Article

The Political Domain Appears Simpler to the Politically Extreme Than to Political Moderates

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Abstract

How does political preference affect categorization in the political domain? Eight studies demonstrate that people on both ends of the political spectrum—strong Republicans *and* strong Democrats—form simpler and more clustered categories of political stimuli than do moderates and neutrals. This pattern was obtained regardless of whether stimuli were politicians (Study 1), social groups (Study 2), or newspapers (Study 3). Furthermore, both strong Republicans and strong Democrats were more likely to make inferences about the world based on their clustered categorization. This was found for estimating the likelihood that geographical location determines voting (Study 4), that political preference determines personal taste (Study 5), and that social relationships determine political preference (Study 6). The effect is amplified if political ideology is salient (Study 7) and remains after controlling for differences in political sophistication (Study 8). The political domain appears simpler to the politically extreme than to political moderates.

Keywords

America is more politically polarized today than it has been for generations (Haidt, 2012; Layman & Carsey, 2002). Partisanship has increased not only among politicians but also among the electorate (Brewer, 2005; McCarty, Poole, & Rosenthal, 2006). Increasing political divisions have important psychological consequences. For example, people at the political extremes are more intolerant and more inclined to believe their attitudes to be superior than are moderates (Brandt, Reyna, Chambers, Crawford, & Wetherell, 2014; Toner, Leary, Asher, & Jongman-Sereno, 2013). People with a strong political preference also perceive the nation to be more polarized than do people with a more moderate political opinion (Van Boven, Judd, & Sherman, 2012; Westfall, Van Boven, Chambers, & Judd, 2015). But in the current work, we aim to show that a strong political preference may have even more fundamental effects: Political extremity can shape the way people categorize the political domain. We aim to show that those at the political extremes categorize political reality more strongly, forming more tightly defined, homogeneous, and clustered categories, compared to moderates, who see more shades of gray.

Political Preference and Representation of Political Stimuli

This idea derives from the notion that what people see and perceive is not solely a function of objective reality but rather results from an active cognitive process of representation (Bruner, 1957). People categorize the 52 unique elements of a deck of cards into four suits. By reducing the complexity of the deck to four clusters of cards with a similar color, people can more effectively use their limited mental capacities to win the game (Bruner & Postman, 1949). What is true for playing cards is true for reality in general. Categorization reduces reality to clusters and categories, which allows people to deal with the world more effectively by simplifying an abundance of stimuli (Allport, 1954; Fiske & Neuberg, 1990). When formulating our hypotheses on how political preference relates to categorization of the political domain, we noted two opposing hypotheses on that relation:

Rigidity of the Right

First, according to the *rigidity-of-the-right hypothesis*, strong conservatives tend to perceive reality in more rigid and sharply

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defined categories, whereas others, including strong liberals, engage in more nuanced thinking (Altemeyer, 1998; Frenkel-Brunswik, 1949). A wealth of research has supported this hypothesis, by demonstrating that conservatives are less tolerant of ambiguity and have higher needs for structure and order (Chirumbolo, 2002; Jost, Glaser, Kruglanski, & Sulloway, 2003; Jost et al., 2007; Kirton, 1978; Sidanius, 1978; Van Hiel, Pandelaere, & Duriez, 2004; Webster & Kruglanski, 1994). Given that people with a reduced tolerance for ambiguity and an increased need for structure tend to perceive more within-category similarity and between-category dissimilarity (Ames, 2004; Krueger & Rothbart, 1990; Moskowitz, 1993; Nosofsky, 1987; Tenenbaum & Griffiths, 2001), it can be hypothesized that conservatives form more rigid and sharply defined categories. This rigidity-of-the-right hypothesis therefore predicts an asymmetric effect: Strong conservatives will categorize more sharply than moderates—but strong liberals will not.

