.00$), the total number of people excluded for dropping out or failing attention or quality checks ($F_{2, 610} = 2.23, p = .109, \eta^2 = 0.01$), or income inequality knowledge ($F_{2, 584} = 2.07, p = .128$).

We next analyzed the relationships between belief superiority, perceived knowledge, and actual knowledge.

Perceived knowledge and knowledge gap. As before, belief superiority was significantly associated with increased perceived knowledge (Table 7). Also replicating previous studies, the belief superior overestimated their own knowledge more than their more modest peers (Figure 7; Table 8).

Belief superiority manipulation. An ANOVA assessing whether the belief superiority manipulations were successful found a marginally significant omnibus effect, $F_{2, 584} = 2.46, p = .086, \eta^2 = 0.01$. Pairwise comparisons indicated that those in the low-belief-superiority condition ($M = 2.13, SD = 1.14$) reported significantly lower belief superiority than those in the control condition ($M = 2.38, SD = 1.27, p = .043, 95\% \text{ CI } [-0.49, -0.01]$) and marginally lower than those in the high-belief-superiority condition ($M = 2.36, SD = 1.26, p = .074, 95\% \text{ CI } [-0.47, 0.02]$). Thus, the manipulation successfully decreased belief superiority, although the statistical

equivalence of the control and high-belief-superiority conditions ($p = .823$, 95% CI [-0.27, 0.22]) indicated that the manipulation failed to increase belief superiority.

Headline selection. Like in prior studies, the headline selection analyses excluded participants who indicated neutral agreement with the belief statement at the beginning of the study ($n = 54$). Therefore, headline selection analyses utilize the remaining 533 participants. Details of all following results are available in Tables 9-10.

On average, participants selected 4.99 ($SD = 2.85$) headlines out of 10. ANOVAs found no effects of condition on total number of headlines chosen ($F_{2, 530} = 0.11$, $p = .896$) or overall congeniality bias ($F_{2, 530} = 0.78$, $p = .457$); no pairwise comparisons were significant in either analysis. Furthermore, condition did not affect the number of agreeable ($F_{2, 530} = 0.04$, $p = .958$) or disagreeable ($F_{2, 530} = 0.55$, $p = .580$) headlines chosen. As in Study 3, belief superiority was unrelated to total headlines chosen, but did predict the congeniality bias. Also replicating Study 3, belief superiority was again associated with choosing more agreeable and fewer disagreeable articles.

We next tested whether the experimental conditions indirectly influenced congeniality bias via belief superiority. We used the PROCESS macro for SPSS (Version 2.12, Model 4, 10,000 bootstrap samples; Hayes, 2013) to test for indirect effects of condition on congeniality bias, with belief superiority as the mediator. To test each condition separately, we created dummy codes for each experimental condition (using the control condition as the reference group) and used one as the predictor and the other as a covariate control in each mediation analysis. Full results are shown in Table 11.

Table 11

Results for Mediation Analyses of Effects of Condition on Congeniality Bias Through Belief Superiority (Hayes Model 4), Study 4

Direct Predictors of Belief Superiority						
Predictor	<i>Coeff.</i>	<i>SE</i>	<i>t</i>	95% CI		<i>R</i> ²
				Lower	Upper	
Low-BS Condition	-0.33	0.13	-2.46*	-0.59	-0.07	0.01
High-BS Condition	-0.07	0.13	-0.52	-0.33	0.19	
All Conditions	0.13	0.07	1.90 [†]	0.00	0.26	
Intercept	2.44	0.09	26.52***	2.26	2.62	

Direct Predictors of Congeniality Bias						
Predictor/mediator	<i>Coeff.</i>	<i>SE</i>	<i>t</i>	95% CI		<i>R</i> ²
				Lower	Upper	
Low-BS Condition	-0.08	0.19	-0.41	-0.44	0.29	0.03
High-BS Condition	0.1	0.18	0.53	-0.26	0.45	
All Conditions	0.09	0.09	0.93	-0.10	0.27	
Belief Superiority	0.24	0.06	3.86***	0.11	0.35	
Intercept	0.28	0.2	1.43	-0.10	0.66	

Indirect Effects on Congeniality Bias					
Predictor/mediator	<i>Coeff.</i>	<i>SE</i>	95% bias-corrected CI		
			Lower	Upper	
Low-BS Condition	-0.08*	0.04	-0.17	-0.02	
High-BS Condition	-0.02	0.03	-0.09	0.05	
All Conditions	0.03	0.02	0.00	0.07	

Note: [†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

All conditions refers to a different way of running Model 4 that treats condition as a 3-level categorical predictor (rather than dummy codes for low and high BS conditions) and tests the effects of both experimental conditions against the control.

Consistent with previous findings that the low-belief-superiority manipulation successfully reduced belief superiority, we found a significant indirect effect of the low-belief-superiority condition on congeniality bias via belief superiority. Specifically, the low-belief-superiority condition lowered belief superiority, which was significantly associated with congeniality bias. The direct effect between low-belief-superiority condition and congeniality bias was not significant.

However, no indirect effect was observed for the high-belief-superiority condition, due to the lack of significant association between high-belief-superiority condition and belief superiority. The direct effect of high-belief-superiority condition on congeniality bias was also not significant. Thus, although we did not successfully increase belief superiority via our manipulation, we did successfully decrease it, which in turn affected information seeking: Participants in the low-belief-superiority condition expressed less belief superiority, and thus decreased their degree of selective exposure.

Basis of belief. Lastly, ANOVAs of condition on the four belief basis categories found significant effects of condition on fact-based beliefs ($F_{2, 584} = 9.94, p < .001, \eta^2 = 0.03$) and expert-based beliefs ($F_{2, 584} = 5.63, p = .004, \eta^2 = 0.02$), but not for morality-based beliefs ($F_{2, 584} = 0.59, p = .555$) or religion-based beliefs ($F_{2, 584} = 0.37, p = .693$). For “facts” and “experts”, the pattern was the same: Those in the low-belief-superiority condition expressed less agreement with these categories ($M_{\text{facts}} = 4.47, SD_{\text{facts}} = 1.44; M_{\text{experts}} = 4.19, SD_{\text{experts}} = 1.51$) than those in the high-belief-superiority ($M_{\text{facts}} = 5.02, SD_{\text{facts}} = 1.46; M_{\text{experts}} = 4.38, SD_{\text{experts}} = 1.54$) and control ($M_{\text{facts}} = 5.03, SD_{\text{facts}} = 1.34; M_{\text{experts}} = 4.69, SD_{\text{experts}} = 1.43$) conditions. For “facts”, low-belief-superiority participants were significantly lower than both high-belief-superiority ($p < .001, 95\% \text{ CI } [-0.83, -0.27]$) and control ($p < .001, 95\% \text{ CI } [-0.84, -0.28]$) conditions. For

“experts”, low-belief-superiority participants were significantly lower than those in the control condition ($p = .001$, 95% CI [-0.79, -0.20]), but not from those in the high-belief-superiority condition ($p = .204$, 95% CI [-0.49, 0.11]).

Discussion

The goal of Study 4 was to experimentally manipulate belief superiority to assess a causal relationship between belief superiority and biased information seeking. Previously observed relationships between belief superiority and biased information seeking—congeniality bias, increased agreeable information intake, and decreased disagreeable information intake—replicated Study 3. However, the belief superiority manipulation was only somewhat successful: Although participants in the low-belief-superiority condition reported the lowest belief superiority, the high-belief-superiority manipulation did not successfully elevate belief superiority compared to control. We suspect that the high-belief-superiority condition did not differ significantly from the control condition because ingroup bias leads to a baseline assumption that like-minded thinkers are also knowledgeable (Tajfel & Turner, 1986); thus, it would not be particularly surprising to learn that one’s ingroup holds this positive trait. Conversely, a manipulation that challenged this default notion (in the low-belief-superiority condition) was more successful and had downstream effects: we observed a significant mediational effect of the low-belief-superiority condition on congeniality. Specifically, those in the low-belief-superiority condition expressed less belief superiority and accordingly engaged in less selective exposure.

Another effect of the low-belief-superiority manipulation was the reported basis of beliefs: Participants in this condition were least likely to endorse “facts” or “experts” as the bases of their income inequality beliefs, indicating that the manipulation led these participants to

distance themselves from these more empirically-grounded categories. However, participants in the low-belief-superiority condition did not shift their belief bases to non-empirical sources, such as morals or religious values. In this way, the low-belief-superiority condition seemed to temper their views—like the participants in Fernbach et al. (2013) asked to explain their opinions in depth—instead of searching for any suitable basis for their belief, as the results of Ellsworth and Ross (1983) might suggest. In addition, the fact that participants in the low-belief-superiority condition shifted their belief basis for facts, but not for morals, further indicates that belief superiority is conceptually distinct from relevant moral constructs (e.g., moral conviction). However, because the present manipulation specifically targeted factual knowledgeability, the possibility remains that a manipulation targeting moral standing could have led to a shift in moral basis of beliefs.

Study 5

The primary goal of Study 5 was to replicate the association between belief superiority and selective exposure (observed in Studies 3-4) with a new issue: gun control (Swift, 2016). Study 5 also explored whether individualized feedback about one’s knowledge might moderate the relationship between belief superiority and information seeking. Study 4 found mixed evidence for a group-level feedback (i.e., the knowledgeability of people who share one’s belief); Study 5 provided feedback by informing some participants of their own knowledge assessment score. Because belief superiority is measured in an individualized way (e.g., “*mine* is the only correct view”), we suspected that providing individual-level feedback about one’s knowledge could successfully change belief superiority even more effectively than feedback about people who share one’s views. Given that the low-belief-superiority condition in Study 4 led to reduced selective exposure, we expected a similar effect for those in Study 5 who received poor feedback

about their knowledge. Conversely, we expected participants who received positive feedback about their knowledge to exhibit a boost in belief superiority, thereby increasing their subsequent selective exposure bias. As in Studies 2-4, all participants engaged in a knowledge assessment and selective exposure paradigm, but we manipulated the order and presence of feedback in Study 5.

Method

Participants. American adults ($N = 604$) were recruited on MTurk for \$1.00. Those who did not finish the survey ($n = 21$) or failed checks ($n = 44$) were excluded from analyses (final sample: $N = 539$, 45.3% female, $M_{age} = 34.7$ years, 67.6% Democrat).

