Factual belief polarization between Democrats and Republicans:
Source or epiphenomenon of ideological and affective polarization?

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ABSTRACT

Democrats and Republicans have polarized in their attitudes and their feelings toward each other. Simultaneously, both groups also diverge in their factual perceptions of reality. This experiment examined how this *factual belief polarization* may or may not fuel ideological and affective polarization around income differences, immigration, climate change, and defense spending. Democrats and Republicans were equally or more divided in their beliefs about the present than in their ideals for the future. Corrective information decreased polarization over some ideals, but not policy attitudes. Priming perceptions conversely increased polarization around defense spending, but not other issues. Much remains unclear about the complex relation between factual beliefs and polarization, but measuring ideals and priming beliefs could be promising avenues for future research.

Keywords: Factual beliefs; misperceptions; ideological polarization; affective polarization; survey experiment

INTRODUCTION

American politics has seen a process of polarization between both major parties. Since the 1970s, a large number of moderate Democrats and Republicans in Congress have been replaced by outspoken liberals or conservatives (Hare & Poole, 2014). This elite polarization has also manifested itself among the mass public. Even though the overall variation in Americans' attitudes has remained rather constant over time (Fiorina & Abrams, 2008; Lelkes, 2016), citizens who identify as a Democrat have become more liberal while Republicans have become more conservative (Abramowitz & Saunders, 2008). Perhaps more problematic, both groups have also developed increasingly hostile feelings toward each other (Iyengar et al., 2019). About eight-in-ten American partisans rate adherents of the other party coldly (Pew, 2019) and nearly half even view them as 'immoral people' (Pew, 2016). During this period of increasing polarization, America has also seen a politicization of factual matters regarding issues such as climate change and COVID-19 (e.g., Dunlap et al., 2016). Such controversies demonstrate that Democrats and Republicans are not only divided in their attitudes (i.e., ideological polarization) and their feelings toward each other (i.e., affective polarization), but also in their factual perceptions of reality. Indeed, about three-quarters of Americans believe that Republican and Democratic voters not only disagree over plans and policies, but also on "basic facts" (Pew, 2019). Lee and colleagues (2021) and Rekker (2021/2022) conceptualized the term 'factual belief polarization' for instances in which an objective fact is known according to evidence and expert opinion, but citizens' factual perceptions are nonetheless correlated with their party preference or issue attitudes.

Although the rise of factual belief polarization may have coincided with increasing levels of ideological and affective polarization, the causal relation between both developments is highly ambiguous. Intuitively, it seems plausible that factual belief polarization could be an important *source* of ideological and affective polarization. It for example appears self-evident that people's factual beliefs can shape their attitudes because facts (e.g., the causes of global warming) have direct implications for policies (e.g., reducing CO_2 emissions). Democrats and Republicans could therefore grow apart ideologically as a result of diverging factual beliefs. A shared sense of reality may also constitute a barrier against affective polarization by ensuring at least a basic level of understanding for the other's position. If factual beliefs grow apart, Democrats and Republicans may however start to see the other as detached from reality, which is easier to condemn than mere disagreement. Nonetheless, the empirical evidence for a causal effect of factual belief polarization on ideological and affective polarization is surprisingly sparse and inconclusive. Some experimental studies revealed that people indeed change their attitudes when their perceptions are corrected (e.g., Howell & West, 2009), but other studies found no such effect (e.g., Kuklinski et al., 2000). Moreover, no experimental evidence is available on the effect of factual beliefs about political issues on affective polarization. Instead, experimental studies have so far focused on how affective polarization can be fueled by misperceptions about political opponents rather than issues (e.g., Ahler & Sood, 2018; Lees & Cikara, 2020).

In the light of these mixed findings, the empirical literature cannot rule out the possibility that factual belief polarization should be seen merely as an *epiphenomenon* of ideological and affective polarization (i.e., a byproduct without any causal impact). Indeed, the empirical case for a causal effect of ideology and partisan affect on factual beliefs is much stronger than the evidence for the reversed relation. Decades of research on motivated reasoning have shown unambiguously that people tend to select and interpret factual information in a way that reinforces their identity and attitudes rather than challenging them (e.g., Taber & Lodge, 2006). Moreover, uninformed citizens may use their political attitudes as a heuristic to fill the gaps in their knowledge (Herda, 2013). Democrats and Republicans may therefore have diverged in their factual beliefs simply as a result of growing apart ideologically. Likewise, factual belief polarization may also be fueled by

increasing levels of affective polarization (Broockman et al., 2021). When citizens become more emotionally invested in their political identity and more hostile toward opponents, they may also become increasingly prone to exclusively trust identity-consistent information from in-group members such as partisan media.

This preregistered survey experiment among 2253 American voters therefore examines whether factual belief polarization should be seen as a source of ideological and affective polarization. It expands upon the existing literature in four ways. First, this study follows in the footsteps of previous research by examining if people's issue attitudes can be changed by informing them about four key issues in American politics: the income distribution, the immigrant population, the climate consensus, and the defense expenditure. If factual belief polarization is a source of ideological polarization, this intervention should decrease attitude differences between Democrats and Republicans. Second, this study introduces a novel experimental manipulation that relies on priming factual beliefs rather than correcting them. If polarization of factual beliefs is a source of ideological polarization, priming such perceptions may increase attitude differences between Democrats and Republicans. It is crucial to explore such alternative ways to examine the attitudinal effects of factual perceptions because the observation that corrective information often fails to change people's views cannot be taken as evidence that factual beliefs themselves have no effect. Attempts to correct perceptions may invoke a defensive reaction from participants so that they either reject the corrections directly or refuse to adjust their attitudes. Third, this study describes not just citizens' factual beliefs (e.g., 'what is currently the income distribution?') and policy attitudes (e.g., 'should the government redistribute incomes?'), but also their ideals (e.g., 'what would be the fairest distribution of incomes?'). This makes it possible to compare on a common metric if Democrats and Republicans are more divided in their beliefs about the present or in their ideals for the future. Ideals may also shed a light on the reasons why directional policy attitudes may or may not be rooted in factual beliefs. Fourth and finally, this study examines if correcting and priming factual perceptions can alter not just ideological but also affective polarization.

THEORY AND HYPOTHESES

Political polarization over factual beliefs

Political polarization is an umbrella term for various forms of political dividedness. Although the literature on polarization has commonly distinguished between ideological and affective polarization, the politicization of scientific knowledge about issues such as climate change and COVID-19 has made clear that political opponents are often divided not only in their attitudes and their feelings toward each other, but also in their factual beliefs about reality. In one of the few articles that have systematically conceptualized this phenomenon, Lee and colleagues (2021) introduced the term 'factual belief polarization' to refer to this type of dividedness. Whereas ideological polarization refers to people's attitudes about *what ought to be*, factual belief polarization refers to differential perceptions of *what is*. Factual belief polarization occurs when an objective fact is known according to evidence and expert opinion, but citizens' factual perceptions are nonetheless correlated with their party preference or issue attitudes (Rekker, 2022).