Ideological Extremity

In contrast, the *ideological extremity hypothesis* holds that people on both political extremes—strong conservatives *and* strong liberals—categorize the political domain more sharply. This idea follows from work that shows that the psychological processes underlying political extremism are largely the same on both sides of the political continuum (Brandt et al., 2014; Rokeach, 1956; Tetlock, 1984). Indeed, emerging findings show that extremists on both sides are more dogmatic and less complex (Conway et al., 2016) and are more likely to believe in overly simplistic conspiracy theories (Van Prooijen, Krouwel, & Pollet, 2015). One factor that may explain such effects is a more categorical and sharply defined mental representation of the political domain. After all, categorization helps people not only to simplify the environment but also to structure the environment according to dimensions that are personally relevant for them (Nosofsky, 1987; Nosofsky, Clark, & Shin, 1989; Tajfel & Wilkes, 1963). Just as people with an extreme position on the issue of race—racists—spontaneously use racial dimensions more in structuring stimuli, producing homogeneous categories of Whites and Blacks (Pattyn, Rosseel, & Van Hiel, 2012; Stangor, Lynch, Duan, & Glas, 1992), people with an extreme political position can be expected to spontaneously use the political–ideological dimension. This ideological rigidity hypothesis therefore predicts a symmetric effect: Strong conservatives and strong liberals will categorize political stimuli more sharply, compared to neutrals and moderates.

Current Approach

In summary, two hypotheses make different predictions regarding how people's political preference relates to their categorization of political stimuli. The current work tests these hypotheses against each other. We propose that one important reason why literature supports two different predictions is that the dominant approach for testing the relation between ideology and cognition has been to measure participants' agreement or disagreement with series of statements. One methodological problem of this approach is that it assumes that researchers can correctly identify those items that, in measuring participants' agreement versus disagreement with them, best capture the variable of interest (Brunswik, 1955; Fiedler, 2011). Emerging findings show that those assumptions are problematic. Small changes to the selection of dependent measures can lead to radically different conclusions about the relation between political preference and cognition (Brandt et al., 2014; Conway et al., 2016).

We therefore use objective stimuli selection methods. For example, in Study 1, where we focus on the categorization of politicians, we use the most commonly known U.S. politicians as stimuli based on pilot testing. Furthermore, to avoid restraining participants' responses to mere agreement or disagreement, in the first three studies, we use a two-dimensional sorting paradigm that measures categorization without any top-down assumptions (Hout, Goldinger, & Ferguson, 2013; Koch, Alves, Krüger, & Unkelbach, 2016; Koch, Imhoff, Dotsch, Unkelbach, & Alves, 2016; Unkelbach, Fiedler, Bayer, Stegmüller, & Danner, 2008). In the latter five studies, we measure categorization by testing perceptions of probabilities, which only requires the assumption that people's probabilistic inferences depend on their mental representation of reality (Anderson, 1991; Fiedler, 1996; Tversky, 1977; Tversky & Gati, 1982).

Political Sophistication and Knowledge

One important possible alternative explanation of the here-hypothesized effect is that those on the extremes of the political continuum are sometimes found to have greater political knowledge and sophistication (Delli Carpini & Keeter, 1996; Federico & Hunt, 2013; Palfrey & Poole, 1987; Sidanius, 1984, 1988; Sidanius & Lau, 1989; Van Hiel & Mervielde, 2003; Zaller, 1992). Therefore, any effect of extremity on categorization may be due to their greater ability to correctly sort stimuli according to ideology. Therefore, we use a variety of different approaches to rule out this alternative explanation throughout these studies. We briefly discuss them in each study and return to this issue in the General Discussion section.

Summary

We tested how differences in political ideology relate to differences in the categorization of political stimuli, using eight studies, in which we use two approaches: a sorting paradigm (Studies 1–3) and a measurement of probabilistic inferences (Studies 4–8). Throughout these studies, we measured political ideology on a scale between strongly Democrat (1) and strongly Republican (5), with neutral (3), moderate Democrat (2), and moderate Republican (4) in the middle. The rigidity-of-the-right hypothesis predicts a positive linear effect of political preference on categorization strength, such that as people move from strongly Democrat to strongly Republican, they represent political stimuli more sharply along political lines,

forming denser, and more homogeneous clusters; conversely, the ideological extremity hypothesis predicts a U-shaped quadratic effect, such that people on both ends of the political extremes categorize more strongly compared to moderates.

In the main text, we only discuss essentials of the study. Each study is discussed in detail in the Supplemental Online Materials (SOM), including discussion on sample size. We did not exclude any data, we report all measures, and we include a meta-analysis to avoid any file drawer effect.