Design and procedure. In addition to measuring the relationship between belief superiority, knowledge, and information pursuit, participants in Study 5 were randomly assigned to one of three experimental conditions. In two conditions, participants took the knowledge assessment before the selective exposure task: Half of these participants received feedback about their knowledge before moving on to selective exposure (feedback condition), and others took the assessment without receiving feedback (no-feedback condition, much like Studies 2-3). In the feedback condition, participants were shown which questions they answered incorrectly (if any) and their overall score. In a third (control) condition, participants did the selective exposure task before the knowledge quiz (without any feedback afterward); this condition allowed for us to know whether having one's knowledge assessed influenced subsequent information-seeking behavior.

Measures. The structure of all belief, belief confidence, belief superiority, perceived knowledge, and demographic measures in Study 5 were the same as prior studies, except that they were about gun control. For the headline selection task, Study 5 used 10 headlines, similar

to Study 4. Lastly, Study 5 used a 3-item multiple-choice quiz on gun control derived from Study 1a.

Results

ANOVAs showed no differences by condition in drop-out rate ($F_{2, 601} = 0.83, p = .436, \eta^2 = 0.00$) or the total number of people excluded from the analysis ($F_{2, 601} = 0.32, p = .729, \eta^2 = 0.00$). In addition, an ANOVA indicated no effect of experimental condition on the knowledge measure ($F_{2, 536} = 1.18, p = .308, \eta^2 = 0.00$). Thus, random assignment was successful and participants' quiz scores were not affected by the order of the knowledge quiz and headline selection task.

Perceived knowledge. Linear regressions (Table 7) found that belief superiority significantly predicted perceived own-knowledge, but not perceived knowledge of the average American. Furthermore, belief superiority significantly predicted increased perceived knowledge of those who agreed with the participant and decreased knowledge of those who disagreed.

Knowledge gap. An HLR of belief superiority (Step 1) and belief confidence (Step 2) on the perceived-actual knowledge difference found a significant effect of belief superiority in both models (see Figure 7 and Table 8). Thus, Study 4 again found that higher belief superiority is associated with an inaccurately inflated sense of one's knowledge.

Headline selection. Those who endorsed a neutral belief ($n = 27$) were excluded from headline analyses. The following analyses are based on the remaining 512 participants who were either in favor of ($n = 385$) or opposed to ($n = 127$) gun control. Like Studies 2-4, each of the following analyses represents an HLR with belief superiority (Step 1) and belief confidence (Step 2). See Tables 9-10.

Participants selected an average of 4.09 headlines ($SD = 2.83$) out of 10. First, an HLR found that belief superiority was significantly associated with choosing more headlines to read in total. Further HLRs tested overall congeniality bias and divergence in selection of agreeable and disagreeable headlines. Belief superiority was significantly associated with stronger congeniality bias and an increased selection of agreeable headlines. However, belief superiority was unrelated to the number of disagreeable headlines chosen. Including belief confidence did not change the pattern of any of these results.

Effect of condition. To investigate the effect of experimental condition on selective exposure, we dummy coded the experimental conditions using the control condition (in which the quiz was taken after the selective exposure task) as the reference group. Next, we ran seven-step HLRs to assess the effects of experimental condition, actual knowledge, belief superiority, and all interactions on selective exposure behavior (see Supplementary Materials Tables 8-11 in Appendix II). However, there were no significant main effects or interactions involving any experimental conditions. Thus, feedback about one's knowledge (or an assessment without feedback) did not moderate the association between belief superiority and selective exposure.

Discussion

In Study 5, we again found that those higher in belief superiority exhibited a greater congeniality bias with a new issue (gun control). Like Studies 2-4, the belief superior chose significantly more agreeable headlines, but unlike Studies 3-4, belief superiority was unrelated to the number of disagreeable headlines chosen. Nonetheless, a strong congeniality bias emerged among the belief superior.

In addition, Study 5 found that providing individualized knowledge feedback was ineffective: Participants across three experimental conditions behaved no differently as a result

of being tested before selecting headlines (or vice versa), or receiving feedback on their knowledge. This discrepancy between the semi-successful effects of group feedback in Study 4 and the failure of individual feedback in Study 5 is perhaps not surprising. Meta-analytic research suggests that the effects of feedback on subsequent behavior or performance are mixed (Kluger & DeNisi, 1996). For example, Kruger and Dunning (1999) found that their most unskilled participants did not incorporate feedback about their relative performance. People also routinely avoid incorporating corrective information into their political beliefs (Gaines, Kuklinski, Quirk, Peyton, & Verkuilen, 2007; Nisbet, Cooper, & Garrett, 2015; Nyhan & Reifler, 2015; Nyhan, Reifler, & Ubel, 2013). Thus, the relationships between belief superiority, knowledge, and congeniality bias appear to be robust in the face of individualized feedback. Yet group feedback in Study 4 (i.e., information about the knowledge of belief in-group members) may be a gateway to successfully reducing belief superiority and its informational consequences.

General Discussion

The present research investigated whether people who express belief superiority can justify it with superior knowledge. Across six studies, we found little evidence to support that claim. First, despite the belief superior perceiving themselves as especially knowledgeable, these perceptions were consistently found to be overestimations (Studies 1b-5). Second, and with the exception of Study 2, we found that belief-superior people were most likely to exhibit a preference for information that supported their preexisting views (Studies 3-5). Seeking out a balanced informational diet of both agreeable and disagreeable information could plausibly justify belief superiority because one could argue that one's belief superiority was determined after careful consideration of relevant information. However, we found little evidence that the belief superior pursued all types of information equally, making this justification less plausible.

Moreover, those high in belief superiority were aware of their biased information-seeking behavior (Study 3).

Lastly, Studies 4 and 5 found mixed success for experimentally manipulating belief superiority. In Study 4, a manipulation based on group-level knowledge feedback succeeded in lowering belief superiority and affecting downstream information seeking and self-reported basing of beliefs on factual knowledge, but the manipulation failed to increase belief superiority. Individualized knowledge feedback in Study 5 had no discernible effects on participants' information-seeking behavior, perhaps indicating that this feedback was not internalized. Thus, the group-level knowledge feedback in Study 4 showed more promise than the individualized feedback in Study 5, although it found only partial success.

Superior Beliefs, but Not Superior Knowledge

We are not the first to demonstrate a gap between self-perceptions and actual performance, with a notable example being the “unskilled and unaware” participants in Kruger and Dunning’s (1999, p. 1121) studies who did not accurately perceive their own shortcomings. It also resembles findings that people who claim expertise on a subject are more likely to claim knowledge of information they could not possibly possess (Atir, Rosenzweig, & Dunning, 2015). The present research sheds light onto who is most likely to display this gap: those who believe their views are superior. Except for in Study 3, this overestimation by the belief superior remained even when controlling for their confidence: this suggests that the relative component of thinking one’s views are better than others’ contributes to the knowledge gap. Given that these belief-superior participants sought out mostly congenial information, our results suggest that the belief superior are not only the least likely to recognize their own knowledge shortcomings, but also the least likely to remedy them. On the other end of the belief superiority spectrum, the most

modest participants in our studies (i.e., those who identified as low in belief superiority) extended this modesty to their perceived knowledgeability by consistently underestimating their issue-specific knowledge (Figure 7). This finding has similarities with Dunning-Kruger effect research (e.g., Kruger & Dunning, 1999)—which found that the most competent participants often underestimated their ability.

In addition to addressing *who* is particularly like to make such over-or underestimations (based on their level of belief superiority), the present research expands upon such findings by exploring objective knowledge about political issues, rather than impossible knowledge (Atir et al., 2015) or peer comparison (Kruger & Dunning, 1999). Expanding this line of inquiry into political issues is important because of how easily one can perpetuate an illusionary sense of superiority with biased political information. Unlike topics such as grammar (Kruger & Dunning, 1999) or financial literacy (Atir et al., 2015), political beliefs do not have largely agreed-upon, objective answers and are therefore more vulnerable to the insidious effects of seeking out only facts that confirm one's preferences. In addition, the present research demonstrates that the resulting knowledge gap among the belief superior is perpetuated by consciously biased information searches, not just a failure to recognize one's own ignorance.

Whether similar associations between belief superiority and information seeking occur in other subjective domains is worthy of exploration. Although belief superiority has been demonstrated in a variety of other domains (including religion, environmental issues, and etiquette; Hopkin et al., 2014; Maki & Raimi, 2017; Raimi & Jongman-Sereno, 2018; Raimi & Leary, 2014) it is unclear whether belief superiority is associated with perceived and actual knowledge gaps and selective exposure in such domains.

Although we found that belief-superior people were most likely to be inaccurate in self-assessments of their knowledge about the specific issues tested here, our results do not speak to the overall intellectual abilities among the belief superior. Indeed, people with more extreme views on certain topics (such as climate change) often have objectively superior abilities in scientific literacy and numeracy (Kahan et al., 2012). Because belief extremity predicts belief superiority, it is certainly possible that belief-superior people are also higher in these general abilities, even without having enhanced knowledge about the topics they feel superior about. However, other research shows a different relationship between reasoning and belief extremity, instead finding that the linear direction (not extremity) of beliefs predicted climate change literacy (Guy, Kashima, Walker, & O'Neill, 2014). In our data, additional analyses found that the relationships between belief direction, belief extremity, and actual knowledge are mixed and vary considerably across issues (see Supplementary Table 12 in Appendix II). Thus, whereas the current research sheds some light into the relationship between belief superiority and knowledge assessments, the nature of the relationship between knowledge and belief extremity is less clear.

Belief Superiority and Consciously Imbalanced Knowledge Acquisition

Belief-superior participants were more likely to engage in selective exposure, typically showing a preference for agreeable over disagreeable information. This congeniality bias in information selection is consistent with prior findings in which the belief superior preferred a one-way approach of imparting knowledge on others, but without necessarily listening to alternative viewpoints (Maki & Raimi, 2017). Moreover, we found that belief-superior participants were quite aware of the extent of their congeniality bias, perhaps indicating that the belief superior perceive consuming one-sided, agreeable information to be a more effective method of gaining knowledge than a balanced information diet.

The results of Study 4—in which experimental manipulations successfully decreased belief superiority, leading to less biased information seeking—suggest that the tendency for biased information pursuit among the belief superior does not primarily serve as a self-enhancement mechanism. Selective exposure validates one’s beliefs, which should make one feel better (Hart et al., 2009). Therefore, if the belief superior sought out information biased in favor of their views primarily to make themselves feel good, then decreasing belief superiority should have *increased* selective exposure, not decreased it.

Instead, these results suggest that selective exposure is not an unconscious self-protective process by which the belief superior maintain their self-esteem, but rather a conscious choice that may be perfectly rational. If people genuinely believe their views are superior, it does not make sense for them to attend to inferior alternative arguments. Thus, the belief superior may be prone to believe that information biased in their favor actually represents a superior strategy of gaining relevant knowledge. In contrast, when people are low in belief superiority (either naturally or due to experimental manipulation), listening to alternative beliefs—which may be as valid or even more valid than their own—could suddenly seem useful. The results of Study 3, in which participants were self-aware about the degree of bias in their informational choices, support this possibility.

