

**Preregistered Replication of “Feeling superior is a bipartisan issue: Extremity (not direction) of political views predicts perceived belief superiority”**

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### **Abstract**

There is currently a debate in political psychology about whether dogmatism and belief superiority are symmetric or asymmetric across the ideological spectrum. One study found that dogmatism was higher amongst conservatives than liberals, but both conservatives and liberals with extreme attitudes reported higher perceived belief superiority (Toner, Leary, Asher & Jongman-Sereno, 2013). Our goal was to conduct a pre-registered direct and conceptual replication of this previous research using a larger and more nationally representative sample. Consistent with prior research, we found that conservatives had higher dogmatism scores than liberals while both conservatives and liberals with extreme attitudes were associated with higher belief superiority compared to those with more moderate attitudes. Moreover, whether conservative or liberal attitudes were associated with higher belief superiority was topic dependent. Different from prior research, we found that ideologically extreme individuals had higher dogmatism. We discuss the implications of these results for theoretical debates in political psychology.

*Keywords: Replication, Political Psychology, Belief Superiority, Dogmatism, Ideology*

**Preregistered Replication of “Feeling superior is a bipartisan issue: Extremity (not direction) of political views predicts perceived belief superiority”**

A common feature of modern political discourse is that people feel superior about their political beliefs and are often unwilling to compromise. There is considerable debate, however, about which people are particularly dogmatic in their beliefs. In his original treatment on dogmatism, Rokeach said “In the political sphere one can observe expressions of dogmatic conservatism and dogmatic liberalism, dogmatic Marxism and dogmatic anti-Marxism” (1954, pg. 194). In the current research, we examined whether conservatives and liberals were more or less likely to express support for the rigid and intolerant political beliefs as well as a specific sense of belief superiority over their ideological counterparts.

This research speaks to a longstanding debate about ideological differences in cognitive styles. One body of research has found that politically conservative individuals show higher levels of dogmatism, rigidity and need for cognitive closure compared to liberal individuals (Jost, Glaser, Kruglanski & Sulloway, 2003). In contrast, a recent meta-analysis suggests that conservatives and liberals may both engage in similar levels of biased motivated reasoning (Ditto et al., 2019). However, the literature has used a range of different topics and measures making it difficult to determine whether any similarities or differences are due to the specific issues under investigation or a more general disposition (see Baron & Jost, 2019). Our paper examines whether dogmatism and belief superiority are symmetric or asymmetric across the ideological spectrum using a range of measures and issues.

Prior research has examined whether dogmatism and perceived superiority of one’s beliefs is “a partisan issue” (i.e., whether it is more prevalent among conservatives or prevalent in both conservatives and liberals; Toner, Leary, Asher & Jongman-Sereno, 2013). Specifically,

the researchers asked liberals and conservatives to rate their attitudes towards controversial political issues and to report how superior they believed their attitude was compared to others, as well as their general level of dogmatism. Belief superiority involves looking down upon and thinking less of other people's positions, whereas belief certainty does not (Raimi & Jongman-Sereno, 2019) and is distinct from general self-enhancement and resistance to attitude inconsistent information (Hall & Raimi, 2018). People with greater belief superiority tend to think of themselves as more knowledgeable, despite the fact there is a considerable gap between their perceived and actual knowledge (Hall & Raimi, 2018). They are also less likely to attend to information they regard as inferior (Hall & Raimi, 2018).

Belief superiority tends to be higher for both conservatives and liberals with extreme attitudes (Toner et al., 2013; see also Brandt, Evans & Crawford, 2015). Moreover, whether the liberals or conservatives had higher perceived belief superiority varied from issue to issue (Toner et al., 2013). For example, people with very liberal attitudes about healthcare reported higher belief superiority than those with very conservative attitudes. Conversely, people with very conservative attitudes about affirmative action reported higher belief superiority than those with very liberal attitudes. However, conservatives in this same sample reported higher levels of dogmatism than liberals (Toner et al., 2013). In short, prior research has found consistent evidence of an ideological asymmetry in dogmatism despite a symmetry in belief superiority.