Factual belief polarization is closely related to the concept of 'misperceptions,' which were defined by Nyhan and Reifler (2010: 305) as "cases in which people's beliefs about factual matters are not supported by clear evidence and expert opinion." Most (though not all) studies have defined misperceptions as incorrect beliefs that people hold with confidence (e.g., Flynn et al., 2017; Kuklinski et al., 2000). This criterion distinguishes misperceptions from ignorance, which is defined as lacking a correct belief on an issue. Despite the clear similarities, there are also two

conceptual differences between misperceptions and factual belief polarization (Rekker, 2022). First, misperceptions must in some way be connected to citizens' party preference or issue attitudes in order to qualify as *political* polarization. Second, factual belief polarization does not require that citizens hold their factual perceptions with a strong degree of confidence. Instead, it departs from the idea that citizens' attitudes on key issues are inevitably intertwined with a large multitude of factual beliefs ranging from strong convictions to implicit assumptions. For example, very few people may know the exact share of immigrants in their country's population. However, nearly everyone must know from personal experience that this number is larger than zero percent and smaller than a hundred percent. This implies that almost everyone has at least a rough and implicit assumption about the size of the immigrant population. As it turns out, such assumptions can differ widely between proponents and opponents of immigration (Herda, 2013; Nadeau et al., 1993). This type of polarization over factual beliefs may be consequential regardless of the degree of confidence with which people hold their perceptions. Because of this conceptual distinction between misperceptions and factual belief polarization, both phenomena require a somewhat different research agenda. Research on misperceptions has focused mostly on instances in which citizens confidently hold blatantly inaccurate beliefs such as that Osama bin Laden is still alive or that vaccines cause autism. Such false perceptions are usually the result of explicit misinformation (Nyhan, 2020). The challenge for research on factual belief polarization, however, lies more in identifying the (often implicit) factual assumptions that are intertwined with citizens' attitudes on the most central political issues.

For all four issues in this study, previous research has already established the existence of factual belief polarization. Regarding climate change, 83% of Democrats believe that global warming is caused by human activity, but only 43% of Republicans share this position (Dunlap et al., 2016). Likewise, Republicans assume a more egalitarian income distribution than Democrats (Boudreau & MacKenzie, 2018) and a lower level of defense spending (Lee et al., 2021). On the issue of immigration, opponents perceive a larger share of foreign-born citizens in the population than proponents (Herda, 2013; Nadeau et al., 1993). It is, however, unclear if Democrats and Republicans are more divided in their perceptions of what is or in their ideals about what ought to be. This question could be important because if adherents of both parties are (much) less divided in their factual beliefs than in their normative ideals, factual belief polarization may be a relatively minor factor in the broader issue of political polarization. If Democrats and Republicans are, however, equally or more divided in their beliefs about the present than in their ideals for the future, factual belief polarization could be a potentially important driver of ideological and affective polarization. In one of the few studies that compared beliefs and ideals on a common metric, a survey among Californians found that Democrats and Republicans differ more in their perceptions of income differences than in their ideals about what a fair income distribution would look like (Boudreau & MacKenzie, 2018). Using the same measure, another study found that both groups are about equally divided in their beliefs and ideals about income inequality (Norton & Ariely, 2011). This study expands upon these studies by measuring beliefs and ideals on a common metric about four key issues to address the following question:

RQ1: *How does the magnitude of factual belief polarization between Democrats and Republicans compare to the ideological polarization between both groups?*

Correcting factual beliefs

Factual belief polarization may fuel ideological polarization when people's perceptions inform their attitudes. To what extent this is the case has been addressed by an extensive experimental literature on the correction of misperceptions. These studies examined if participants' policy attitudes can be changed by presenting them with factual information. Such interventions might be effective when two conditions are satisfied: (1) that participants indeed correct their misperceptions and (2) that they see a need to update their policy attitudes in the light of their newly acquired factual knowledge. Regarding the first condition, meta-analytic studies show that corrections are generally effective in reducing misperceptions (Chan et al., 2017; Walter & Murphy, 2008). Although there have been some instances in which the corrections 'backfired' and increased misperceptions (Ma et al., 2019; Nyhan & Reifler, 2010), most studies established that informed participants indeed report more accurate beliefs. It is, however, much less clear if people update not only their perceptions but also their opinions. Some studies revealed that corrective information can induce attitude change (e.g., Howell & West, 2009), but many other studies found no such effect (e.g., Kuklinski et al., 2000).

Regarding income differences, there is some evidence that informing citizens about the income distribution can change their policy attitudes toward redistribution. In a survey experiment among Californians, Republicans increased their support for a progressive income tax after learning about the income inequality in their state (Boudreau & MacKenzie, 2018). This intervention also decreased attitude differences between Democrats and Republicans. In another experiment, participants were more likely to express that it is the government's responsibility to reduce inequality when they had been informed about the income distribution and the rising levels of inequality in the US (McCall et al., 2017). Likewise, another experimental study demonstrated that Americans raised their support for redistribution after learning the magnitude of income differences based on gender, race, and family background (Becker, 2020). Revealing a somewhat different pattern, another survey experiment showed that informed participants updated their ideals about what a fair income distribution would look like, but not their policy attitudes toward redistribution (Trump, 2018).

In a similar vein, another strand of literature has examined the effect of corrective information on policy attitudes toward immigration. On this issue, the available evidence indicates that people's attitudes are highly resistant to change. Survey experiments revealed that informing participants about the racial composition or the share of foreign-born citizens in the US did little to change their attitudes toward immigration, even though the information improved the accuracy of their perceptions (Hopkins et al., 2019; Lawrence & Sides, 2014). A study that compared different information treatments found that Republicans raised their support for legal immigration only when they were informed about characteristics of the immigrant population and not only about its size (Grigorieff et al., 2020). A survey experiment among Danes, however, revealed that participants did not change their attitudes either when they were informed about the size of the immigrant population or about other characteristics (Jørgensen & Osmundsen, 2022).

Research on corrective information and climate change attitudes has been inspired largely by the 'gateway belief model' (Van der Linden et al., 2015). This model posits that people can, regardless of their beliefs or ideology, be persuaded that scientist agree on anthropogenic global warming. The awareness that there is a scientific consensus may, in turn, function as a 'gateway cognition' that also shifts people's own beliefs about climate change and eventually their policy attitudes. Corroborating this model, experimental studies have consistently shown that consensus messages can effectively correct people's perceptions of what scientists believe about climate change (Bolsen & Druckman, 2018; Deryugina & Shurchkov, 2016; Van der Linden et al., 2015). It is,

however, much less clear if such consensus perceptions are indeed a gateway to broader attitude change. Several studies found that consensus messages did not change people's own beliefs about climate change or their attitudes toward climate action (Bolsen & Druckman, 2018; Deryugina & Shurchkov, 2016; Dixon et al., 2017). Moreover, some studies suggest that consensus messages can even backfire among conservatives and Republicans, leading them to report lower levels of belief in global warming and less support for climate policies (Bolsen & Druckman, 2018; Cook & Lewandowsky, 2016; Ma et al., 2019). These findings indicate that informing people about climate change may conceivably exacerbate ideological polarization between Democrats and Republicans instead of alleviating it. In sharp contrast, another study however found that consensus messages effectively increased people's belief in global warming and their support for climate action. Moreover, the consensus messages decreased ideological polarization by being more effective among conservatives than among liberals (Van der Linden et al., 2019).