Furthermore, we found a divergence in pursuits of agreeable versus disagreeable information, confirming the conclusion of Garrett and Stroud (2014) that only examining overall congeniality biases misses nuances in selective exposure. Belief superiority was consistently associated with approaching more agreeable information, but not always with avoidance of disagreeable information. Indeed, only Study 3 found that belief superiority was significantly negatively associated with seeking out disagreeable information, whereas this relationship was

either reduced or reversed in Studies 2, 4, and 5. In Study 2, this approach of disagreeable information wiped out the congeniality bias found in the other studies. These inconsistent findings for disagreeable information seeking could have occurred for several reasons. Participants in Study 2 could have sought out additional disagreeable information—along with agreeable—to familiarize themselves with uncongenial arguments to more successfully counter-argue them in the future (McGuire & Papageorgis, 1961). Or, perhaps the issue topic makes a difference, such that more divisive or politically contentious topics lead people to avoid disagreeable information in ways that other topics do not. Nonetheless, this lack of consistent avoidance for disagreeable information parallels the finding that belief-superior individuals are quite willing to engage in discussions about the topics they feel superior about, even with issue opponents (Raimi & Leary, 2014). The belief superior do not shy away from controversy or from situations in which other views might be shared, but they also do not engage in the kind of open-minded dialogue or knowledge gathering that is likely to moderate their favored beliefs.

This resistance to outside perspectives may also make the belief superior resistant to feedback challenging their knowledge. Study 4 found some success in altering participants' perceptions of the knowledgeability of like-minded others—with the implication that they too lack superior knowledge—but Study 5 was unsuccessful in altering information-seeking behavior with individual feedback. Despite the individualized nature of the belief superiority construct, perhaps the partial success of Study 4 (and lack of success of Study 5) indicates that one's sense of belief superiority is somewhat derived from being part of a group of like-minded others that has reached correct conclusions about an issue. But, as evidenced by the unsuccessful high-belief-superiority manipulation Study 4, this may be a default assumption that is more responsive to challenges than affirmations.

However, participants in Study 5—even those who received negative feedback about their knowledge—were not influenced by the individual-level feedback, which could have occurred for multiple reasons. Perhaps Study 5 participants did not perceive their assessment score as a valid indicator of their knowledge, and therefore declined to adjust their behavior accordingly; a poor individual knowledge score could be a fluke, whereas the deficient knowledge of one’s entire attitudinal ingroup (as in Study 4) may be harder to dismiss. And given that belief-superior participants also believe their knowledge to be superior, they may be motivated to reject the (perceived) inferior facts presented by researchers (Lewandowsky & Oberauer, 2016). Finally, individualized negative information may feel more threatening than negative information about a larger ingroup, thereby leading people to defensively reject this feedback.

Overall, even the successful low-belief-superiority had a modest statistical effect; taken together, Studies 4 and 5 largely suggest that belief superiority is difficult to influence. However, other methods of providing feedback to belief-superior individuals could induce greater self-reflection: When individuals are asked to provide in-depth explanations of policies they claim to be knowledgeable about and find themselves unable to do so, they are more likely to moderate their attitudes about that policy (Fernbach et al., 2013). This Socratic approach to feedback may be particularly useful for the belief superior due to their tendency to rely more heavily on their own inferences than those provided by outsiders (Brandt et al., 2015). Future research should assess whether discovering that they lack superior knowledge for themselves may be a more effective feedback method.

Future Directions and Limitations

One limitation is the correlational nature of many of our findings. Although the present studies uncovered a variety of tendencies and behaviors correlated with belief superiority—including the gap between perceived and actual knowledge, biased information pursuit, and resistance to feedback about one’s actual knowledge—our Study 4 data did shed some light on the causal sequence of these phenomena. However, this study was only successful in decreasing belief superiority; future research should also address methods of increasing belief superiority. Our data also do not shed light on how people arrive at their belief superiority in the first place, a process that could be effectively addressed by future longitudinal research.

Furthermore, we cannot completely disentangle the personal from the social elements of our manipulation in Study 4; telling people that their attitudinal compatriots are ill-informed could make them feel self-conscious about how researchers see them, leading them to behave differently because of an awareness of being judged, and not due to improved metacognitive awareness (Leary, Raimi, Jongman-Sereno, & Diebels, 2015). Because we cannot account for those participants’ true reasons for changing their behavior, future research could address whether the belief superior have a different conception of how to become better informed about an issue.

An additional question concerns the extent to which belief superiority is related to moral strength constructs, such as moral conviction. The present studies demonstrated that participants were far more likely to cite a factual (vs. moral) basis for their beliefs (Study 1a), that belief superiority was unrelated to morality-based reasons for beliefs (Study 1a), and that manipulating belief superiority affected participants’ likelihood of ascribing a factual (but not moral) basis for their beliefs (Study 4). Nonetheless, many beliefs are likely characterized by both belief superiority and moral conviction; indeed, classifying a belief as moral is not equivalent to

possessing moral conviction (Skitka & Morgan, 2014). Thus, the interplay of these two constructs deserves future study.

Future research may also address whether attitude correctness is associated with similar gaps between perceived and actual knowledge and increased selective exposure as belief superiority. Some existing research has already investigated similar consequences of each construct—though mostly separately—and indicates some similarities, as well as some differences. For instance, attitude correctness is associated with increased resistance to persuasive attacks (Petrocelli et al., 2007), which is similar to findings in the present research (Studies 4 and 5) that belief superiority was often resistant to negative feedback, but different from the inconsistent evidence we found of the belief superior avoiding disagreeable information (Studies 2-5). Thus, the similar or distinct consequences of belief superiority and attitude correctness is clearly a ripe arena for future research.

A final question is whether the belief superior are *misinformed* or *uninformed* (Kuklinski, Quirk, Schwieder, & Rich, 1998). People can be misinformed and possess faulty information, or they can be uninformed and not know any relevant information at all. Because we used multiple-choice questions to assess knowledge in the present studies, we could not distinguish this difference; someone might choose the wrong answer because he erroneously believes it to be true, or because he has no idea what the right answer is and takes a guess. Biased consumption of political media—such as the congeniality bias exhibited by belief-superior participants—can lead to an increase in political misinformation (Garrett et al., 2016). Thus, by seeking out more (and more biased) information, the belief superior could be both less uninformed and more misinformed than their humbler peers.

Conclusion

The present findings illustrate that the cognitions and behavior of people expressing belief superiority may be a significant obstacle to engaging in civil discourse about contentious political topics (Maki & Raimi, 2017; Raimi & Leary, 2014; Toner et al., 2013). People who professed to have superior beliefs were most likely to inaccurately overestimate their perceived knowledge relative to their actual knowledge on a number of political topics. Perhaps as a consequence of this metacognitive error, the belief superior knowingly engaged in biased information pursuits that privileged information in line with their views. Paradoxically, this enhanced congeniality bias prevents belief-superior people from being exposed to information that might improve the accuracy of their knowledge or allow them to engage in constructive political discourse. Future research should address how belief superiority can be more effectively tempered to bring about more positive engagement with people or information that do not reflect their own “superior” views.

CHAPTER V

Conclusion

The present dissertation compiled evidence from three areas of research to assess how selective exposure—the tendency for people to be exposed to mostly congenial (vs. uncongenial) information—is facilitated by various social psychological factors. This final chapter summarizes the findings of Chapters 2, 3, and 4 and explores implications for both attitude selectivity and *de facto* processes (Festinger, 1957; Freedman & Sears, 1965; Hart et al., 2009; Sears, 1968). Lastly, I consider how each chapter contributes to research about reducing selective exposure and their implications for modern information environments.

Summary of Findings

Chapter 2 assessed whether different beliefs about climate change could be attributed to participants existing in different climate-relevant information environments, or perceiving climate-relevant information differently. Based on information about statewide temperatures and local severe weather events, participants with different climate change beliefs throughout the study did not appear to live in fundamentally different information environments. That is, both climate change believers and skeptics experienced similar statewide temperature deviations and numbers of severe weather events in their local areas at each time point. Despite these objective similarities, perceptions of their local weather differed significantly throughout the study: Climate change believers were more likely than skeptics to see their local weather as worse and more unusual and believed that notable weather events (e.g., droughts, blizzards, heat spells) were increasing in frequency. Climate change believers were also more likely to be aware of

national severe weather events and to believe in that climate change contributed to them. Overall, Chapter 2 suggests that despite being exposed to similar climate-relevant information, climate change believers and skeptics alike reported weather and climate perceptions that aligned with their beliefs.

Chapter 3 detailed studies about online information exchange in dyadic relationships from two perspectives: selectors who chose information for others, and recipients who evaluated information that had been chosen for them. Results indicated that selectors accounted for likable (but not unlikable) recipients' attitudes when the topic was novel to the selector, but relied primarily on their own attitudes when choosing information about an issue for which they already had an attitude. Thus, when it came to political issues, selectors chose information for others that they would personally find congenial, although they rewarded likable recipients who agreed with them with especially congenial information. For recipients, evaluations of gun control information that had ostensibly been chosen for them were significantly affected by the nature of the selector-recipient relationship. When selectors and recipients only had superficial information about each other, recipients judged information primarily by its congeniality with their gun control attitude; however, when recipients formed a more intimate bond with selectors, recipients regarded all information—regardless of congeniality—more favorably when it came from a likable selector. Thus, Chapter 3's results indicate that although selectors engaged in selective exposure for the self when choosing information for others on a familiar topic, recipients' evaluations of that information depended more on the nature of the selector-recipient relationship than information congeniality.

Lastly, Study 4 explored whether people expressing belief superiority—the belief that one's views are superior to alternative viewpoints—about various political issues possess

superior knowledge about those issues and how they gather additional issue-relevant information. Results consistently found that belief-superior people overstated their issue-relevant knowledge and engaged in more congenial selective exposure. But, experimental attempts to influence people's perceptions of the superiority of their views had mixed success in affecting subsequent information-seeking behavior, indicating that belief superiority was only somewhat responsive to feedback about belief-relevant knowledge.

Evidence for Attitude Selectivity and *de facto* Selective Exposure

Taken together, the results of Chapters 2-4 have a number of implications for the two routes to selective exposure discussed in this dissertation: attitude selectivity and *de facto* selectivity. Attitude selectivity proposes that people actively choose exposure to information that validates versus challenges their views (Hart et al., 2009). *De facto* selectivity instead suggests that people may simply exist in environments that facilitate exposure to more congenial (vs. uncongenial) information, and that their attitudes may have been shaped by those environments in the first place (Freedman & Sears, 1965).