We sought to replicate the Toner et al. (2013) study with a number of important changes designed to evaluate the generalizability of this research. First, we sought to replicate the results years later during a period of increasingly high political polarization (Boxell, Gentzkow & Shapiro, 2020). The original study appears to have been well executed and their findings appear likely to replicate. However, the recent replication rate of psychology papers suggests that we

should not take any outcome for granted (see Open Science Collaboration, 2015; Reiner et al., 2020) and the current political context could elicit differences in political beliefs (see Van Bavel, Mende-Siedlecki, Brady & Reiner, 2016). Second, we examined whether the results held when using alternative measures of political orientation. Using certain measures of political orientation could give rise to different findings in political psychology (e.g., Brandt, Reyna, Chambers, Crawford & Wetherell, 2014; Baron & Jost, 2019; etc.), While the original authors' used an inferred measure of political orientation, self-reported political orientation is not only widely used but it can explain 85% in the variance of self-reported voting behavior (Jost, 2006). Third, we included the issue topic as a random effect in our belief superiority analysis to generalize the results beyond the specific issues tested (Judd, Westfall & Kenny, 2012; see also Cohen, Cohen, West & Aiken, 2013). Fourth, we collected a larger, more representative sample of participants. Much of psychology research using student samples (or MTurk samples) is severely limited in generalizability (see Henrich, Heine, & Norenzayan, 2010). Therefore, collecting a representative (on multiple, but likely not all, dimensions) sample is important for drawing conclusions that are generalizable to all Americans.

## **Methods**

### **Participants**

In their original study, Toner and colleagues (2013) used a large sample of 527 participants that they recruited on Amazon's mTurk. In our replication, we collected a larger sample of participants using Lucid. Lucid uses quota-based sampling to ensure participants are nationally representative in terms of age, gender, region, ethnicity and political affiliation. Only participants who quit the study before reaching the end and those who failed the attention checks were excluded.

According to a power analysis for a 3-predictor multiple regression with a partial  $f^2$  of .02 (a canonically small effect size) and an alpha of .01 (the alpha value used in the original study), we needed 1140 participants for .95 power. Therefore, our target sample size was 1300—nearly 2.5 times larger than the original research (Brandt et al., 2014). This specific power analysis was based on a linear multiple regression with belief superiority as the predicted variable and the predictors being the attitude as a linear term, attitude as a quadratic term and dogmatism.

We also ran a power analysis for equivalence testing (specifically, regression-based TOST; two one-sided t tests) using the TOSTER R package function ‘powerTOSTone’ in which we would be able to reject the presence of effects of  $d > 0.1$ . According to this power analysis, with an alpha of .05 and the proposed sample size of 1140, we would have .92 power. Thus, our target sample size would be sufficient for equivalence tests.

## Materials

We used the same materials as in the original study, which the authors placed online in supplementary materials. These materials included a measure of dogmatism (Altemeyer’s 2002 Dogmatism scale;  $\alpha = .85$ ,  $M = 4.40$ ,  $SD = 1.10$ ), belief superiority (a 5-pt Likert scale from 1 = “no more correct than other viewpoints” to 5 = “totally correct, mine is the only correct view”;  $\alpha = .90$ ,  $M = 2.58$ ,  $SD = 1.05$ ) and issue relevant attitudes ( $\alpha = 0.58$ ,  $M = 2.66$ ,  $SD = 0.60$ ). These scales included topics such as “when is it acceptable to torture?”, and response options on 4- or 5- point Likert scales (e.g., 1 = *never*, 2 = *only in extreme circumstances to prevent an impending terrorist act*, 3 = *whenever it might yield useful information*, 4 = *all terrorists should be tortured*).

We ran a separate pilot study prior to the replication to select appropriate attitude scales. We asked participants whether they considered 20 topics to be controversial issues (1 = *not at all*

*controversial* to 7 = *extremely controversial*). We included the nine topics from the original study as well as 11 new topics (LGBT rights, Planned Parenthood funding, gender identity, death penalty, confederate flag, euthanasia, safe spaces, cost of education, military spending, climate change and gun control). Scales with a mean controversy score above 4 (the midpoint of the scale) for both Democratic and Republican participants were interpreted as controversial and included in the study. Additionally, we presented participants with the scale points for all the attitude scales (e.g., the torture attitude scale) and asked them to arrange them from extremely conservative to extremely liberal to confirm the validity of the scales.