Regarding the issue of defense spending, experimental evidence on the effect of corrective information is currently lacking. There is, however, some evidence that people's policy attitudes can be changed by informing them about the share of spending on other issues. For example, two studies revealed that Americans increased their support for foreign aid spending when they were informed about the share of the federal budget spent on foreign aid (Gilens, 2001; Scotto et al., 2017). Likewise, another study found that people became more supportive of additional science spending after being informed about the share of the federal budget allocated to scientific research (Goldfarb & Kriner, 2017). The ideological distance between Democrats and Republicans was, however, not reduced by this information. Nonetheless, effects of corrective information about federal spending are not consistently found in all studies. For example, another experiment found that informing Americans about the share of the federal budget spent on welfare did not change their attitudes toward welfare spending (Kuklinksi et al., 2000).

In sum, the present study informs participants about the magnitude of income differences, the share of immigrants in the population, the climate consensus, and the share of defense spending. Despite mixed findings, the existing literature provides at least some indications that such corrective information can induce attitude change in a way that decreases ideological polarization between Democrats and Republicans. In addition, this study introduces two additional outcome variables besides policy attitudes. First, this study will ask respondents what situation they would view as ideal (e.g., what share of the federal budget should be spend on defense). A previous study on income differences demonstrated that such ideals might be more responsive to corrective information than directional policy attitudes (Trump, 2018). How informed participants may or may not update their ideals may also shed a light on why corrective information often fails to change people's opinions. Second, this study examines the effect of corrective information not just on ideological but also on affective polarization. It stands to reason that a shared sense of reality can buffer against political hostility by ensuring at least a basic level of understanding for the other's position. If this is the case, informing people about facts may conceivably bring down the level of affective polarization between political opponents. When informed about the true magnitude of income inequality, a Republican who previously underestimated income differences may, for example, become more understanding of Democrats who support government redistribution. In line with this reasoning, an observational study established that factual belief polarization and affective polarization often go together (Rekker & Harteveld, 2022). Moreover, experimental research revealed that corrective information about the views and characteristics of political opponents (as opposed to political issues) can decrease affective polarization (e.g., Ahler & Sood, 2018; Lees & Cikara, 2020). In sum, the first hypothesis is postulated as follows:

H1: *Informing people with corrective information decreases ideological (H1a) and affective polarization (H1b) between Democrats and Republicans.*

Priming factual beliefs

Although experimental studies on corrective information have yielded valuable insights in the role of factual beliefs in attitude formation, this research design is not without its limitations. Most crucially, the observation that corrections of misperceptions often fail to change attitudes cannot be taken as evidence that factual beliefs *themselves* have no effect. As Flynn, Nyhan and Reifler (2017) put it: "misperceptions can have important consequences for policy debate and public attitudes even if correcting them does not change people's opinions." Specifically, corrective information may often fail to change people's views because it invokes a defensive psychological reaction that is known as 'reactance.' Reactance occurs when people experience a threat to their agency or freedom and respond to a message with hostility and counter arguing (Rains & Turner, 2007). Such a response can be triggered when corrective information is overtly persuasive or when people perceive a threat to their attitudes and identity (Dillard & Shen, 2005). For example, Republicans and climate sceptics often report feeling 'pressured,' 'manipulated,' and 'forced into beliefs about climate change' when they are informed about the climate consensus (Chinn & Hart, 2021; Ma et al., 2019).

In the light of these limitations of corrective information, there is a need for alternative ways to examine the attitudinal effects of factual belief polarization. As a potential solution, the present study examines the causal effect of factual beliefs on attitudes not only by correcting people's perceptions, but also by merely priming them. Factual beliefs can be primed by asking participants first about their beliefs and then about their policy preferences. As a result of this question order, participants express their policy attitudes with their factual beliefs in mind (Kuklinski et al., 2000; Tourangeau et al., 2000). If factual belief polarization is a source of ideological and affective polarization, this priming method may increase attitudinal differences and hostility between Democrats and Republicans. When primed with their high perception of income inequality, Democrats may, for example, report greater support for redistributive policies and more hostility toward opponents of redistribution. Conversely, primed Republicans may decrease their support for redistribution because they typically assume a more egalitarian income distribution. In other words, the second hypothesis is as follows:

H2: *Priming people with their factual beliefs increases ideological (H2a) and affective polarization (H2b) between Democrats and Republicans.*

METHOD

Sample

The participants of this study are 2253 eligible American voters who were recruited through Prolific and completed the survey on 22 January 2022. Quota sampling was used to obtain a representative sample with regard to vote choice in the 2020 presidential elections: 743 non-voters, 789 Biden-voters, and 721 Trump-voters. Although this method cannot guarantee representativeness with regard to other characteristics than vote choice, the analysis in Appendix 1 indicates that the recruited sample is very similar to the representative probability sample of the 2020 American National Election Studies (ANES) with regard to gender, educational level, party identification, and political interest. The only clear difference between both samples lies in the age distribution: whereas older voters are overrepresented in the ANES, younger voters are overrepresented in the present sample. Prior to the data collection, this study (including a pre-analysis plan) was preregistered on OSF and approved by the ethics committee of [ANONIMIZED].

Measures

Respondents' *party identification* was measured with three items that were adopted from the ANES. The first question asks respondents if they think of themselves as a Democrat, a Republican, an independent, or an adherent of another party. Participants who identify with either of the two parties are then asked if their identification is 'strong' or 'very strong.' The remaining respondents are instead asked if they think of themselves as 'closer' to either of the two parties. Following the ANES, the answers on these three questions were recoded into a 7-point party identification scale ranging from strong Democrat (1) to strong Republican (7).

For the issue of *income differences*, respondents' factual beliefs were measured with the item: "When you think about the amount of money that a family can spend after taxes, how many times more do you think the 10% households with the highest incomes earn compared to the 10% households with the lowest incomes?" Respondents' ideals were measured with the same question, except that it asked them not about the current distribution of incomes, but rather how many times more the households with the highest incomes 'should earn.' To avoid steering answers with response scales, participants were asked to indicate their beliefs and ideals about all issues by typing a number in an open field. Respondents' policy attitudes about income differences were measured with an item that was adopted from the General Social Survey: "What score between 1 (government ought to reduce the income differences between rich and poor) and 7 (government should not concern itself with reducing income differences) comes closest to the way you feel?" For all policy attitudes, respondents provided their answer on a 7-point scale.

Respondents' beliefs about *immigration* were measured with the question: "What do you think is currently the share of immigrants in the United States? By immigrants, we mean people who were born in another country as well as their children, but not their grandchildren." Participants' ideals about immigration were inquired with a similar item that asked what 'would be an ideal share of immigrants.' The question about policy attitudes toward immigration asked respondents if the US 'should admit fewer or more immigrants.'

For the issue of *climate change*, participants were asked "How convinced are you that climate change is mainly caused by human activity? Please place yourself on a scale from 0% to 100% where 0% means that you think it is extremely unlikely that climate change is caused mainly by human activity, 100% means that you are sure that climate change is caused mainly by human activity, and 50% means that you are unsure." Ideals about climate change were examined by asking respondents: "In order to justify extensive government spending and regulations to stop global climate change, how certain do you think we have to be that climate change is indeed caused mainly by human activity?" Policy attitudes about climate change were inquired with the question: "Do you think the United States should do less or more in terms of spending and regulations to stop global climate change?"