Throughout this dissertation, there was support for attitude selectivity processes in a variety of contexts. Sometimes this evidence was explicit and in line with prior selective exposure research, whereas some results indicated attitude selectivity processes in less explicit ways that may contribute to selective exposure literature. For instance, both Chapters 3 and 4 clearly indicated attitude selectivity processes at work, consistent with prior literature. In Chapter 3, evidence came from both selectors and recipients. When selectors who already had an attitude about the topic (gun control, Study 2) were asked to choose information for a fictitious recipient, they chose information in a manner consistent with attitude selectivity: Relying upon their own views, they chose mostly information that they found congenial (Hart et al., 2009). Recipients

showed attitude selectivity effects, too: Particularly under conditions of weaker selector-recipient bonds—as with recipients who had fictitious partners in Study 3 or those who had scripted, unlikable partners in Study 4—hedonic and utility evaluations of gun control information were consistent with their preexisting gun control attitudes (Ditto & Lopez, 1992; Kunda, 1990).

Next, Chapter 4's studies of belief superiority, knowledge, and information-seeking also showed fairly straightforward attitude selectivity results: Among all participants, those expressing belief superiority were most likely to actively and knowingly engage in selective exposure. Thus, Chapter 4 found that belief superiority, a previously untested factor in selective exposure research, significantly moderated selective exposure. In Studies 2-5, the most belief superior showed the greatest congeniality bias, but the least belief superior (or most humble) showed the most even-handed information selection.

Results from Chapter 2 showed less explicit evidence of attitude selectivity but hinted at the potential for such processes in ways that could inform future research. At nearly every time point throughout the longitudinal study, climate change believers were significantly more likely than skeptics to report being aware of national severe weather events, to believe that climate change was contributing to those events, and to perceive that unusual weather events were occurring with greater frequency. Each of these results could be explained by attitude selectivity: In a search for evidence that conformed to their preexisting beliefs about climate change, perhaps climate change believers devoted more exposure and attention to information about weather events that were unusual or notable, whereas skeptics selectively avoided information about such events. Or, perhaps participants selectively interpreted mixed climate-relevant information in line with their beliefs, consistent with research on motivated reasoning (Ditto & Lopez, 1992; Kahan et al., 2012; Kunda, 1990). A third possibility is that out of an environment that included both

congenial and uncongenial information, participants perceived only what they were motivated to see (Balctis & Dunning, 2006). This last possibility could occur because participants truly perceived only consistent information without awareness of the inconsistent information (Balctis & Dunning, 2006), perhaps because subjective interpretations of weather are imprecise enough to allow for wide-ranging interpretations (Marlon et al., 2018). Thus, some results from Chapter 2 point to the potential for attitude selectivity but could also be explained by more general defensive processing or motivated reasoning.

When it comes to *de facto* selective exposure, there were also indications throughout this dissertation of such processes, although the evidence was often less clear than for attitude selectivity. In Chapter 2, the findings that participants of differing climate change beliefs were not exposed to different weather environments was evidence against *de facto* selectivity. Indeed, for *de facto* selectivity to occur, it would be expected that participants' perceptions would align with more objective weather and climate indicators from their environments, opening up the possibility that the environments shaped those perceptions and attitudes in the first place. Despite living in similar weather environments, participants interpreted their environments as supporting their beliefs about climate change, suggesting that participants used a top-down, attitude-driven approach to interpret their environments, rather than the other way around. However, additional analyses from Chapter 2 indicate that there was one potential indicator of *de facto* processes: Although participants' climate change beliefs predicted concurrent local weather perceptions at each time point, these perceptions at prior time points also predicted future climate change beliefs. These results open up the possibility that perceptions of one's weather environment informed future climate change beliefs. That inference is limited, however, given that future beliefs were influenced by weather *perceptions*—and not objective weather or climate

conditions—which could be the result of subjective interpretation, not true environmental differences. But Chapter 2’s measures of objective weather conditions have their own limitations, and therefore the possibility that participants inferred their climate change beliefs from environmental differences cannot be completely ruled out.

In Chapter 3, there were clearer indications of potential *de facto* processes at work in the context of dyadic information exchanges. Particularly from results for recipients (Studies 3 and 4), Chapter 3 showed how *de facto* selective exposure could be facilitated in online information exchanges by friends and peers. For participants in Studies 3-4 who formed intimate bonds with information “selectors” via the RCIT (Sedikides, 1999), evaluations of gun control information ceased to rely upon its congeniality. Thus, these recipients demonstrated that existing in a mostly congenial information environment without actively selecting the information—*de facto* selectivity—could be facilitated by strongly liked peers. However, Chapter 3 did not measure recipients’ ultimate attitudes about gun control after information exposure, a necessary step to further test the *de facto* hypothesis. Although recipients adjusted their views—primarily of uncongenial information—as a result of the selector’s likability, it is not known whether their attitudes about gun control shifted to reflect the nature of their information environment, a condition of the *de facto* hypothesis (Freedman & Sears, 1965).

Finally, although Chapter 4 did not clearly point to *de facto* selectivity, results did hint at how *de facto* selectivity could occur. Specifically, the causal direction of the links between belief superiority and knowledge acquisition were unclear. In one possibility that supports attitude selectivity, belief-superior people seek to maintain their perceived superiority by selectively choosing congenial (vs. uncongenial) information, which validates their viewpoints (Hart et al., 2009). With their beliefs continually validated through this cycle, belief-superior people continue

to engage in congenial selective exposure. However, another possibility is that by existing in a particular information environment, belief-superior people formed beliefs perceived as superior because their information environments supported that notion of superiority. Then, these belief-superior people engage in selective exposure out of the genuine belief that congenial information is the superior, most correct information available. Although the studies in Chapter 4 cannot resolve this question, the idea of information environments facilitating belief superiority and subsequent selective exposure behavior could be explored in future research.

Implications for Attitude Selectivity and *de facto* Theories

Overall, this dissertation found clearer evidence for selective exposure via attitude selectivity than *de facto* selectivity. Therefore, it could be concluded that people existing in mostly congenial information environments is primarily a result of agentic processes, and not of people inferring their attitudes from their environments. However, despite the fact that modern research consistently finds evidence for attitude selectivity (Hart et al., 2009), this was not always the case. Early theorists about selective exposure used to confront the opposite results: evidence of largely congenial information exposure without clear laboratory evidence of attitude selectivity, which they referred to as the “paradox of *de facto* selective exposure” (Freedman & Sears, 1965; Sears & Freedman, 1967). How did people end up in mostly congenial information environments if laboratory studies found inconsistent attitude selectivity effects, but there were consistent findings that people generally agreed with the information they were presented with in everyday life? These questions spawned the *de facto* hypothesis that people formed attitudes from their information environments. Since that time, *de facto* has been relatively unexplored in research, whereas evidence of attitude selectivity in laboratory settings has mounted (Cotton, 1985; Frey, 1986; Hart et al., 2009). Indeed, attitude selectivity has been documented in a variety

of domains, including political issues (Frimer, Skitka, & Motyl, 2017; Lord et al., 1979), health behaviors (Brock & Balloun, 1967; Earl et al., 2009), and science (Nyhan & Reifler, 2015).

Nonetheless, there may be reasons to question the robustness of attitude selectivity. For instance, research on modern forms of communication and information dissemination—particularly social media—suggest that attitude selectivity may not manifest in all circumstances (Flanagin, 2017; Olmstead et al., 2011). Much of this research has investigated whether modern media promote ideological “echo chambers” of mostly homogeneous information, whereby news consumers actively select into information environments that present mostly congenial information (Sunstein, 2001). However, much research has concluded that such fears are either exaggerated (Bakshy et al., 2015; Diehl et al., 2016; Weeks et al., 2016) or perhaps unfounded, and that these media may actually promote heterogeneous political information environments (Barberá, 2015; Barberá et al., 2015; Messing & Westwood, 2014). Indeed, Chapter 3 of this dissertation supports the idea that information exchanges between peers may promote heterogeneous—not homogeneous—information consumption: Selectors who had an attitude on the topic disseminated information largely in line with their own views, while recipients regarded information differently depending on the nature of their relationship with the selector. And even when selectors disseminated information that was congenial to themselves and the recipient, the information was usually mixed, rather than supporting only one point of view. Thus, Chapter 3 suggests that in a network of positive relationships between peers, people will circulate information they personally find validating but also appraise information from liked others favorably. If this network is comprised of people with heterogeneous viewpoints, then this process should promote distribution and favorable evaluation of heterogeneous information. These processes are consistent with prior communications research (Messing & Westwood,

2014) but somewhat inconsistent with a purely agentic notion of attitude selectivity to mostly congenial information (Sears, 1968).

In addition, attitude selectivity effects may not always translate perfectly from the laboratory to the real world. This may occur in part because many common political information sources do not have strong partisan slants (Peterson, Goel, & Iyengar, 2018), leading to weaker attitude selectivity effects. There may also be systematic differences between the laboratory and real world in terms of information availability. Most selective exposure experiments, including many in this dissertation, provide access to equal amounts of congenial and uncongenial information to participants, which may not truly mirror the real world for all topics. Indeed, Freedman and Sears (1965) specified that selective exposure should be defined by how much one's information choices deviate from a baseline determined by information availability. Depending on the topic, some selective exposure experiments may violate this condition and yield laboratory effects that would not replicate in the real world. For instance, if an experiment found that climate change believers and skeptics both selected climate science articles that largely supported their preexisting beliefs, the researcher would probably conclude that all participants exhibited a selective exposure bias. However, this experimental paradigm might not accurately reflect the real world of climate science availability, in which a strong majority of climate science supports one conclusion about climate change (Cook et al., 2013). In this case, the researcher would erroneously conclude that climate change believers exhibited selective exposure in the laboratory, when in fact their information choices reflected the true availability of climate science in the real world.

Therefore, despite evidence of attitude selectivity in research and the present dissertation, it would be premature to suggest selective exposure only occurs via attitude selectivity. Beyond

the aforementioned limitations of attitude selectivity effects, the *de facto* hypothesis also remains hard to dismiss for several reasons. First, *de facto* is difficult to measure: Early selective exposure theorists cautioned that the *de facto* hypothesis was probably the more difficult prediction to measure, perhaps explaining the relative dearth of research on it (Sears, 1968). *De facto* could also occur for many reasons. Perhaps sycophantic communicators choose to convey information that they know their audiences want to hear. Perhaps audiences exert economic control over information communicators (e.g., newspaper subscribers), leading those communicators to respond by providing congenial information to their audiences. Or, perhaps many issues are simply not very divisive, and instead society has generally come to a consensus about them, leading to an asymmetry of congenial and uncongenial information availability (Sears, 1968). It is also hard to entirely dismiss findings that people more often agree with information that they are exposed to in everyday life (Freedman & Sears, 1965; Sears & Freedman, 1967). People also tend to agree with others around them, even on political issues that are otherwise considered quite divisive (e.g., Hamilton & Keim, 2009). Finally, research has documented instances of attitude change in a singular direction when people changed environments (Newcomb, 1943), indicating an influence of context on attitudes. Thus, although evidence for *de facto* selectivity may be lacking relative to attitude selectivity, it is clearly a process that merits research attention.