We also included new items to assess political affiliation (self-identify as a Democrat, Republican, Independent or Other) and political orientation (from 1 = *extremely conservative* to 7 = *extremely liberal*; Jost, 2006;  $M = 3.98$ ,  $SD = 1.66$ ). We also included one-item measures of social ( $M = 4.12$ ,  $SD = 1.70$ ) and economic conservatism ( $M = 3.87$ ,  $SD = 1.69$ ), in order to tease the two forms of conservatism apart in our analyses. These items were: In terms of [“social and cultural issues” or “economic issues”], how liberal or conservative are you? (from 1 = *extremely conservative* to 7 = *extremely liberal*).

Therefore, we included three operationalizations of political orientation: 1. *Inferred political orientation* (i.e., political orientation inferred from the liberal/conservative lean of their average attitude score), 2. *Self-reported political orientation* (i.e., measured with a Likert scale from conservative to liberal) and 3. *Political affiliation* (i.e., self-identification as a Democrat, Republican, Independent or Other).

## **Procedure**

We used a procedure nearly identical to that of Toner and colleagues (2013). The methods and analysis plan were pre-registered on AsPredicted (<https://aspredicted.org/fr299.pdf>)

prior to conducting any analyses. We also placed all materials, analysis scripts and de-identified raw data on OSF (<https://osf.io/x79pm/>) and the preregistration on AsPredicted (<https://aspredicted.org/fr299.pdf>). As per the original study, participants were asked to fill out a questionnaire about 8 controversial political issues determined by the pilot results. For each issue, participants stated their position on the corresponding 4 or 5-pt scale and their perceived belief superiority for that issue. We randomized the order of scales. Participants then completed the dogmatism measure, the demographics survey (e.g., age, gender, education level), to what extent they followed politics, their political affiliation, their political orientation, and their social and economic conservatism<sup>1</sup>.

## **Analysis Plan**

### **Dogmatism**

We used a similar analysis plan to the original study. We first analyzed whether there was a linear or quadratic relationship between “inferred political orientation” and dogmatism to see whether those with more liberal or conservative political attitudes score higher on dogmatism. We ran a multiple regression in which dogmatism was regressed onto a linear term and a quadratic term for inferred political orientation. We ran the same analysis with self-reported political orientation and a simple t-test comparing the average dogmatism scores of self-identified Democrats and Republicans. We planned to use equivalence testing for the regression predictors that were non-significant.

We expected to successfully replicate the original study in three ways. (1) The inferred political orientation linear term would be a significant predictor of dogmatism, such that those

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<sup>1</sup> Including these additional items (i.e., political affiliation, political orientation, and conservatism items) after the primary dependent measures is one deviation from the original study.



with more conservative attitudes would show higher dogmatism than those with more liberal attitudes, and the quadratic term would be smaller than our smallest effect size of interest. (2)

The political orientation linear term would be a significant predictor, such that those with stronger conservative ideology would show higher dogmatism than those with stronger liberal ideology, and the quadratic term would be smaller than our smallest effect size of interest. (3)

Republicans would report higher dogmatism than Democrats. The first test evaluated replicability (as this was the original measure used), and the second and third tests evaluated generalizability.

If we replicated the finding that conservatives had higher dogmatism than liberals, we planned a final exploratory analysis. We would regress dogmatism onto the participants' economic conservatism score and social conservatism score to examine which aspect of conservative ideology, or both, was correlated with dogmatism.