Factual beliefs about *defense spending* were measured by asking respondents: "When you think about the entire annual budget of the federal government, what percentage do you think is currently spent on defense?" Participants' ideals were inquired with the question what percentage of the federal budget 'should be spent on defense.' The question about policy attitudes toward defense spending was phrased: "Do you think the United States should decrease or increase defense spending?"

This study furthermore examined *affective polarization* by presenting respondents with the 'feeling thermometer' that was popularized by the ANES. On a feeling thermometer, respondents can indicate how they feel about different groups of people with a temperature ranging from 0

(very cold or unfavorable) to 100 degrees (very warm and favorable). Using a slider, respondents rated their feelings toward Democrats and Republicans, as well as toward proponents and opponents of each of the four issues (e.g., "How would you rate people who think the United States should increase defense spending?"). The absolute difference between respondents' rating of both groups was taken as a measure of affective polarization.

Procedure

The procedure of this study is depicted in Figure 1. Because the experimental treatments require a basic understanding of math from participants, the first part of the questionnaire was a screening that consisted of three basic math questions about ratios and percentages. Participants then answered some demographic questions and the items about party identification. For respondents who failed to answer at least two of the three screening questions correctly (N = 199; 8.8%), the survey ended here. The remaining participants (N = 2,054; 91.2%) were randomly assigned to one of three experimental conditions: a control condition, a priming condition, and a correction condition. Randomization checks confirmed that the assigned condition was unassociated with gender (p = .90), race (p = .84), educational level (p = .94), liberal-conservative ideology (p = .58), and political interest (p = .25).

For each of the four issues, participants in the *control condition* were first asked about their policy attitude, second about their feelings toward people on both sides of the debate, third about their ideal, and fourth about their factual belief. In the *priming condition*, this question was reversed: first the belief, second the ideal, third the policy attitude, and fourth the feeling thermometer. The idea behind this question order is that participants are primed with their factual perceptions in the first question, while the second question then makes them aware of the distance between their belief and their ideal. As a result, it is likely that participants will use this primed discrepancy to answer the question on their policy attitude. For example, a respondent who has indicated in the first question that (s)he believes the share of immigrants in the United States is currently 40% and in the second question that (s)he thinks this should be 20%, may answer in the third question that the US should admit fewer immigrants as a logical consequence of this discrepancy.

The question order in the *correction condition* resembled the priming condition, except that the question about beliefs was replaced by factual information. For income differences, the presented information was: "When it comes to the distribution of incomes in the United States, official statistics by the OECD show that the amount of money that a family can spend after taxes is *18 times* higher for the 10% households with the highest incomes compared to the 10% households with the lowest incomes." Regarding immigration, participants were informed that: "According to population surveys, immigrants make up *26%* of the population in the United States." Likewise, participants were informed about the scientific consensus on climate change: "The consensus among climate scientists is that it is *more than 99% sure* that climate change is caused mainly by human activity." On the issue of defense spending, the presented information was: "According to the Congressional Budget Office, the federal government spends *11%* of its entire annual budget on defense." The factual information in these messages was based respectively on reports from the OECD (2016), Pew Research (2020), the IPCC (2021), and the CBO (2021). As the final question in each condition, respondents rated their feelings toward Democrats and Republicans on a feeling thermometer.

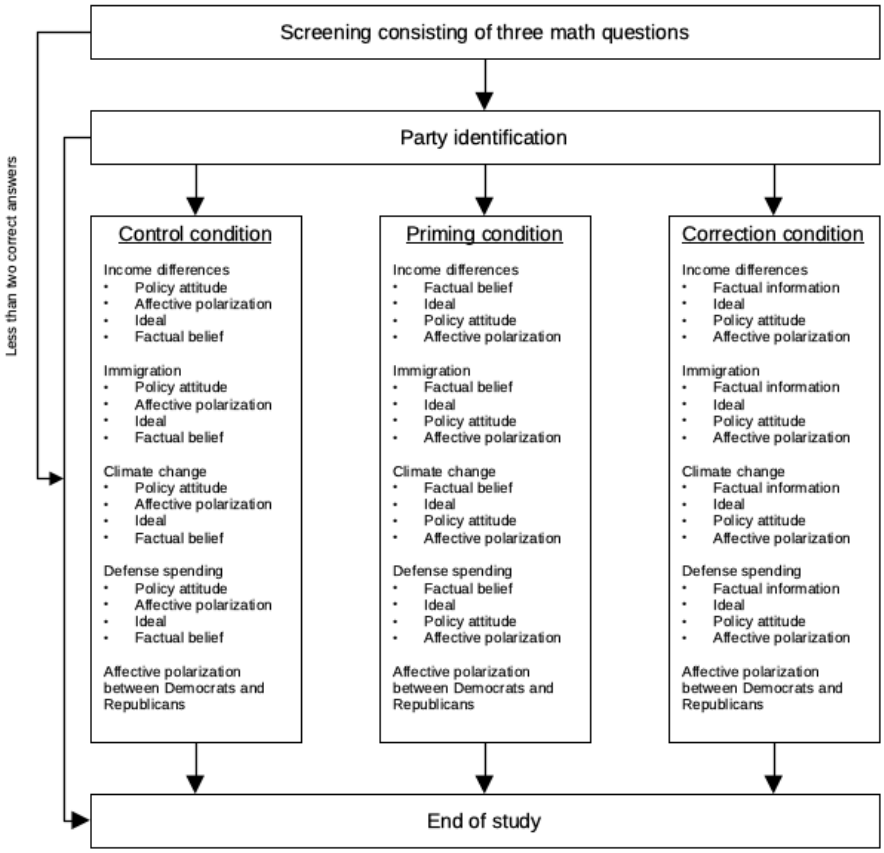

Figure 1. *Procedure of the survey experiment.*

ANALYSES AND RESULTS

Political polarization over factual beliefs

Table 1 displays a series of ordinary least squares regression analyses with heteroscedasticity robust standard errors. The research question how the magnitude of factual belief polarization compares to ideological polarization (RQ1) was examined using models in which the dependent variable was a merged variable that indicates the ideals of respondents in the control condition and the beliefs of respondents in the priming condition. This approach ensured that none of the hypothesized question order effects could influence the results for this descriptive research question. The direction of the scores on beliefs and ideals was synchronized so that higher scores reflect the Republican viewpoint. The predictors were a dummy indicating which question respondents answered (beliefs or ideals), party identification, and an interaction between both variables. For three out of the four issues, the estimated interaction effect reveals that Democrats and Republicans were equally or more divided in their beliefs than in their ideals. On the issue of climate change, both groups were significantly further apart in their beliefs than in their ideals and a non-significant effect in the same direction was found for income differences and defense spending. Immigration was the only issue on which Democrats and Republicans were, conversely, more divided in their ideals than in their beliefs.