Further Implications for Selective Exposure Theory

Results in the present dissertation also have implications for other aspects of selective exposure theories. One aspect concerns a debate about how selective exposure occurs: Is it driven by an increased appetite for congenial information, or an avoidance of uncongenial information? Although the selective exposure results in Chapters 3 and 4 were frequently

presented as congeniality biases (i.e., difference scores between congenial and uncongenial information), it is also important to examine more nuanced differences in consumption of both congenial and uncongenial information (Garrett & Stroud, 2014). When broken down into measures of how much congenial and uncongenial information was selected, results from both Chapters 3 and 4 generally showed that participants in selective exposure tasks: (a) rarely chose only congenial or uncongenial information, and instead usually chose a mix of information; (b) were more likely to adjust their selection of congenial information as a function of the variables of interest (i.e., likability or partner agreement in Chapter 3, belief superiority in Chapter 4); and (c) did adjust their selection of uncongenial articles at times, but less consistently. Thus, the studies in this dissertation showed more consistent evidence for factors that influence the approach of congenial information, although the avoidance of uncongenial information occurred as well, though less consistently (Garrett & Stroud, 2014). These studies also demonstrated that selective exposure is rarely an all-or-nothing endeavor; instead, participants usually chose (for themselves and others) a mix of congenial and uncongenial information. Selective exposure tasks that allow only for binary choices between congenial or uncongenial information may therefore make overly strong conclusions about selective exposure, in addition to lacking external validity.

Another facet of selective exposure research that this dissertation can contribute to concerns how people utilize source and message characteristics of information content. In modern forms of mass communication (e.g., social media), a news item's "source" can take various forms and change throughout its life cycle. For instance, an article originating from a traditional news source can be distributed throughout a social network in ways that reframe or diminish the prominence of the original source, such that the information purveyor (i.e., a social network connection) may become the new "source" of that information (Flanagin, 2017;

Messing & Westwood, 2014). In this context, understanding how information recipients evaluate information based on its source or message characteristics changes, and the results of Chapter 3 can shed some light on this process. With the limitations that the studies in Chapter 3 were not conducted on social media and the congenial and uncongenial messages did not contain original source information, Chapter 3 has implications for how information recipients evaluate source and message information. Chapter 3 found that for information recipients, the information's "source"—their partner, the alleged selector—mattered a great deal. Specifically, when information was communicated from a highly likable selector, the congeniality of the information mattered much less; recipients in these circumstances evaluated uncongenial information as favorably as congenial information on hedonic and utility measures. Thus, although Chapter 3 did not examine how the official news source interacted with the likability of the selector, Chapter 3 suggests that social endorsements of political information are highly influential to the recipient, consistent with prior research (Messing & Westwood, 2014).

Chapter 4's results on belief superiority are also relevant to several aspects of selective exposure. First, belief superiority has implications for two common motives of attitude selectivity: accuracy and defense (Hart et al., 2009). By convincing themselves that their view is not only *better* than other views, but is also *more correct*, the belief superior turn a perception that is defensively-oriented into one that is also ostensibly motivated by accuracy. In this way, belief superiority manages to serve both defense and accuracy motivations (Earl & Hall, in press). In addition, Chapter 4 found that although belief superiority is significantly correlated with other measures of attitude strength, it may influence selective exposure differently. For instance, belief superiority was associated with *increased* congenial selective exposure, whereas prior research has found that belief confidence, a related measure, is negatively related to

selective exposure (Hart et al., 2009). Thus, belief superiority may have distinct selectivity effects from other attitude strength constructs.

Lastly, this dissertation has implications for recent concerns about information “echo chambers” (Peterson et al., 2018; Stroud, 2008; Sunstein, 2001) and the spread of inaccurate information in online settings (Garrett et al., 2016; Guess et al., 2018). The results of Chapter 3 have both positive and negative implications for these concerns. On the positive side, Chapter 3 showed that despite selectors generally disseminating information that they personally found congenial, recipients who felt positively about selectors evaluated all information—regardless of congeniality—more favorably, indicating that positive selector-recipient relationships can promote healthy consumption of heterogeneous viewpoints. However, a potential downside of this dynamic—which is currently unexplored—is that these conditions may also be ripe for the spread of misinformation, which can be consequential and difficult to counter (Chan, Jones, Hall Jamieson, & Albarracín, 2017). If recipients ignore content characteristics when receiving information from a highly likable selector, then recipients could be vulnerable to consuming false information. And from Chapter 4, there is reason to think that belief superiority may enhance an individual’s vulnerability to consuming false information. Belief superiority is associated with belief certainty (Hall & Raimi, 2018), and research suggests that certainty is associated with less processing of attitude-relevant information (Tormala & Rucker, 2018), perhaps indicating a lack of scrutiny for information among the belief superior. Belief superiority is also associated with belief extremity, and research has linked more extreme partisan views with increased selective exposure (Garrett, 2013; Peterson et al., 2018) and intake of politically congenial misinformation (Guess et al., 2018). Therefore, although Chapter 4 did not examine

how belief-superior people regard information validity cues, whether the belief superior are vulnerable to misinformation is deserving of future study.

Selective Exposure Reduction

The results of this dissertation also have implications for derailing selective exposure processes, whether they be motivational (attitude selectivity) or contextual (*de facto*). Selective exposure has the potential for the pernicious effect of leading people to exist in homogeneous information environments (Sunstein, 2001), whereby their exposure to mostly congenial information could promote inaccurate or misleading beliefs (Garrett et al., 2016). Thus, considering how the present results shed light on future selective exposure reduction strategies is of practical importance.

In Chapter 2, results illustrated the strong effects of motivated reasoning, such that participants reported subjective perceptions that mostly aligned with their climate change beliefs, despite objective inconsistencies (Kunda, 1990). But, the results about national extreme weather events may point to a promising direction for reducing motivated reasoning. Climate change believers were more likely than skeptics to report awareness of and belief in climate change's contribution to national weather events throughout the study, perhaps indicating that greater attention to non-local weather and climate information could specifically influence climate change skeptics toward greater acceptance of the scientific consensus that climate change is occurring (Cook et al., 2013). This possibility is consistent with research showing that people are more likely to believe that climate is affecting distant areas, but not their own locales (Gifford et al., 2009). In addition, both climate change believers and skeptics reported local weather perceptions that were often inconsistent with objective conditions, but perhaps making the effects (and non-effects) of climate change clearer could reduce this perceptual disparity. Indeed,

researchers have begun to work with local meteorologists—who are seen as trusted purveyors of weather and climate information—to present evidence and facts about climate change more clearly to their audiences (Climate Central, 2018; Maibach et al., 2016).

From Chapter 3, the clearest route to selective exposure reduction came from the results of Studies 3-4: Recipients who had intimate exchanges with highly likable selectors disregarded the congeniality of information they ostensibly received from that selector, demonstrating highly positive receptivity to information coming from well-liked peers. This is a highly promising result that could assuage fears about negative effects of homogeneous echo chambers (Sunstein, 2001). Indeed, these results indicate that as long as people have social networks full of likable people with heterogeneous viewpoints (which may be the case: see Barberá, 2015), they may not only be exposed to heterogeneous views (as Studies 1-2 of Chapter 4 suggest) but may also evaluate heterogeneous information in an open-minded manner.

Lastly, although Chapter 4 showed that the association between belief superiority and congenial selective exposure was fairly robust across numerous political topics, Study 4 found that communicating the knowledge deficiency of one's attitudinal ingroup successfully reduced belief superiority, thereby decreasing selective exposure. However, showing the belief superior their individual knowledge scores (Study 5) did not yield similar reductions for those who demonstrated inferior knowledge. Thus, perhaps appealing to individuals' sense of group membership is a promising avenue for future work investigating selective exposure

APPENDIX I

Supplementary Materials for Chapter III

Studies 1 & 2: Likability manipulation

1. What is your gender?
 - **Likable:** *Male*
 - **Unlikable:** *Male*
2. What is your occupation?
 - **Likable:** *Retail*
 - **Unlikable:** *Retail*
3. What is your favorite color?
 - **Likable:** *Blue*
 - **Unlikable:** *Favorite color is irrelevant to knowing people.*
4. What hobbies or leisure activities do you participate in?
 - **Likable:** *I enjoy playing co-rec sports. I also enjoy spending time with friends.*
 - **Unlikable:** *Hobbies are a waste of time.*
5. What is one unique trait you have?
 - **Likable:** *I guess I would say that I am very passionate about life, and I try not to take a moment for granted.*
 - **Unlikable:** *I get what I want in negotiations.*
6. Please give an example of one of your personal values.
 - **Likable:** *I value my relationships with family and friends.*
 - **Unlikable:** *I'm just here to get paid, not too interested in learning your values. Sorry if that hurts!*
7. What do you enjoy about the experience of being a Mechanical Turk worker?
 - **Likable:** *I take a lot of pride in being an honest Mturk worker and I really try to thoughtfully answer the questions that I respond to. I know that the requesters really value the quality of our data, so I take things seriously in order to provide useful data for them.*
 - **Unlikable:** *I just do this for the money. It doesn't matter if your answers make any sense. Most requesters just pay you regardless because they're too lazy to*

check. And if they don't pay me then I just complain and threaten to give them bad reviews to other workers.