### **Belief Superiority**

For belief superiority, we planned to run an analysis similar to the original study, regressing belief superiority onto linear and quadratic effects for political attitudes. We would run regressions both with and without including dogmatism as a covariate. Unlike the original study, in which the authors ran a separate regression for each issue, we planned to run one multilevel regression that included issue topic as a random variable and participant as a random variable to evaluate the generalizability to controversial political issues more broadly (not merely the specific topics we used; Judd, Westfall & Kenny, 2012; see also Cohen, Cohen, West & Aiken, 2013). We planned equivalence testing for non-significant regression predictors. We predicted a successful replication such that both extreme liberal and extreme conservative

attitudes would be associated with higher perceived belief superiority. We predicted that the linear term would be smaller than the smallest effect size of interest.

## **Results**

### **Pilot**

#### **Controversiality**

We found that the overall mean score of controversiality for all 20 scales was above 4 (the midpoint of the scale). Looking at Democratic participants only, all mean scores were above 4. Similarly, when looking at only Republican participants, all mean scores were above 4. Looking at just Independent participants, all mean scores were above 4 except for the scales for government helping those in need and Muslim religious rights. Therefore, these two scales were not included in the replication study (as per our pre-registered exclusion criteria).

#### **Scale Point Ordering**

We also included scales for which at least 50% of the participants placed the scale points in their original order. These scales were: 1) Immigration, 2) Abortion, 3) Voting identification, 4) Tax, 5) Torturing terrorists, 6) Affirmative action, 7) Military spending, and 8) The US government's handling of COVID-19. Of the original 20 scales included in the pilot, these were the 8 scales that met our criteria and were therefore included in the study.

### **Main Study**

#### **Participants**

We collected 1319 American participants on Lucid. As pre-registered, we removed participants who did not finish the study ( $N = 0$ ) and those who failed either of the two attention checks ( $N = 612$ ). We compensated participants \$1 for their participation. Due to the large number of participants who failed the attention checks (a limitation to our study as it reduces the

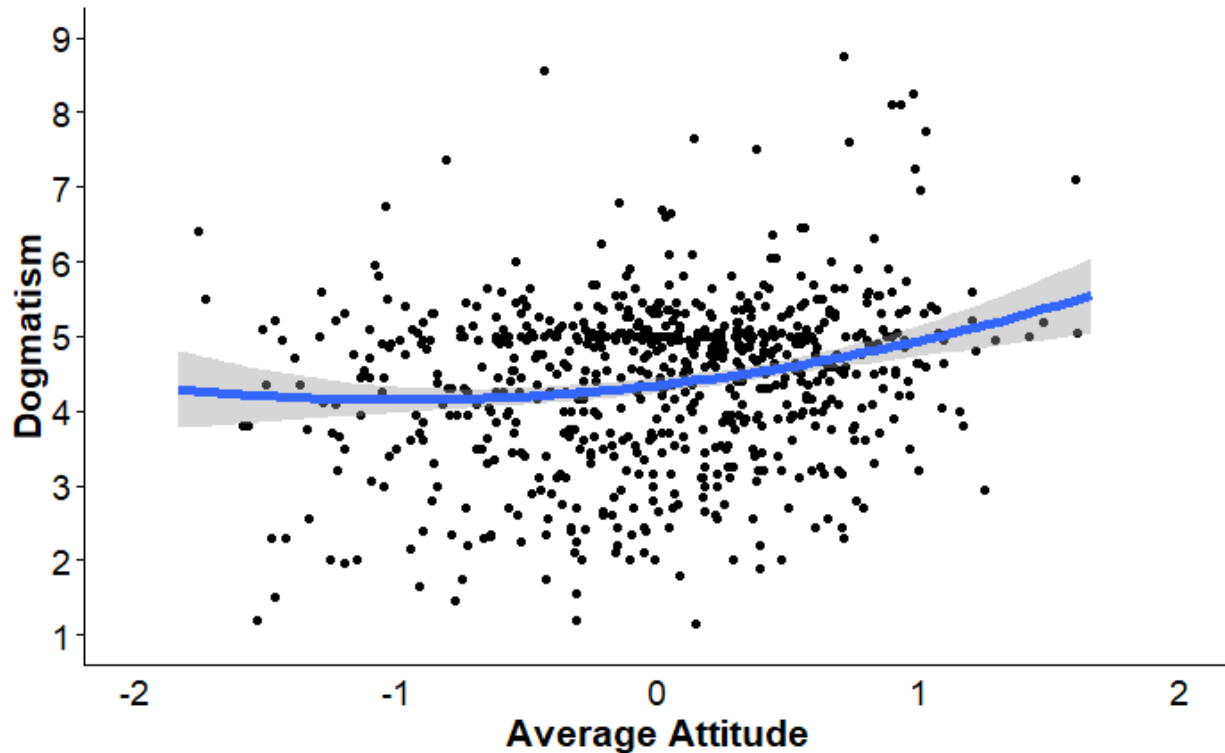
quality of the data), we decided *post hoc* to run all analyses both with the smaller sample (N = 707) as well as with the total sample (N = 1319) to ensure our results were robust. In our reduced sample, 41% of participants self-categorized as Democrats and 32% as Republicans<sup>2</sup>, with a mean age of 44.89 ( $SD = 16.24$ ) and 55% of them identified as female. Here, we report the results from the smaller preregistered sample; the conclusions from the larger sample results were virtually identical (with the exception of the exploratory dogmatism analysis) and can be found on the OSF page. This study was run on May 6<sup>th</sup>, 2020.