To better understand these findings, Figure 2 compares the median ideals and beliefs of Democrats and Republicans (i.e., weak and strong identifiers). Interestingly, this graph tells a different story for each issue. About the income distribution, Democrats and Republicans differ widely in their

factual perceptions and the median voter substantially underestimates income inequality. However, Democrats and Republicans do agree on the fundamental issue that income differences are currently larger than they ideally should be. For immigration, Figure 2 depicts the normatively ideal situation that Democrats and Republicans differ only in their ideals, but not in their factual beliefs because both groups have a rather accurate perception. Regarding climate change, Democrats and Republicans are to some extent divided over the question how much certainty would be needed to justify spending and regulations, but they are clearly much more divided over the factual question whether or not global warming is manmade. Finally, adherents of both parties overestimate the amount of defense spending, but Democrats overestimate the actual number much more than Republicans. Participants clearly provided higher numbers as perceptions than as ideals on this issue. Republicans would ideally spend more money on defense than Democrats, but even the ideals of strong Republicans do not exceed their perceptions of the current expenditure.

Correcting factual beliefs

To test the hypothesis that corrective information can decrease ideological and affective polarization between Democrats and Republicans (H1), this study included a set of regression models in which the subsequent dependent variables were participants' ideals, policy attitudes, and affective polarization around issues and partisanship. The independent variables in the models on ideological polarization were experimental condition, party identification, and an interaction between both variables (see Table 1). The models on affective polarization featured only condition as predictor. The results for ideals revealed that corrective information significantly reduced the ideological distance between Democrats and Republicans on the issues of income differences and defense spending, but not immigration and climate change. In sharp contrast, the results however revealed no significant interaction between the correction condition and party identification for any of the four policy attitudes. These null results also extend to affective polarization around three of the four issues and partisanship. On the issue of defense spending, the corrective information unexpectedly increased affective polarization.

To interpret these findings, Table 2 and Figure 3 provide a separate comparison between the conditions for Democrats and Republicans. The results show that neither Democrats nor Republicans changed their policy attitudes when they were informed about income inequality. However, the explanation for this null effect may differ between both groups. Figure 2 suggests that corrective information may have been unconvincing for Republicans because they do not believe a discrepancy between the current and ideal level of inequality justifies government intervention. Meanwhile, many Democrats may have had little reason to update their attitudes because their perception was already close to the actual number. Likewise, corrective information may have failed to change immigration attitudes because both Democrats and Republicans already had a fairly accurate perception of the immigrant population. Regarding climate change, Figure 2 shows that the median Republican believes that about 75% certainty would be needed to justify climate action. Nonetheless, Republicans did not update their opinions when they were informed that the actual certainty is 'at least 99%.' In fact, the results even reveal a marginally significant 'backfire effect' in which informed Republicans raised their opposition to climate policies. Many informed Republicans also increased their required level of certainty for climate action, perhaps as a way to rationalize not changing their policy attitudes. On the issue of defense spending, Democrats and Republicans responded to corrective information by bringing their ideal level of spending closer to the actual number. Informed Democrats typically indicated an ideal that is slightly lower than the current defense expenditure, while most Republicans provided a somewhat higher number. This pattern suggests that both Democrats and Republicans updated their ideals to make them consistent with their policy attitudes.

Priming factual beliefs

The aforementioned regression analyses were also used to test the hypothesis that priming beliefs can increase ideological and affective polarization between Democrats and Republicans (H2). Contrary to expectations, the models in Table 1 reveal no significant interaction between the priming condition and party identification for either ideals or policy attitudes on any of the four issues. Participants in the priming condition did, however, differ from the control condition in their levels of affective polarization around two of the four issues. As theorized, participants who were primed with their perceptions of defense spending expressed more affective polarization around this issue. The analyses in Table 2 indicate that this effect was mostly driven by Democrats, who on average raised their affective polarization with a considerable effect size of 10 degrees. This effect was also visible in the policy attitudes of Democrats, who increased their opposition to defense spending. Based on Figure 2, this effect may be explained by the pattern that the median Democrat greatly overestimates the actual defense expenditure. When primed with this belief, many Democrats seem to double down on their opposition to defense spending. On the issue of climate change, participants in the priming condition unexpectedly indicated lower levels of affective polarization compared to the control condition. This effect was not significant for either Democrats or Republicans separately, but Table 2 hints that especially Republicans became less affectively polarized by reflecting on their own climate change beliefs.

Manipulation checks

The various null results for priming may either indicate that factual beliefs have no effect in these instances or that that the manipulation was ineffective. Because priming involves an unconscious cognitive process, it is unfortunately not possible to distinguish between both possibilities with a manipulation check. For the information treatment, a *direct* manipulation check would have asked respondents about their own perception after they had just been informed about the actual number. Such a question could appear strange to participants or force them to communicate in a rather artificial way if they accepted or rejected the information. Instead, this study therefore relied on an *indirect* manipulation check by examining the main effect of the information treatment on respondents' ideals. Previous research has demonstrated that participants use factual perceptions as an anchor for their ideals (Pedersen & Mutz, 2019). The strong main effects of the information treatment on ideals, therefore, demonstrate that the manipulation was successful and that participants processed the information. In this light, the null results for corrective information indicate that informed participants changed their perceptions but not their opinions.

Robustness checks

The presented analyses deviate in three ways from the preregistration. First, the pre-analysis plan proposed an analysis across all issues simultaneously, in addition to models for each separate issue. This pooled analysis was dropped because it would be uninformative in the light of the results, which differed more between issues than expected in both size and direction. Second, the preregistration proposed to recode extreme scores, but this step could be omitted because outliers did not meaningfully alter the results. The third deviation from the pre-analysis plan is the inclusion of ideals as an additional outcome variable for the effect of corrective information and priming. The pre-registered analyses, which are displayed in Appendix 2, yield similar results and conclusions as the presented main analyses.

Table 1. *Regression models for the main analyses.*

Dependent variable: Beliefs (priming condition) or ideals (control condition) in synchronized direction					
	Income differences	Immigrant population	Climate change	Defense spending	
Party identification (centered)	2.70 (0.49)***	2.83 (0.31)***	2.40 (0.57)***	2.09 (0.24)***	
Belief (ref = Ideal)	53.23 (1.76)***	-47.20 (0.98)***	-26.93 (1.61)***	45.66 (0.94)***	
Belief*Party identification	0.82 (0.84)	-2.97 (0.43)***	6.44 (0.74)***	0.41 (0.42)	
Model					
Respondents	1,337	1,337	1,337	1,337	
R^2	43.4%	63.2%	32.5%	64.9%	
Dependent variable: Ideals					
	Income differences	Immigrant population	Climate change	Defense spending	
Party identification (centered)	2.70 (0.49)***	-2.83 (0.31)***	2.40 (0.57)***	2.09 (0.24)***	
Condition (ref = Control)					
Primed with belief	-2.67 (1.28)*	-1.15 (1.01)	2.04 (1.68)	4.14 (0.85)***	
Informed about facts	-7.14 (1.11)***	0.66 (0.88)	9.11 (1.65)***	-8.46 (0.60)***	
Condition*Party identification					
Primed with belief*Party identification	-1.12 (0.60)$^+$	-0.25 (0.44)	-0.47 (0.80)	-0.13 (0.38)	
Informed about facts*Party identification	-1.67 (0.51)**	-0.48 (0.38)	0.34 (0.77)	-0.57 (0.27)*	
Model					
Respondents	2,054	2,054	2,054	2,054	
R^2	7.0%	12.7%	4.3%	21.2%	
Dependent variable: Policy attitudes					
	Income differences	Immigrant population	Climate change	Defense spending	
Party identification (centered)	0.62 (0.03)***	-0.53 (0.03)***	-0.62 (0.03)***	0.42 (0.03)***	
Condition (ref = Control)					
Primed with belief	0.17 (0.09)*	0.15 (0.08)$^+$	0.02 (0.09)	-0.44 (0.08)***	
Informed about facts	0.24 (0.09)**	0.02 (0.08)	0.15 (0.09)	-0.15 (0.09)$^+$	
Condition*Party identification					
Primed with belief*Party identification	0.01 (0.04)	0.04 (0.04)	0.02 (0.04)	0.05 (0.04)	
Informed about facts*Party identification	-0.02 (0.04)	0.02 (0.04)	0.05 (0.04)	0.05 (0.04)	
Model					
Respondents	2,054	2,054	2,054	2,054	
R^2	41.2%	33.5%	39.7%	28.6%	
Dependent variable: Affective polarization					
	Income differences	Immigrant population	Climate change	Defense spending	Partisan polarization
Condition (ref = Control)					
Primed with belief	-0.73 (1.77)	-0.68 (1.82)	-4.56 (1.91)*	3.89 (1.86)*	-1.28 (1.67)
Informed about facts	0.03 (1.77)	-2.21 (1.79)	-2.27 (1.87)	5.11 (1.85)**	-1.56 (1.65)
Model					
Respondents	2,054	2,054	2,054	2,054	2,054
R^2	0.0%	0.1%	0.28%	0.4%	0.1%