Study 1—Politicians in the Arena

Participants were asked to spatially arrange the names of politicians, placing similar politicians closer together and dissimilar politicians wider apart. Simpler categorization occurs as participants place exemplars of the same category together in dense clusters and further away from exemplars of a different category.

Method

Participants and Design

Participants were 114 American Amazon Mechanical Turk (MTurk) users (42 women, 72 men; $M_{age} = 36.1$ years) who participated for US$1.

Procedure and Measures

Participants were presented with the names of 10 U.S. American Democrat politicians (e.g., Bill Clinton) and 10 Republican (Sarah Palin) politicians. A pilot test confirmed that most participants (78%) could correctly identify all or all but one of the politicians correctly ($M = 18.74, SD = 2.28$). This is important to rule out that effects are driven by differences in political sophistication.

Participants were instructed to sort politicians' names "according to your own feeling of how similar or dissimilar these people are" by dragging and dropping similar politicians closer together and dissimilar politicians wider apart on the screen. Participants were free to change the position of any stimulus at any time. After completing the spatial sorting task, participants indicated their political preference.

Results

We operationalized sharpness of categorization by dividing the average intraclass difference (e.g., Obama–Pelosi) by the average interclass difference (e.g., Obama–Palin) and subtracted this from 1 (Hout et al., 2013; Unkelbach et al., 2008). This index approaches 1 if participants fully follow categories in their sorting and approaches 0 if they abandon categories completely. Next, in this and all subsequent studies, we used hierarchical polynomial regression analysis to test the effect of political preference on sharpness of categorization.

Contrary to the rigidity-of-the-right hypothesis, we found no significant linear effect on categorization, $B = -0.01$,

$SE = 0.02$, 95% confidence interval [CI] [−0.05; +0.04], $\beta = -0.03, F(1, 111) = 0.10, p = .76, R^2 = .001$, but, consistent with the ideological extremity hypothesis, a positive U-shaped quadratic effect emerged, $B = 0.09, SE = 0.02$, 95% CI [+0.05; +0.13], $\beta = 0.46, \Delta F(1, 111) = 21.79, p < .0001$, $\Delta R^2 = .16$. Both strong Democrats ($M = 0.64, SD = 0.17$) and strong Republicans ($M = 0.61, SD = 0.16$) formed more homogeneous and clustered categories than neutrals ($M = 0.31, SD = 0.24$), moderate Democrats ($M = 0.48, SD = 0.21$), or moderate Republicans ($M = 0.56, SD = 0.21$). Figure 1 shows averaged results across the first six studies. Figure 2 presents how strong Democrats/strong Republicans (Figure 2A) and how neutrals (Figure 2B) sorted the stimuli on average. Note that those on the extremes formed denser clusters that are wider apart, compared to neutrals.

Study 2—Social Groups in Society

To generalize our findings, Study 2 focused on categorization of social groups in society, stereotypically associated as either liberal or conservative.

Method

Participants and Design

Participants were 202 American MTurk users (91 women, 111 men; $M_{age} = 32.3$ years) who participated for US$1.

Procedure and Measures

The procedure was highly similar to that of Study 1. Participants were asked to spatially arrange the names of six stereotypically liberal (e.g., feminists) and six conservative (e.g., businesspeople) social groups. This selection follows Chambers, Schlenker, and Collisson (2013) who found that these groups' political stereotypes are commonly known, which is important to rule out that effects are driven by differences in political sophistication. Participants were instructed to follow their own feelings about the groups' (dis)similarity.