Study 1: Validity manipulation

Valid test: *They said to say something about the test. From the scoring, I guess I did really well. I bet this test is a good and genuine measure of my intelligence. They said you give me things to read about the test now...*

Invalid test: *They said to say something about the test. From the scoring, I didn't do too well. But I think this test is complete garbage and doesn't measure intelligence the way it should. It's not a good test. They said you give me things to read about the test now...*

Study 2: Attitude manipulation

Pro-gun control: *They said to say something about my attitude on gun control. In general, I support gun control measures, but only in the sense that certain steps should be taken in order for someone to purchase a gun.*

Anti-gun control: *They said to say something about my attitude on gun control. In general, I do not support gun control measures, except for certain steps that should be taken in order for someone to purchase a gun.*

Study 3: Likability manipulation

1. What is your gender?
 - **Likable:** *Male*
 - **Unlikable:** *Male*
2. What is your declared or intended major?
 - **Likable:** *Bio*
 - **Unlikable:** *Bio*
3. What is your favorite color?
 - **Likable:** *Blue*
 - **Unlikable:** *if you care to know this, you're probably stupid because favorite color is irrelevant to knowing people. lol*
4. What extracurricular activities do you participate in?
 - **Likable:** *I enjoy playing intramural sports. I also enjoy spending time with family and friends.*
 - **Unlikable:** *campus activities are a waste of time for sure.*

5. What is one unique trait you have?
 - **Likable:** *I think I'm a lot like other people. I guess I would say that I am very passionate about life, and I try not to take a moment for granted.*
 - **Unlikable:** *i know how to cheat on test without getting caught. doing this for a while now, sorry won't share with you...lol*

6. Please give an example of one of your personal values.
 - **Likable:** *I value my relationships with family and friends.*
 - **Unlikable:** *c'mon. so i hope you're not so lame to be answering these qs...not too interested in learning your values...sorry if that hurts!*

Studies 3 & 4: RCIT questions

Block 1

1. What is your name?
2. How old are you?
3. Where are you from?
4. What year are you at the University of Michigan?
5. What do you think you might major in? Why?
6. What made you come to the University of Michigan?
7. What is your favorite class you've taken at the University? Why?

Block 2

1. What are your hobbies?
2. What would you like to do after graduating from the University?
3. What would be the perfect lifestyle for you?
4. What is something you have always wanted to do, but probably never will be able to do?
5. If you could travel anywhere in the world, where would you go and why?
6. What is one strange thing that has happened to you since arriving at the University of Michigan?
7. What is one embarrassing thing that has happened to you since arriving at the University of Michigan?
8. What is one thing in your life that makes you stressed out?
9. If you could change anything that happened to you in high school, what would that be?
10. If you could change one thing about yourself, what would that be?
11. Do you miss your family?
12. What is one habit you'd like to break?

Block 3

1. If you could have one wish granted, what would that be?
2. Is it easy or difficult for you to meet people? Why?
3. Describe the last time you felt lonely.

4. What is one emotional experience you've had with a good friend?
5. What is one of your biggest fears?
6. What is your most frightening early memory?
7. What is your happiest early childhood memory?
8. What is one thing about yourself that most people would consider surprising?
9. What is one recent accomplishment that you are proud of?
10. Tell me one thing about yourself that most people who already know you don't know.

Study 4: Unlikable confederate RCIT script

Block 1

1. What is your name?
Alex
2. How old are you?
18
3. Where are you from?
NYC...way more exciting than michigan
4. What year are you at the University of Michigan?
freshman
5. What do you think you might major in? Why?
don't really know yet
6. What made you come to the University of Michigan?
wasn't my first choice but at least it's an easy school and i'll get way better grades than most people
7. What is your favorite class you've taken at the University? Why?
so far my classes are easy, but I can tell most people think it's hard. how could chemistry possibly be difficult??

Block 2

1. What are your hobbies?
no point in telling you...it's not like we would ever hang out
2. What would you like to do after graduating from the University?
make as much money as I can
3. What would be the perfect lifestyle for you?
get rich so I don't have to listen to anyone
4. What is something you have always wanted to do, but probably never will be able to do?
i don't accept limits...nothing will hold me back
5. If you could travel anywhere in the world, where would you go and why?
miami...party it up
6. What is one strange thing that has happened to you since arriving at the University of Michigan?
it was hilarious watching the faces of all the students in the big house when MSU won...why do people care so much haha

7. What is one embarrassing thing that has happened to you since arriving at the University of Michigan?
can't really think of anything. I don't get embarrassed that easily
8. What is one thing in your life that makes you stressed out?
people that get in my way
9. If you could change anything that happened to you in high school, what would that be?
the lame people I went to high school with...they're a lot like the people here
10. If you could change one thing about yourself, what would that be?
not a thing. obviously I am the best
11. Do you miss your family?
nope, so nice to not have to deal with their stupid problems
12. What is one habit you'd like to break?
i always stop for pedestrians who are trying to cross the street, but what's the point? i got places to be

Block 3

1. If you could have one wish granted, what would that be?
obviously more wishes
2. Is it easy or difficult for you to meet people? Why?
not hard to meet people, but most people suck so it's pointless
3. Describe the last time you felt lonely.
doesn't happen to me
4. What is one emotional experience you've had with a good friend?
why are we supposed to get all sappy? not feeling it
5. What is one of your biggest fears?
being mediocre
6. What is your most frightening early memory?
mimes...can't believe I used to be scared of those losers
7. What is your happiest early childhood memory?
being described as "gifted"
8. What is one thing about yourself that most people would consider surprising?
if you're in my inner circle, i look out for you
9. What is one recent accomplishment that you are proud of?
i bribed my GSI to give me an A on a paper
10. Tell me one thing about yourself that most people who already know you don't know.
ate jimmy johns for lunch

Study 4: Box model instructions

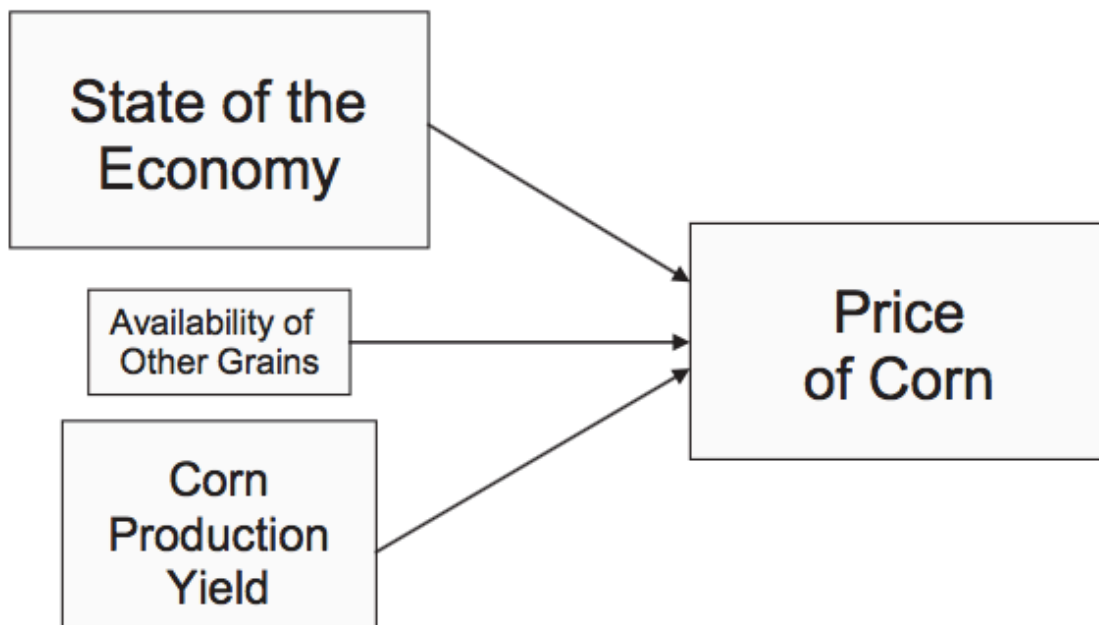
Now, we would like you to consider your partner's choices of articles for you to read. In particular, we would like to know what factors you believe influenced your partner's decision over what articles to pick for you. To answer this question, we will ask you to draw a model that depicts the influence of various factors on your partner's decision.

There are models for predicting all sorts of things. These models generally include a number of different factors that are believed to predict an outcome, and they assign different values to those factors depending on how important each one is thought to be.

Example: A model for predicting the price of corn next season might include 3 factors:

- 1) The state of the economy (e.g., is there a recession?)
- 2) The availability of other grains (e.g., is this a good season for wheat?)
- 3) The yield of corn production that season (e.g., did a good deal of corn grow this season, or not much?)

Let's imagine that our model assumes that the **state of the economy** is the most important factor, that the **yield of corn** is a close second, and that the **availability of other grains** is a distant third. In that case, the model could look something like this (below).



Now it's your turn. Using the pencil and graph paper provided to you by the experimenter (please notify the experimenter if you do not have these materials), please illustrate the influence of each of the following factors on your partner's choice of articles for you.

The outcome you are predicting in this model is: **Your partner's choice of articles for you.**

Here are some potential factors to include in your model:

- 1) Your beliefs and attitudes.
- 2) Your partner's beliefs and attitudes.
- 3) Your personality.
- 4) Your partner's personality.
- 5) Random chance.
- 6) Other

If you choose a factor under "Other", please specify what that factor is in your model.

APPENDIX II

Supplementary Materials for Chapter IV

Study 1a – General Political Knowledge Quiz

(correct answers are **bolded**)

1. Which job or political office is now held by Mike Pence?
 - a. White House Press Secretary
 - b. U.S. Senator
 - c. Secretary of State
 - d. Vice President**
2. Who has the final responsibility to determine if a law is constitutional or not?
 - a. The President
 - b. The Congress
 - c. The Supreme Court**
3. How much of a majority is required for the U.S. Senate and House to override a presidential veto?
 - a. One-half plus one
 - b. Two-thirds**
 - c. Three-fourths
 - d. Three-fifths
4. Which of the two major political parties in the U.S. is more conservative on the national level?
 - a. Democratic Party
 - b. Republican Party**
5. Who is the current speaker of the U.S. House of Representatives?
 - a. John Boehner
 - b. Paul Ryan**
 - c. Nancy Pelosi
 - d. Harry Reid
6. Who is the current Chief Justice of the U.S. Supreme Court?
 - a. William Rehnquist
 - b. Antonin Scalia
 - c. John Roberts**
 - d. Samuel Alito

7. Who is the current President of Iran?
 - a. Mahmoud Ahmadinejad
 - b. Nouri al-Maliki
 - c. Hamid Karzai
 - d. **Hassan Rouhani**

8. Which position is currently held by Janet Yellen?
 - a. Treasury Secretary
 - b. **Chair of the Federal Reserve**
 - c. Secretary of Homeland Security
 - d. Chairman of the National Economic Council

9. Which position is currently held by Angela Merkel?
 - a. **Chancellor of Germany**
 - b. Foreign Minister of the European Union
 - c. Prime Minister of Turkey
 - d. U.N. Secretary General

10. How many years are there in one full term of office for a U.S. Senator?
 - a. **6 years**
 - b. 4 years
 - c. 2 years

11. In 2015, the U.S. re-established diplomatic relations with which of the following countries?
 - a. Russia
 - b. North Korea
 - c. **Cuba**
 - d. Yemen

12. To comply with the health care law, most Americans need to indicate they have health insurance coverage when they...
 - a. Change their address
 - b. Receive a driver's license
 - c. **File their taxes**
 - d. Vote in an election

13. There are currently eight justices on the U.S. Supreme Court. How many are women?
 - a. One
 - b. Two
 - c. **Three**
 - d. Four

14. Which political party—Democratic or Republican—currently has the most members in the U.S. House of Representatives?

- a. Democratic Party
 - b. Republican Party**
15. In 2015, the U.S. and other allies successfully negotiated an agreement to reduce the nuclear weapons program of which of the following countries?
- a. Iran**
 - b. North Korea
 - c. Russia
 - d. Pakistan

Study 1a – Issue-Specific Knowledge Questions by Issue

(correct answers are **bolded**; questions in *italics* were excluded from later studies; sources appear after correct answers)

Income Inequality

1. Which of the following is true about the relationship between the stock market and household incomes in the U.S. since the Great Recession of 2007-2009?
 - a. The median family income has decreased, whereas the value of the stock market has increased.** (source: http://www.nytimes.com/2016/09/14/business/economy/us-census-household-income-poverty-wealth-2015.html?_r=0)
 - b. The value of the stock market and family incomes have both increased.
 - c. The value of the stock market and family incomes have both decreased.
 - d. The median family income has increased, whereas the value of the stock market has decreased.