Note. Estimates with standard errors in parentheses. $^+$ p < .10; * p < .05; ** p < .01; *** p < .001. Higher scores on policy attitudes indicate less support for redistribution and more support for immigration, climate action, and defense spending.

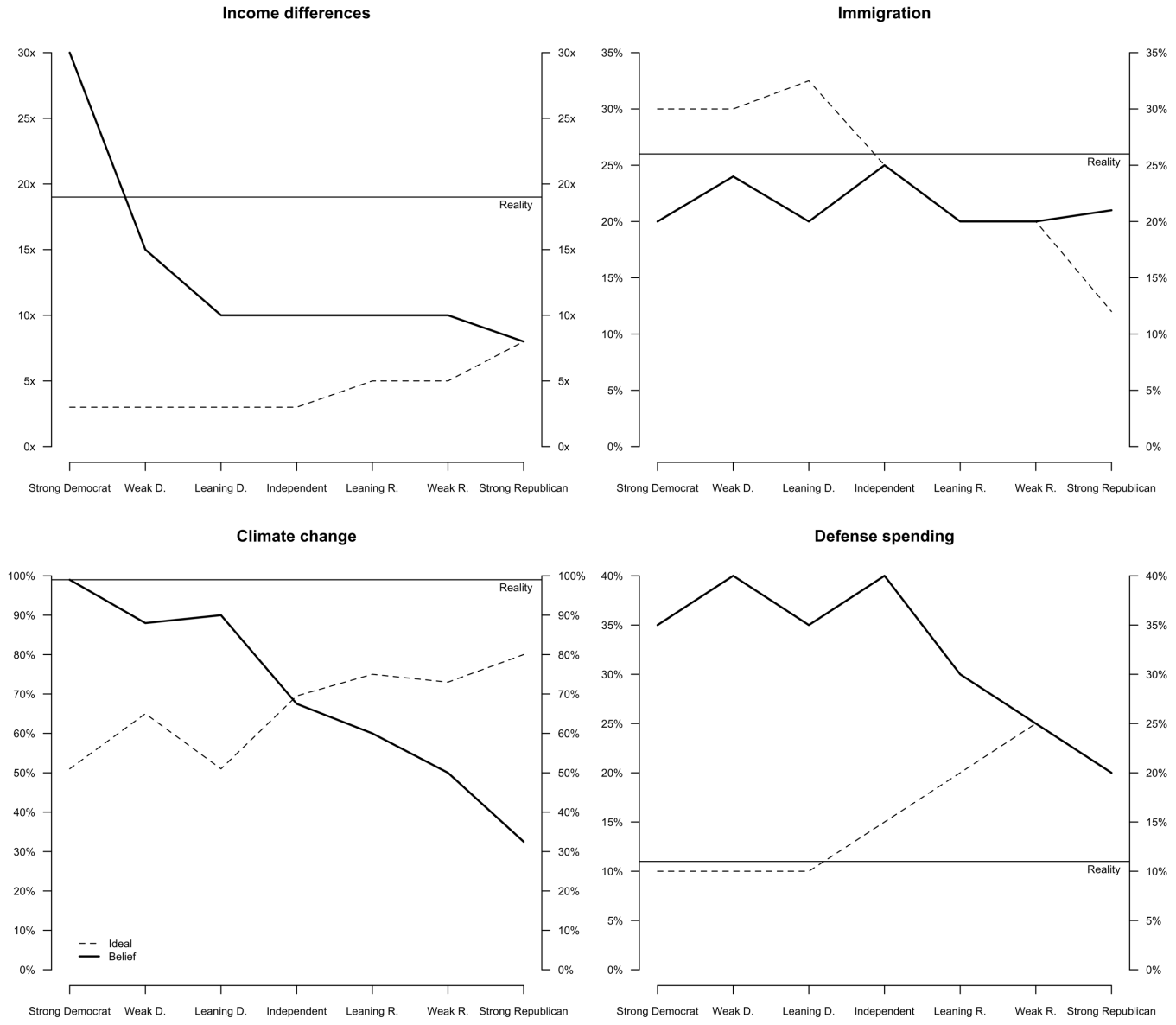

Figure 2. *Median scores on ideals (obtained from control condition) and factual beliefs (obtained from priming condition) by party identification.*