Results

As in Study 1, we found no significant linear effect of political preference on categorization, $B = 0.01, SE = 0.01$, 95% CI [−0.02; +0.03], $\beta = 0.05, F(1, 200) = 0.47, p = .50$, $R^2 = .002$, but instead a significant quadratic effect, $B = 0.03, SE = 0.01$, 95% CI [+0.004; +0.05], $\beta = 0.16$, $\Delta F(1, 199) = 5.22, p = .02, \Delta R^2 = .03$ (see Figure 1). Both strong Democrats ($M = 0.26, SD = 0.17$) and strong Republicans ($M = 0.31, SD = 0.21$) categorized social groups more strongly according to their political ideology than neutrals ($M = 0.21, SD = 0.20$), moderate Democrats ($M = 0.21, SD = 0.19$), and moderate Republicans ($M = 0.23, SD = 0.14$). Figure 3 presents how strong Democrats/strong Republicans (Figure 3A) and how neutrals (Figure 3B) sorted stimuli on average.
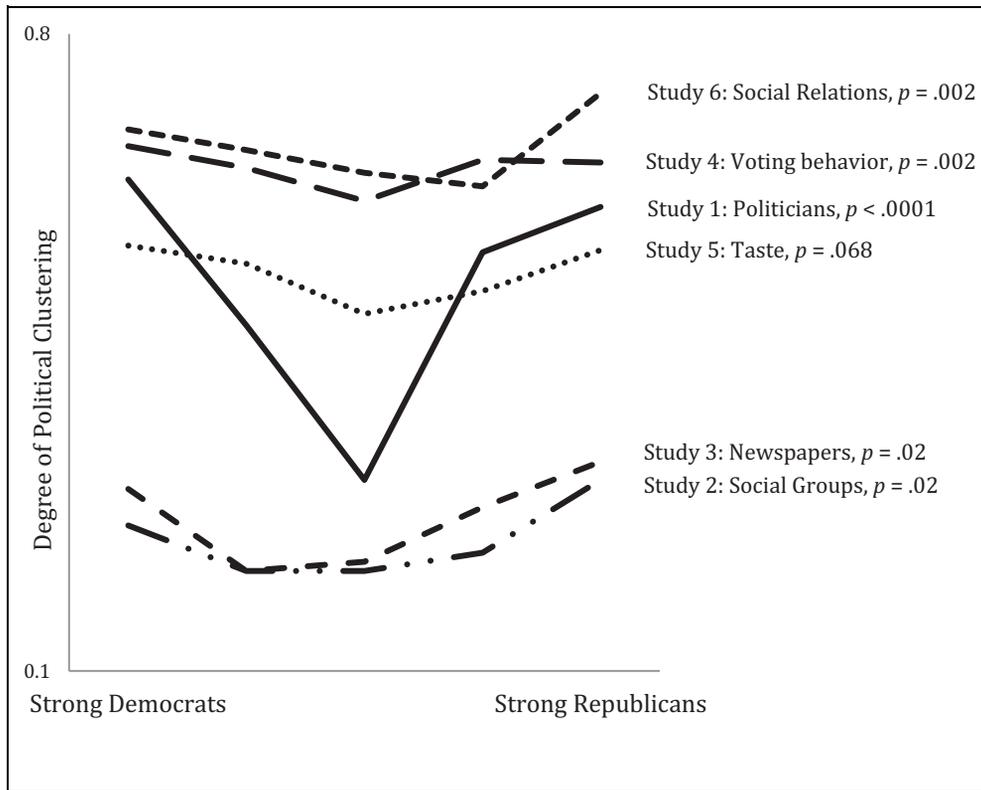
Figure 1. Results of Studies 1–6: Strength of categorization among strong Democrats, moderates, neutrals, and strong Republicans. Higher scores indicate a politically more homogeneous mental representation (Studies 1–3) and stronger inferences drawn from these representations (Studies 4–6). All dependent measures were rescaled from 0 to 1. For example, scores on a 7-point scale were rescaled, so that 1 and 7 are represented as 0 and 1, respectively. *p* Values test the quadratic parameter.
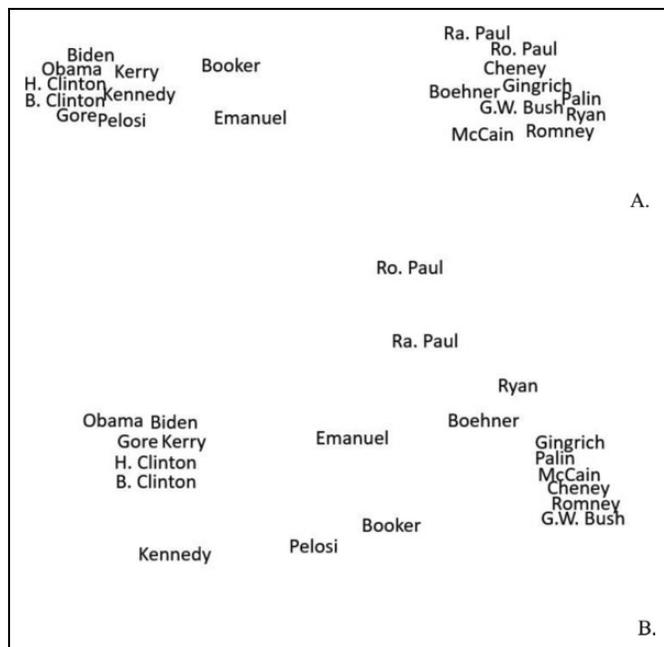