2. As of 2005, 44.3% of income was earned by the top 10% of Americans. During what era was there a similar level of income inequality in the United States?
 - a. 1950s
 - b. 1940s
 - c. 1930s
 - d. 1920s** (source: <http://www.nytimes.com/2007/03/29/business/29tax.html?ex=1332820800&en=f472e72466c34c8&ei=5088&partner=rssnyt&emc=rss>)

3. When was the last time the federal minimum wage was increased by the U.S. Congress?
 - a. 1995
 - b. 2000
 - c. 2009** (source: <http://www.nytimes.com/roomfordebate/2016/09/29/poverty-prosperity-and-the-minimum-wage/benefits-of-minimum-wage-increases-seem-too-good-to-be-true-but-theyre-not>)
 - d. 2014

4. What is the current federal minimum wage in the United States?
 - a. \$9.25 per hour**

- b. \$8.00 per hour
 - c. **\$7.25 per hour** (source: <https://www.dol.gov/general/topic/wages/minimumwage>)
 - d. \$6.00 per hour
5. What is the “Buffett rule,” named in reference to one of its chief advocates, Warren Buffett?
- a. Capital gains taxes should be lower than they currently are.
 - b. Capital gains taxes should be exempt from taxation overall.
 - c. Individuals in the upper levels of income should be paying taxes on *the same* proportion of their income as those in middle- and lower-class tax brackets.
 - d. **Individuals in the upper levels of income should be paying taxes on a higher proportion of their income than those in middle- and lower-class tax brackets.** (source: https://obamawhitehouse.archives.gov/sites/default/files/Buffett_Rule_Report_Final.pdf)
6. Of the following racial groups in the United States, which group has the highest household median income according to 2015 data from the U.S. Census Bureau?
- a. **Asian** (source: <https://www.census.gov/content/dam/Census/library/publications/2015/demo/p60-252.pdf>)
 - b. White / Caucasian
 - c. Hispanic
 - d. Black
7. According to 2014 data, about what percentage of Americans earn incomes at or below the federal poverty line?
- a. 8%
 - b. **15%** (source: <http://www.census.gov/library/publications/2015/demo/p60-252.html>)
 - c. 21%
 - d. 25%
8. One U.S. state already provides a version of a guaranteed basic income for its residents, which is funded by state oil revenues. Which state is it?
- a. California
 - b. Texas
 - c. **Alaska** (source: <http://usbig.net/alaskablog/about-the-alaska-dividend/>)
 - d. North Dakota
9. *What was the primary goal of the Occupy movement in the United States?*
- a. *Immigration reform*
 - b. *Lower income tax rates for middle- and lower-income Americans*
 - c. *Preserving social safety net programs, such as Social Security, Medicare, and Medicaid*

- d. **Increasing distribution of economic gains more equally in the United States** (source: <https://www.bloomberg.com/news/articles/2011-10-27/occupy-wall-street-it-s-not-a-hippie-thing>)

Size of Federal Government

1. Which of the following is not true about the Affordable Care Act (ACA), also known as Obamacare?
 - a. Americans must report that they have health insurance when they file their taxes.
 - b. **The ACA created a public option for Americans to receive health care coverage directly from the federal government.** (source: <http://jama.jamanetwork.com/article.aspx?articleid=2533698>)
 - c. The federal government funds individual states to expand their Medicaid rolls in order to provide coverage for uninsured Americans.
 - d. As a result of the ACA, more Americans are enrolled in private health insurance coverage than before the passage of the law.

2. In 2010, the National Commission on Fiscal Responsibility and Reform released a set of policy recommendations that were designed to achieve fiscal sustainability over the long term for the U.S. federal government. What was another name for this commission?
 - a. **Simpson-Bowles Commission** (source: <http://www.politifact.com/truth-o-meter/article/2012/aug/30/ryan-and-simpson-bowles-commission-full-story/>)
 - b. Budget Sequestration Commission
 - c. Ryan-Murray Commission
 - d. Budget Control Commission

3. Which of the major political parties in the United States emphasizes reducing the size of the federal government and giving individual states more control?
 - a. Democratic Party
 - b. **Republican Party** (source: <http://pledge.gop.gov/resources/library/documents/solutions/pledge-pocket-card.pdf>)
 - c. Green Party
 - d. None of the above

4. *Under which of the following presidents was federal government employment at its highest?*
 - a. **John F. Kennedy** (source: <https://blogs.wsj.com/economics/2014/11/07/the-federal-government-now-employs-the-fewest-people-since-1966/>)
 - b. Ronald Reagan
 - c. George W. Bush
 - d. Barack Obama

5. *Which of the following is true about the number of uniformed military personnel employed by the federal government?*
 - a. *The number of uniformed military personnel is at its highest ever.*

- b. **The number of uniformed military personnel peaked during the Cold War and has been declining for the last few decades.** (source: https://www.dmdc.osd.mil/appj/dwp/dwp_reports.jsp)
 - c. The number of uniformed military personnel is the same as it was during most of the Cold War.
 - d. The number of uniformed military personnel is at its lowest point in the last century.
6. Since the beginning of Barack Obama's presidency, which of the following is true about American income taxes?
- a. Income tax rates have increased for all Americans.
 - b. Income tax rates have not changed from the rates established during the presidency of George W. Bush.
 - c. **Income tax rates have increased for the highest income levels, but tax rates for middle- and lower-class Americans have not changed from the rates established during the presidency of George W. Bush.** (source: <http://time.com/money/4630346/president-obama-taxes-increase-obamacare/>)
 - d. Income tax rates have decreased for all Americans.

Terrorism

1. Which of the following groups that are now considered terrorists once received funding from the U.S government in order to fight against a Soviet invasion?
 - a. Taliban
 - b. **Al-Qaeda** (source: <http://www.independent.co.uk/news/terror-blowback-burns-cia-1182087.html>)
 - c. ISIS
 - d. Muslim Brotherhood
2. Which of the following is true about the relationship between Al-Qaeda and ISIS?
 - a. They work together and have similar goals.
 - b. ISIS does not align itself with Al-Qaeda because it perceives Al-Qaeda as being too extreme.
 - c. **Al-Qaeda does not align itself with ISIS because it perceives ISIS as being too extreme.** (source: <http://www.reuters.com/article/us-syria-crisis-qaeda-idUSBREA120NS20140203>)
 - d. ISIS and Al-Qaeda are two different names for the same group.
3. Which of the following is an American citizen who was killed by a targeted U.S. government drone strike in 2011?
 - a. **Anwar al-Awlaki** (source: <http://www.nytimes.com/2015/08/30/magazine/the-lessons-of-anwar-al-awlaki.html>)
 - b. Johnny Walker Lindh
 - c. Nidal Hassan
 - d. Umar Farouk Abdulmutallab

4. *The 2013 Boston Marathon bombers had ethnic origins in which part of the world?*
 - a. *Pakistan*
 - b. *Kyrgyzstan*
 - c. **Chechnya** (source: <https://www.theguardian.com/world/2013/apr/19/tamerlan-dzhokhar-tsarnaev-boston-bombings-chechnya>)
 - d. *United States*

5. *Between 2000-2014, what percentage of global terrorism deaths took place in Western countries?*
 - a. *31.3%*
 - b. *20.4%*
 - c. *10.8%*
 - d. **2.6%** (source: <http://www.abc.net.au/news/2015-11-17/global-terrorism-index-increase/6947200>)

6. *When he was killed in 2011, where was Osama bin Laden living?*
 - a. *Afghanistan*
 - b. *Iraq*
 - c. **Pakistan** (source: <https://thelede.blogs.nytimes.com/2011/05/01/bin-laden-dead-u-s-official-says/>)
 - d. *Somalia*

Economy & Jobs

1. According to Bureau of Labor Statistics, what is the U.S. unemployment rate as of January 2016?
 - a. **4.9%** (source: <http://data.bls.gov/timeseries/LNS14000000>)
 - b. *5.8%*
 - c. *6.0%*
 - d. *7.2%*

2. *During the Great Recession, the U.S. unemployment rate peaked at 10% in October 2009. When was the previous time the U.S. unemployment had broken 10%?*
 - a. *1939*
 - b. *1975*
 - c. **1982** (source: <http://www.tradingeconomics.com/united-states/unemployment-rate>)
 - d. *2001*

3. *American workers who hold part-time work but are seeking full-time work are considered _____, whereas American workers who do not hold a job at all but are seeking one are considered _____.*
 - a. *unemployed; underemployed*
 - b. **underemployed; unemployed** (source: <https://www.quora.com/What-is-the-difference-between-unemployment-and-underemployment>)
 - c. *employed; underemployed*

- d. *employed; unemployed*
4. As of 2015, which of the following is true about gender differences in earnings in the United States?
- Full-time employed women and men earn roughly the same amount.
 - Full-time employed women earn 95 cents on the dollar compared to men.
 - Full-time employed women earn 83 cents on the dollar compared to men.** (source: <http://www.bls.gov/opub/ted/2016/womens-earnings-83-percent-of-mens-but-vary-by-occupation.htm>)
 - The race or ethnicity of the woman doesn't matter; women of color experience roughly the same pay gap as White women as compared to men.
5. According to the Bureau of Labor Statistics, which of the following is true about union membership amongst American workers?
- Over the past three decades, the share of American workers who are union members has fallen by 50%.** (source: <http://www.bls.gov/news.release/union2.nr0.htm>)
 - Over the past three decades, the share of American workers who are union members has not changed substantially.
 - Over the past three decades, the share of American workers who are union members has steadily increased.
 - Over the past three decades, the share of American workers who are union members declined dramatically but has increased substantially in the last five years.
6. *What was the American Recovery and Reinvestment Act (ARRA), also known as the stimulus package?*
- An economic stimulus bill signed into law by President George W. Bush*
 - An economic stimulus bill signed into law by President Barack Obama*** (source: <https://obamawhitehouse.archives.gov/recovery/about>)
 - An economic stimulus bill that was vetoed by President George W. Bush*
 - An economic stimulus bill that was vetoed by President Barack Obama*

Gun Control

1. Which of the following is true about the Federal Assault Weapons Ban, also known as the Public Safety and Recreational Firearms Use Protection Act?
- It was signed into law in 1994 by President Bill Clinton and is still the current law.
 - It was signed into law in 1994 by President Bill Clinton and expired in 2004.** (source: http://articles.chicagotribune.com/1993-11-18/news/9311180157_1_brady-bill-ban-assault-weapons-violent-crime)
 - It imposed a ban on all firearms that are not explicitly used for hunting.
 - It was supported by the National Rifle Association at the time of passage.
2. As of 2015, what percentage of Americans have a gun in their house or on their property?