Table 2. *Differences between experimental conditions by party identification.*

Dependent variable: Ideals					
Democrats	Income differences	Immigrant population	Climate change	Defense spending	
Condition (ref = Control)					
Primed with belief	-0.00 (1.16)	0.15 (1.66)	1.01 (2.69)	4.24 (1.11)***	
Informed about facts	-3.40 (1.00)***	2.68 (1.40)$^{+}$	7.42 (2.73)**	-6.75 (0.75)***	
Model					
Respondents	788	788	788	788	
R^2	2.2%	0.5%	1.2%	15.5%	
Dependent variable: Ideals					
Republicans	Income differences	Immigrant population	Climate change	Defense spending	
Condition (ref = Control)					
Primed with belief	-5.50 (3.08)$^{+}$	-1.31 (1.61)	-1.31 (3.11)	2.50 (1.66)	
Informed about facts	-11.86 (2.63)***	0.32 (1.38)	9.49 (2.93)**	-9.95 (1.19)***	
Model					
Respondents	564	564	564	564	
R^2	3.8%	2.6%	2.8%	13.5%	
Dependent variable: Policy attitudes					
Democrats	Income differences	Immigrant population	Climate change	Defense spending	
Condition (ref = Control)					
Primed with belief	0.13 (0.11)	0.01 (0.13)	-0.01 (0.08)	-0.58 (0.13)***	
Informed about facts	0.16 (0.12)	-0.09 (0.13)	0.09 (0.08)	-0.30 (0.13)*	
Model					
Respondents	788	788	788	788	
R^2	0.3%	0.1%	0.2%	2.6%	
Dependent variable: Policy attitudes					
Republicans	Income differences	Immigrant population	Climate change	Defense spending	
Condition (ref = Control)					
Primed with belief	0.26 (0.17)	0.21 (0.16)	0.06 (0.20)	-0.25 (0.16)	
Informed about facts	0.03 (0.17)	0.02 (0.16)	0.36 (0.20)$^{+}$	-0.05 (0.16)	
Model					
Respondents	564	564	564	564	
R^2	0.5%	0.4%	0.7%	0.5%	
Dependent variable: Affective polarization					
Democrats	Income differences	Immigrant population	Climate change	Defense spending	Partisan polarization
Condition (ref = Control)					
Primed with belief	-0.88 (2.60)	1.83 (2.68)	-2.46 (2.41)	10.10 (2.98)***	0.23 (2.44)
Informed about facts	-1.57 (2.59)	-1.08 (2.72)	-2.36 (2.39)	6.04 (2.97)*	0.47 (2.40)
Model					
Respondents	788	788	788	788	788
R^2	0.1%	0.2%	0.2%	1.5%	0.0%
Dependent variable: Affective polarization					
Republicans	Income differences	Immigrant population	Climate change	Defense spending	Partisan polarization
Condition (ref = Control)					
Primed with belief	2.83 (3.25)	-0.00 (3.69)	-4.28 (3.51)	0.34 (3.31)	-0.34 (3.28)
Informed about facts	3.39 (3.32)	-2.91 (3.59)	-1.15 (3.47)	4.28 (3.33)	-1.27 (3.22)
Model					
Respondents	564	564	564	564	564
R^2	0.2%	0.2%	0.3%	0.4%	0.0%

Note. Estimates with standard errors in parentheses. $^{+}$ p < .10; * p < .05; ** p < .01; *** p < .001. Higher scores on policy attitudes indicate less support for redistribution and more support for immigration, climate action, and defense spending.

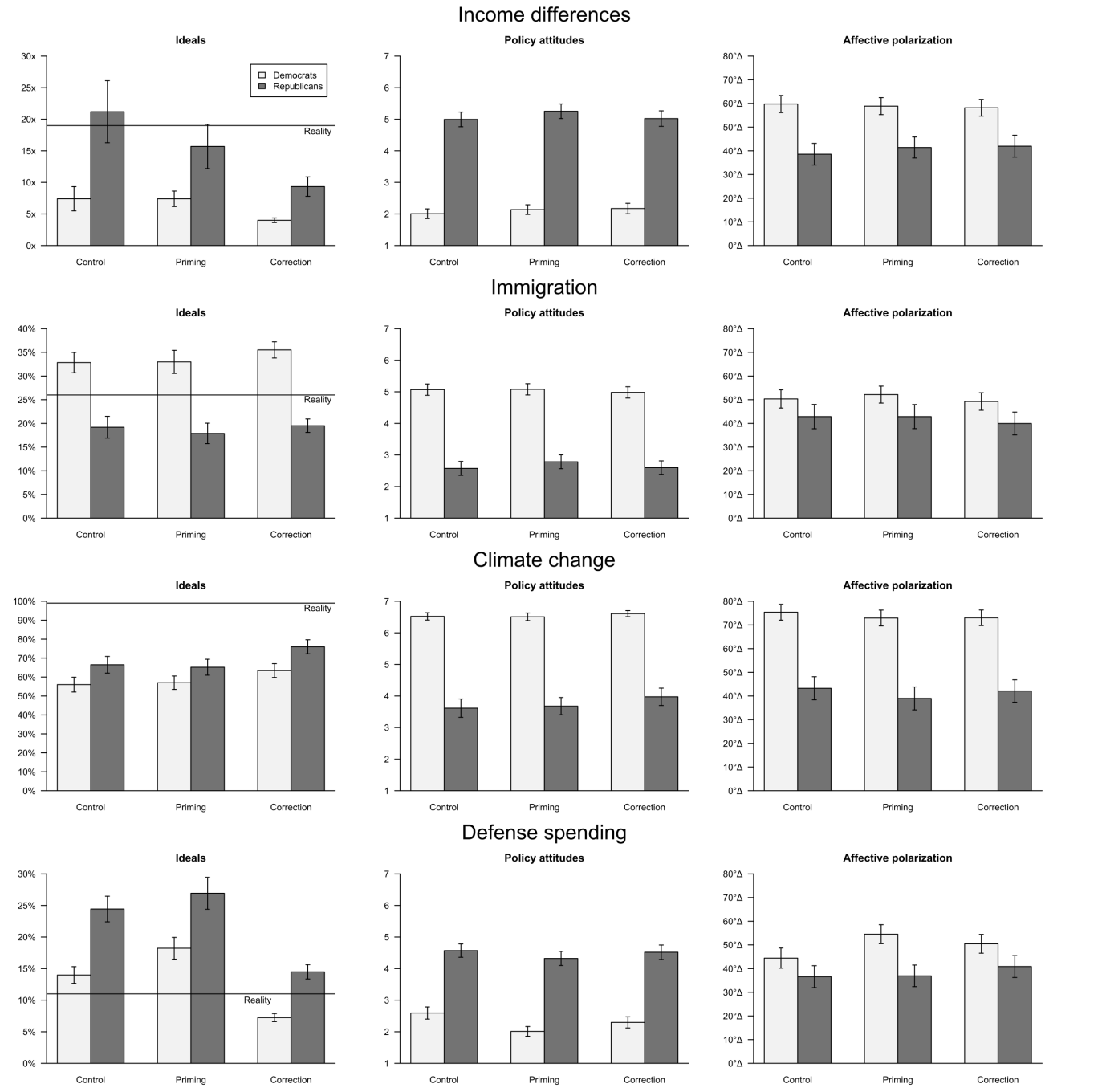

Figure 3. *Scores by experimental condition and partisanship with a 95% confidence interval.*

DISCUSSION

American politics has for some time been characterized by growing animosity and attitudinal differences between Democrats and Republicans. At the same time, both groups also seem to diverge in their factual perceptions of reality. This survey experiment examined whether this factual belief polarization could fuel ideological and affective polarization, or if it is best thought of as an epiphenomenon of these processes. First of all, the descriptive analyses demonstrated that, on all issues except immigration, Democrats and Republicans are equally or more divided in their beliefs about the present than in their ideals for the future. This finding resembles results from previous research that compared beliefs and ideals about the income distribution (Boudreau & MacKenzie, 2018; Norton & Ariely, 2011). Although it does not in itself say anything about the direction of causality, the considerable magnitude of factual belief polarization suggests that it at least has a potential to reinforce ideological and affective polarization.

Nonetheless, this study found no evidence that informing Democrats and Republicans with factual information can bring them closer together in either their policy attitudes or their feelings toward each other. Corrective information did, however, reduce the distance between Democrats' and Republicans' ideals about income inequality and defense spending. Overall, this study's findings are therefore consistent with a previous study which revealed that corrective information on income inequality can change people's ideals, but not directional policy attitudes (Trump, 2018). This emphasizes that, in addition to policy attitudes, ideals are a useful outcome variable for examining the effect of corrective information. Moreover, the inclusion of ideals exposed two potential mechanisms through which corrective information can fail to shift policy attitudes. First, people can view their own ideals as irrelevant to policies. In such instances, people have no reason to update their policy attitudes when corrective information alters the distance between their beliefs and ideals. For example, most Republicans expressed relatively egalitarian ideals about the income distribution compared to both their perceptions and the actual level of inequality. However, Republicans generally seem to view these ideals as irrelevant for their policy attitudes and fundamentally reject the idea of government redistribution. Second, corrective information can fail to change policy attitudes when people update their ideals to maintain and rationalize their policy attitudes. When Democrats were informed about the current defense expenditure, they simply decreased their ideal level of spending to maintain their position that defense spending should be decreased. Similarly, Republicans who were informed about the climate consensus raised their ideals about how much certainty would be needed to justify climate action.