### **Dogmatism**

We sought to directly and conceptually replicate Toner et al.'s (2013) dogmatism finding. They found that the linear term, but not quadratic term, of inferred political orientation significantly predicted individuals' dogmatism scores. First, we found that both the linear ( $\beta = -0.39, t(703) = -5.68, p < .001$ ) and the quadratic ( $\beta = 0.20, t(703) = 2.31, p = .021$ ) mean-centered inferred political orientation terms predicted dogmatism (see Figure 1). This replicated the original work and revealed an additional curvilinear effect.

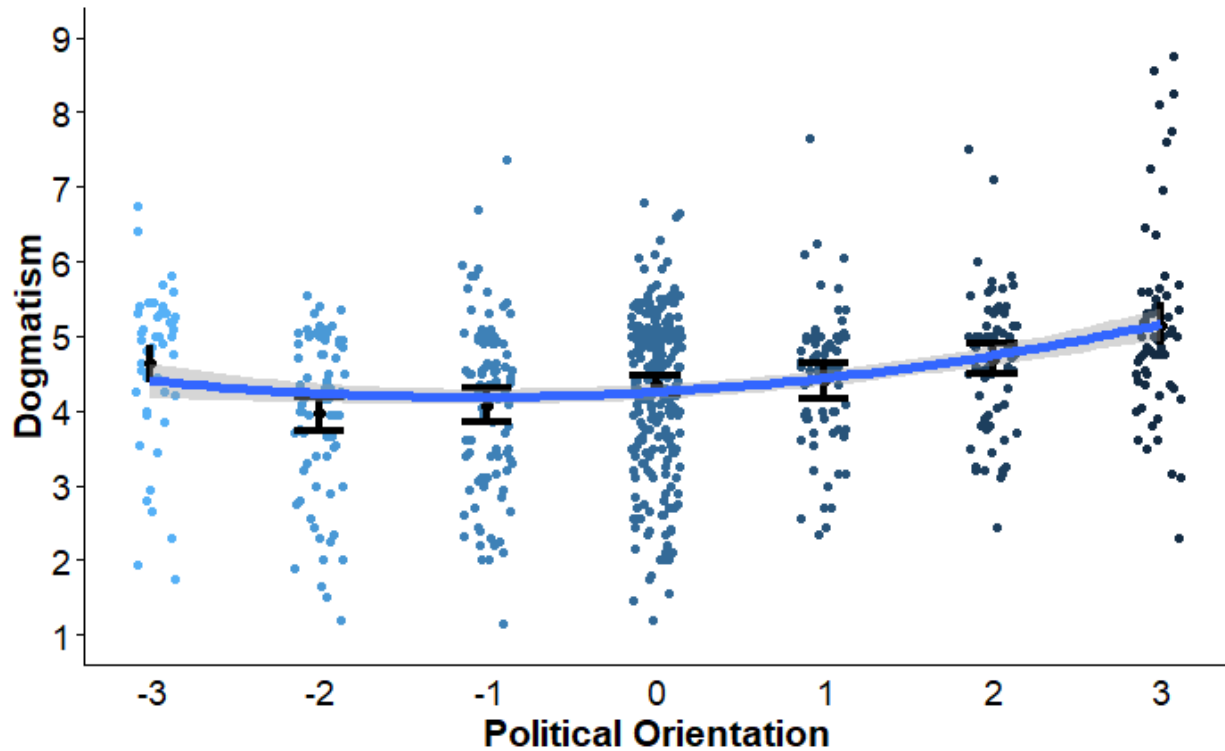
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<sup>2</sup> According to a recent Gallup poll (Gallup, 2020), 30% of respondents reported being a Republican and 31% reported being a Democrat. In our reduced sample, we have approximately the predicted proportion of Republicans (31.8%), although Democrats were somewhat oversampled (41.2%).