- a. 10%
 - b. 28%
 - c. **43%** (source: http://www.gallup.com/poll/186236/americans-desire-stricter-gun-laws-sharply.aspx?g_source=Social%20Issues&g_medium=newsfeed&g_campaign=tiles)
 - d. 66%
3. In 2013, roughly _____ people in the United States died in firearm-related deaths, and about _____ of those were suicides.
- a. 50,000; 63%
 - b. 50,000; 17%
 - c. **33,000; 63%** (source: <https://fivethirtyeight.com/features/gun-deaths/>)
 - d. 33,000; 17%
4. Which of the following is true about laws that permit carrying firearms onto college or university campuses in the United States?
- a. Texas is the only state that allows firearms to be carried onto campuses.
 - b. Many states allow firearms on campuses, but in no states are they allowed into dormitories or classrooms.
 - c. Democratic presidential candidate Hillary Clinton publicly supports the right to carry a firearm on campuses.
 - d. **Firearms are permitted under some or any circumstances on campuses in 30 states.** (source: <http://www.armedcampuses.org/>)
5. Which of the following is the top reason cited by American firearm owners as their reason for owning a firearm?
- a. **Personal safety/protection** (source: http://www.gallup.com/poll/165605/personal-safety-top-reason-americans-own-guns-today.aspx?g_source=gun&g_medium=search&g_campaign=tiles)
 - b. Hunting
 - c. Target shooting
 - d. 2nd Amendment right
6. Which of the following U.S. regions has the highest rate of firearm-related deaths over the last 15 years?
- a. Northeast
 - b. Midwest
 - c. **South** (source: <https://www.washingtonpost.com/news/wonk/wp/2015/06/18/11-essential-facts-about-guns-and-mass-shootings-in-the-united-states/>)
 - d. West
7. Which of the following is true about universal background checks for firearm purchases?
- a. **Polls show that around 90% of Americans support universal background checks.** (source: <http://www.cbsnews.com/news/cbsnyt-poll-gop-voters-have-deep-concerns-about-government/>)

- b. *A universal background checks law was passed by the U.S. Senate in 2013 after the Newtown shooting.*
- c. *Firearm sales at gun shows or over the Internet are subject to background checks under current law.*
- d. *Most NRA (National Rifle Association) members do not support universal background checks.*

Study 2 – Headlines & Article Links

Note: Participants were only shown headlines in selective exposure task

1. Sub-topic: Unemployment
 - **U.S. Jobless Claims at Lowest Level Since 1973** (*Bloomberg*, <http://tinyurl.com/hfnyjtl>)
 - **Hollow Promises: Why America’s 5% Unemployment Rate Feels Like a Lie** (*Quartz*, <http://tinyurl.com/gkvk6ck>)
2. Sub-topic: Unemployment vs. underemployment
 - **Recent College Graduates Are No Longer As Underemployed** (*FiveThirtyEight*, <http://tinyurl.com/zw9bojc>)
 - **Many Underemployed U.S. Workers Have Never Recovered From the Great Recession** (*Wall Street Journal*, <http://tinyurl.com/zvr62js>)
3. Sub-topic: Union membership
 - **Strong Unions, Strong Democracy** (*New York Times*, <http://tinyurl.com/zk3deuy>)
 - **Because of Unions, Employers Can’t Even Require Service Workers to be Pleasant** (*Quartz*, <http://tinyurl.com/jkjfclp>)
4. Sub-topic: Stimulus package
 - **The New New Deal: The Astonishing Success of the Stimulus Package** (*Slate*, <http://tinyurl.com/9cs6jvx>)
 - **The Stimulus Package Never Worked** (*U.S. News & World Report*, <http://tinyurl.com/zuf9y2z>)

Studies 3 & 4 – Headlines & Article Links

Note: Participants were only shown headlines in selective exposure task

1. Minimum wage
 - **Raising Wages Would Stop 1.2 Million Households from Going Hungry** (*The Nation*, <https://www.thenation.com/article/a-15-minimum-wage-would-stop-1-2-million-households-from-going-hungry/>)
 - **Why Raising Wages So Much Should Scare Us** (*PBS*, <http://www.pbs.org/newshour/making-sense/column-15-minimum-wage-scare-us/>)
2. Income inequality

- **How Income Inequality Harms Us All, and How to Fix It** (*Pacific Standard*, <https://psmag.com/the-new-american-inequality-3fa63903849#.pd40p01g8>)
 - **The Benefits of Income Inequality** (*Time*, <http://time.com/4474437/upside-of-income-inequality/>)
3. Race and income inequality
 - **Income Inequality Especially Affects People of Color** (*Salon*, <http://www.salon.com/2016/08/21/white-privilege-as-economic-reality-it-would-take-african-americans-228-years-to-reach-the-same-level-of-wealth-as-whites/>)
 - **Income Inequality Conversations Focus Too Much on Racial Group Differences** (*The Atlantic*, <http://www.theatlantic.com/business/archive/2016/04/is-america-having-the-wrong-conversation-about-income-inequality/477024/>)
 4. Universal basic income
 - **Yes, a Basic Income Would Change Our Work Ethic – For the Better** (*Quartz*, <http://qz.com/765902/ubi-wouldnt-mean-everyone-quits-working/>)
 - **Universal Basic Income Won't Make America Great Again, Either** (*Washington Post*, https://www.washingtonpost.com/posteverything/wp/2016/04/04/universal-basic-income-wont-make-america-great-again-either/?utm_term=.be1b13bfc924)
 5. Poverty and basic income
 - **Universal Basic Income is the Best Tool to Fight Poverty** (*Huffington Post*, http://www.huffingtonpost.com/scott-santens/universal-basic-income-is_b_10251176.html)
 - **Universal Basic Income is a Poor Tool to Fight Poverty** (*New York Times*, http://www.nytimes.com/2016/06/01/business/economy/universal-basic-income-poverty.html?_r=1)

Study 5 – Headlines & Article Links

Note: Participants were only shown headlines in selective exposure task

1. Sub-topic: Assault Weapons Ban
 - **It's Time to Ban Assault Weapons** (*Seattle Times*, <http://tinyurl.com/juz6k8w>)
 - **Why Banning Assault Weapons Won't Reduce Gun Violence** (*Los Angeles Times*, <http://tinyurl.com/gnprsyb>)
2. Sub-topic: Gun ownership rates
 - **High Rates of Gun Ownership = High Rates of Gun Deaths** (*Quartz*, <http://tinyurl.com/p69pl56>)
 - **More Gun Owners, and Declining Gun Deaths** (*Washington Post*, <http://tinyurl.com/hcaynu8>)
3. Sub-topic: Campus carry

- **Do We Really Need More Guns on Campus?** (*Forbes*, <http://tinyurl.com/h2vq24h>)
 - **Why I Would Have Liked to Have My Weapon With Me in College** (*New York Times*, <http://tinyurl.com/h6n4ds8>)
4. Sub-topic: Reasons for gun ownership
- **We're Sick of Hearing These Pro-Gun Arguments** (*Rolling Stone*, <http://tinyurl.com/q89c6nl>)
 - **5 Reasons to Own a Gun** (*CNN*, <http://tinyurl.com/j8kqop9>)
5. Sub-topic: Geography of gun deaths
- **States that Vote Republican Have More Gun Deaths** (*The Atlantic*, <http://tinyurl.com/63z6doq>)
 - **States with Gun Control Laws Don't Have Fewer Gun Deaths** (*CBS News*, <http://tinyurl.com/mvq9yhg>)

Supplementary Table 1

Correlations Between Belief Superiority, Belief Confidence, Clarity, and Correctness for Income Inequality (IQ), Study 1a

Variable	1	2	3
1. IQ belief superiority	--		
2. IQ belief confidence	.503***	--	
3. composite of IQ clarity items	.501***	.705***	--
4. composite of IQ correctness items	.544***	.682***	.784***

***Correlation is significant at the 0.001 level (2-tailed).

 $N = 92$

Supplementary Table 2

Correlations Between Belief Superiority, Belief Confidence, Clarity, and Correctness for Size of Federal Government (SFG), Study 1a

Variable	1	2	3
1. SFG belief superiority	--		
2. SFG belief confidence	.419***	--	
3. composite of SFG clarity items	.391***	.703***	--
4. composite of SFG correctness items	.584***	.586***	.740***

***Correlation is significant at the 0.001 level (2-tailed).

N = 95

Supplementary Table 3

Correlations Between Belief Superiority, Belief Confidence, Clarity, and Correctness for Economy and Jobs (EJ), Study 1a

Variable	1	2	3
1. EJ belief superiority	--		
2. EJ belief confidence	.430***	--	
3. composite of EJ clarity items	.336***	.619***	--
4. composite of EJ correctness items	.500***	.659***	.608***

***Correlation is significant at the 0.001 level (2-tailed).

 $N = 88$

Supplementary Table 4

Correlations Between Belief Superiority, Belief Confidence, Clarity, and Correctness for Gun Control (GC), Study 1a

Variable	1	2	3
1. GC belief superiority	--		
2. GC belief confidence	.428***	--	
3. composite of GC clarity items	.316***	.788***	--
4. composite of GC correctness items	.576***	.734***	.717***

** Correlation is significant at the 0.001 level (2-tailed).

N = 91

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