Crucially, the observation that corrections of misperceptions often fail to change attitudes cannot be taken as evidence that factual beliefs *themselves* have no effect. As an alternative way to examine the attitudinal effects of factual belief polarization, this study proposed and tested an experimental manipulation of priming participants' perceptions. As theorized, primed participants expressed higher levels of affective polarization around the defense expenditure. The magnitude of this effect was considerable among Democrats, who also reinforced their negative policy attitudes toward defense spending. This finding suggests that factual belief polarization could be a source of ideological and affective polarization around this issue, even though corrective information failed to bring Democrats and Republicans closer together. It should, however, also be emphasized that the effects of priming were far from consistent across all issues and outcome measures. For immigration, the lack of a priming effect may be explained by the fact that Democrats and Republicans had similar beliefs about the immigrant population to begin with. However, both groups clearly differed in their factual beliefs about income differences and climate change, but priming these perceptions did not increase ideological or affective polarization.

This study departed from the question if factual belief polarization is a source of ideological and affective polarization between Democrats and Republicans, or merely an epiphenomenon. Previous research on this question has yielded mixed findings and the present study was no different. The many null results of the information treatment reaffirm the limitations of this method in examining the attitudinal effects of factual beliefs. This study, however, also demonstrated that priming factual beliefs could be a promising method to obtain a better understanding of the attitudinal effects of factual belief polarization. Although this method yielded significant results for only one of the four examined issues, this finding nonetheless suggests that there are instances in which the addition of a priming condition can identify effects that would remain undetected with only an information treatment. By measuring ideals, this study furthermore identified two potential mechanisms through which corrective information can fail to shift policy attitudes. It is clear that much more research is needed before the complex relation between factual beliefs and polarization can be fully understood. In this ongoing debate, measuring ideals and priming beliefs could prove to be valuable additions to the methodological toolkit.

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Appendix 1. *Representativeness.*

	Present study	ANES 2020	Population estimate
Turnout in 2020 presidential election			
Voted	67%	86%	67%
Did not vote	33%	14%	33%
Vote choice in 2020 presidential election			
Joe Biden	52%	68%	51%
Donald Trump	48%	30%	47%
Other candidate	0%	2%	2%
Gender			
Male	41%	46%	48%
Female	59%	54%	52%
Age			
18 through 24	24%	5%	12%
25 through 39	42%	25%	26%
40 through 64	30%	42%	43%
65 and older	5%	28%	19%
Education			
Less than high school credential	1%	5%	NA
High school graduate - High school diploma or equivalent (e.g. GED)	16%	16%	NA
Some college but no degree	24%	21%	NA
Associate degree in college - occupational/vocational	6%	8%	NA
Associate degree in college - academic	5%	6%	NA
Bachelor's degree (e.g. BA, AB, BS)	34%	25%	NA
Master's degree (e.g. MA, MS, MEng, MEd, MSW, MBA)	11%	15%	NA
Professional school degree (e.g. MD, DDS, DVM, LLB, JD)/Doctoral degree (e.g. PHD, EDD)	3%	5%	NA
Race			
White	81%	NA	NA
Non-white	19%	NA	NA
Party identification			
Democrat	38%	35%	NA
Republican	28%	31%	NA
Independent	31%	31%	NA
Other party	4%	3%	NA
Interest in politics			
Very interested	23%	25%	NA
Somewhat interested	48%	49%	NA
Not very interested	21%	19%	NA
Not at all interested	8%	8%	NA

Appendix 2. *Preregistered analyses.*

	Dependent variable: Z-scores on belief (priming condition) or ideal (control condition)				
	Income differences	Immigrant population	Climate change	Defense spending	Across issues
Party identification (z-score)	0.12 (0.02)***	0.20 (0.02)***	0.15 (0.03)***	0.15 (0.02)***	0.15 (0.01)***
Belief (ref = Ideal)	1.31 (0.04)***	-1.59 (0.03)***	-0.83 (0.05)***	1.58 (0.03)***	0.12 (0.02)***
Belief*Party identification	0.06 (0.04)	-0.21 (0.03)***	0.39 (0.04)***	0.03 (0.03)	0.07 (0.02)***
Model					
Respondents	1,337	1,337	1,337	1,337	1,337
Observations					5,348
R^2	45.8%	64.9%	32.5%	65.6%	4.0%

	Dependent variable: Z-scores on policy attitudes				
	Income differences	Immigrant population	Climate change	Defense spending	Across issues
Party identification (z-score)	0.64 (0.03)***	0.60 (0.03)***	0.65 (0.03)***	0.48 (0.03)***	0.59 (0.02)***
Condition (ref = Control)					
Primed with belief	0.08 (0.04)*	-0.07 (0.04)$^{+}$	-0.01 (0.04)	-0.25 (0.04)***	-0.06 (0.03)*
Informed about facts	0.12 (0.04)**	-0.01 (0.04)	-0.07 (0.04)	-0.09 (0.05)$^{+}$	-0.01 (0.03)
Condition*Party identification					
Primed with belief*Party identification	0.01 (0.04)	-0.05 (0.04)	-0.02 (0.04)	0.06 (0.04)	0.00 (0.03)
Informed about facts*Party identification	-0.02 (0.04)	-0.03 (0.04)	-0.05 (0.04)	0.06 (0.05)	-0.01 (0.03)
Model					
Respondents	2,054	2,054	2,054	2,054	2,054
Observations					8,216
R^2	41.2%	33.5%	39.7%	28.6%	35.2%

	Dependent variable: Z-scores on affective polarization around issues				
	Income differences	Immigrant population	Climate change	Defense spending	Across issues
Condition (ref = Control)					
Primed with belief	-0.02 (0.05)	-0.02 (0.05)	-0.13 (0.05)*	0.11 (0.05)*	-0.02 (0.04)
Informed about facts	0.00 (0.05)	-0.07 (0.05)	-0.07 (0.05)	0.15 (0.05)**	0.00 (0.04)
Model					
Respondents	2,054	2,054	2,054	2,054	2,054
Observations					8,216
R^2	0.0%	0.1%	0.3%	0.4%	0.0%

	Dependent variable: Z-scores on partisan affective polarization
Condition (ref = Control)	
Primed with belief	-0.04 (0.05)
Informed about facts	-0.05 (0.05)
Model	
Respondents	2,054
Observations	
R^2	0.1%

Note. Estimates with standard errors in parentheses. $^{+}$ p < .10; * p < .05; ** p < .01; *** p < .001. All dependent variables were standardized to make scores comparable across issues. The direction was synchronized such that a higher score reflects the Republican viewpoint on policy attitudes, beliefs, and ideals.