*Figure 1.* A scatterplot of the relation between dogmatism scores (averaged across the 20-item measure; y-axis) and mean-centered inferred political orientation (averaged across the 8 attitude scales and then mean-centered; x-axis). The dogmatism scale runs from low (1) to high (9) dogmatism. The inferred political orientation scale rules from very liberal (low scores) to very conservative (high scores). On the scatterplot, we have plotted the quadratic regression line and the 95% confidence interval on the fitted values. We found that more conservative inferred political orientation scores were associated with higher dogmatism (linear effect) but also that individuals at both extremes (conservative and liberal) had higher dogmatism scores (quadratic effect).

Second, we regressed the mean dogmatism scores onto the linear and quadratic terms for mean-centered political orientation. We again found that both the linear ( $\beta = -0.13$ ,  $t(702) = -5.21$ ,  $p < .001$ ) and the quadratic ( $\beta = 0.06$ ,  $t(702) = 4.84$ ,  $p < .001$ ) political orientation terms predicted dogmatism (see Figure 2). This conceptually replicated the linear effect in the original work and revealed an additional curvilinear effect.



*Figure 2.* A scatterplot of the relation between dogmatism scores (averaged across the 20-item measure; y-axis) and mean-centered political orientation scores (x-axis). The dogmatism scale runs from low (1) to high (9) dogmatism. The political orientation scale runs from very liberal (low scores) to very conservative (high scores). On the scatterplot, we have plotted the quadratic regression line and the 95% confidence interval on the fitted values. We found that more conservative political orientation scores were associated with higher dogmatism (linear effect) but also that individuals at both extremes (conservative and liberal) had higher dogmatism scores (quadratic effect).

Third, we ran a simple t-test comparing the mean dogmatism scores between Democrats and Republicans. The dogmatism scores of Republicans were higher than Democrats ( $t(468.74) = -4.81, p < .001$ ).

Finally, we ran a pre-registered exploratory analysis in which we regressed mean dogmatism scores onto self-reported social and economic conservatism scores. We found that both social conservatism ( $\beta = -0.21, t(703) = -5.40, p < .001$ ) and economic conservatism ( $\beta = 0.08, t(703) = 2.09, p = .037$ ) were significant predictors of dogmatism. However, when we ran

this analysis with the total sample, only social conservatism ( $\beta = -0.14$ ,  $t(1309) = -5.20$ ,  $p < .001$ ), and not economic conservatism ( $\beta = 0.01$ ,  $t(1309) = 0.29$ ,  $p = .77$ ), was a significant predictor.

### **Belief Superiority**

We regressed belief superiority onto the linear and quadratic terms for attitude. Unlike in the original study, we ran one multilevel model in which we included a random intercept for subject and a random intercept for topic, the latter of which contained linear and quadratic attitude terms. (We also ran the models without including the quadratic attitude term for attitude topic, due to the boundary being singular when included, and the conclusion of the results was the same; see supplement.) We ran this model with and without including dogmatism as a covariate. When we included dogmatism, we found that the quadratic term ( $\beta = 0.17$ ,  $t(54.02) = 18.69$ ,  $p < .001$ ) and dogmatism ( $\beta = 0.41$ ,  $t(704.91) = 13.51$ ,  $p < .001$ ), but not the linear term ( $\beta = -0.02$ ,  $t(6.86) = -0.27$ ,  $p = .794$ ), predicted belief superiority. When we did not include dogmatism, we again found that the quadratic term ( $\beta = 0.17$ ,  $t(9.50) = 18.29$ ,  $p < .001$ ), but not the linear term ( $\beta = -0.03$ ,  $t(6.85) = -0.37$ ,  $p = .724$ ), predicted belief superiority (see Figure 3).

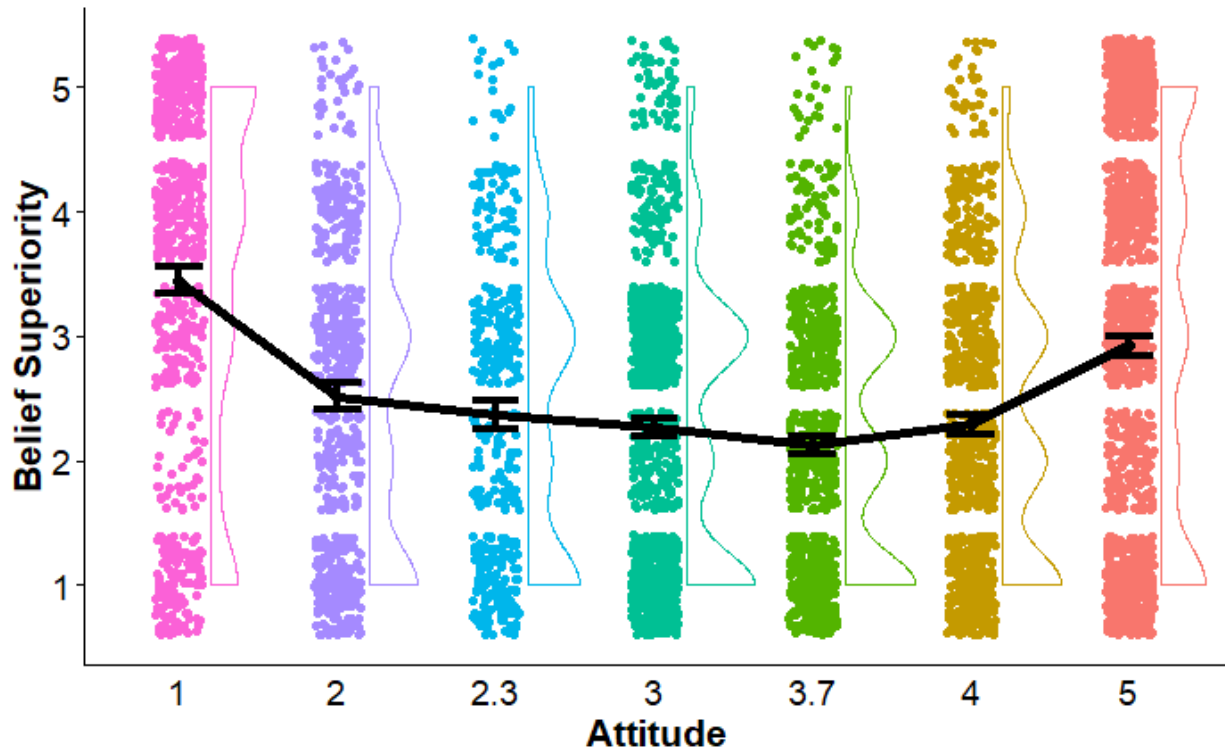


Figure 3. A scatterplot of the relation between belief superiority ratings (per subject and per topic; y-axis) and their associated attitude rating (x-axis). The belief superiority scores run from low (1) to high (5) belief superiority. The attitude scores run from very liberal (1) to very conservative (5). The x-axis points of 2.3 and 3.7 are a result of converting the 4-point attitude scales into a 5-point scale. Next to the raw data is a raincloud plot of the frequency of belief superiority scores for each attitude value. On top of the scatterplot, we have plotted the mean belief superiority score for each attitude value, as well as their 95% confidence intervals. We found that extreme attitude ratings (both conservative and liberal) were associated with higher reported belief superiority (quadratic effect).

We used equivalence testing to test whether the non-significant linear terms were smaller than the smallest effect size of interest. For the model including dogmatism, the equivalence test was significant,  $t(705) = 2.39, p = .0087$ , given equivalence bounds of -0.1 and 0.1 and an alpha of 0.05. The null hypothesis test was non-significant,  $t(705) = -0.27, p = .786$ , given an alpha of 0.05. Similarly, for the model that did not include dogmatism, the equivalence test was significant,  $t(706) = 2.29, p = .011$ , given equivalence bounds of -0.1 and 0.1 and an alpha of 0.05. The null hypothesis test was non-significant,  $t(706) = -0.37, p = .713$ , given an alpha of 0.05.

0.05. Based on the equivalence test and the null-hypothesis test combined, the observed linear effect is statistically not different from zero and statistically different from values outside of our smallest effect size of interest.

Finally, average belief superiority scores were positively correlated with dogmatism scores ( $r(704) = .44, p < .001, 95\% \text{ CI } [0.37, 0.49]$ ), suggesting that these constructs are related but distinct.

### **Discussion**

Prior research found that those with more conservative attitudes had higher dogmatism scores than those with more liberal attitudes and that people with more extreme political attitudes reported higher belief superiority (Toner, Leary, Asher & Jongman-Sereno, 2013). We successfully replicated this relationship between dogmatism and political orientation. We also conceptual replicated this pattern using new measures of political orientation and political identity. We replicated the finding that individuals with more extreme attitudes, both liberal and conservative attitudes, reported higher belief superiority. Therefore, these patterns appear to be robust across samples, time, and measures.

Our research also revealed an important difference from prior work. Specifically, we found that people with more extreme conservative *or* liberal ideologies both had higher dogmatism scores. It is hard to know if this new finding stemmed from our larger sample or differences in the socio-political context that have changed over the past decade (see Van Bavel et al., 2016). For instance, this new result may be due to the increasing polarization amongst partisans (*both* Republicans and Democrats; Pew Research Center, 2014). It seems plausible, if not likely, that polarization could help produce greater dogmatism across the political spectrum.



It is also possible that presence of higher dogmatism in liberals may be related to the COVID-19 pandemic. In addition to the broader temporal trend of increasing polarization, liberals' certainty that the Republican government is mishandling the COVID-19 crisis could be related to an increase in general dogmatism. Indeed, for the COVID-19 related attitude scale, more liberal attitudes were associated with higher belief superiority compared to more conservative attitudes (in addition to the quadratic relationship; Federico & Malka, 2018).

The results speak to the political symmetry versus asymmetry debate in political psychology (Ditto et al., 2019; Baron & Jost, 2019). Rather than resolve this debate, our findings complicate the matter. We found clear and robust evidence for both symmetry (belief superiority and, to some extent, dogmatism) and asymmetry (dogmatism) within the same sample of participants. We also found that the relationship between belief superiority and attitudes for each were highly variable. For two of the topics (immigration and voting identification) more conservative attitudes were associated with higher belief superiority, whereas for the COVID-19 topic, more liberal attitudes were associated with higher belief superiority (military spending was trending in this direction as well; see supplement for topic specific model results). We selected our topics based on those perceived as controversial, but future research should examine either a random sample of political topics or else completely apolitical topics to help resolve this debate. Until then, the symmetry versus asymmetry debate, at least in the domain of belief superiority, may represent a false dichotomy and instead rely on the topic under investigation.

## **Conclusion**

The current work provides further evidence that conservatives have higher dogmatism scores than liberals while both conservative and liberal extreme attitudes are associated with higher belief superiority (and dogmatism). However, ideological differences in belief superiority

vary by topic. Therefore, to assess general differences between liberals and conservatives it is necessary to look across many diverse topics and model the data appropriately. If scholars instead choose to study one topic at a time, any ideological differences they find may say more about the topic than about differences between liberals and conservatives.

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