Figure 2. Study 1: 2-D scaling of the average similarity proximities of US politicians for strong Republicans/strong Democrats (A) and for neutrals (B). Moderate Republicans/ moderate Democrats scored in the middle (not shown).

Study 3—Newspapers

In Study 3, we focus on how people represent stimuli related to the media. To help rule out the effect of political sophistication, we computed degree of clustering using participants' subjective, rather than objective, classification, thus bypassing any effects of differences in political sophistication—allowing us to further rule out that concern.

Method

Participants and Design

Participants were 300 American MTurk users (131 women, 169 men; M_{age}= 34.2 years) who participated for US$1.

Procedure and Measures

Participants spatially ordered the names of 10 liberal (e.g., *New York Times*) and 10 conservative newspapers (e.g., *Wall Street Journal*; Gentzkow & Shapiro, 2010), following their own feelings about their (dis)similarity. Afterward, participants indicated for each newspaper whether they thought it is liberal or conservative. Participants were largely unable to accurately classify the correct political background of most newspapers and incorrectly classified five newspapers on average
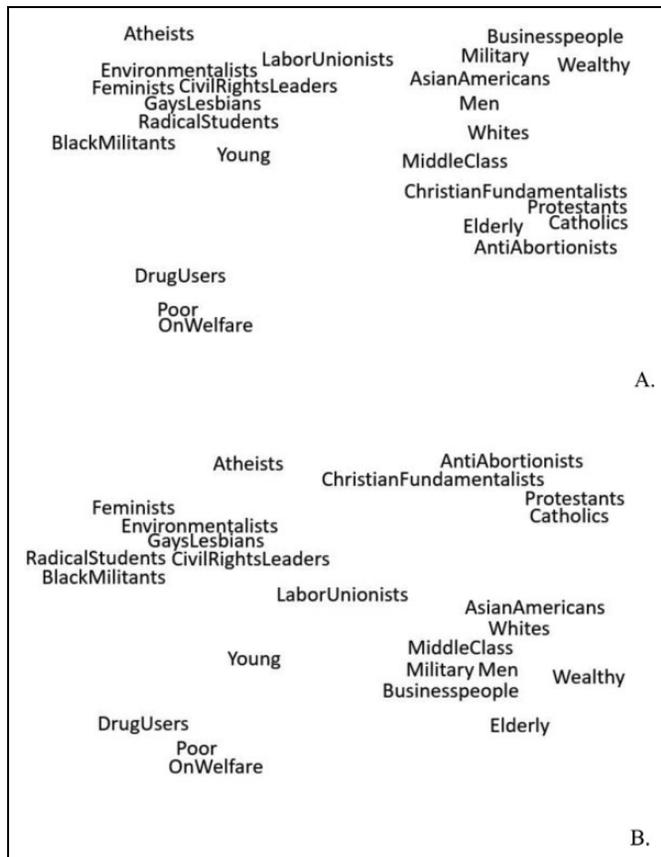
Figure 3. Study 2: 2-D scaling of the average similarity proximities of social groups for strong Republicans/strong Democrats (A) and for neutrals (B). Moderate Republicans/moderate Democrats scored in the middle (not shown).

($M = 15.00$, $SD = 3.03$). We instead computed the categorization score using an ideographic classification score based on participants' subjective classification of each stimulus, rather than objective classification, as in previous studies.

Results

As in prior studies, we found no linear effect of political preference on categorization, $B = 0.02$, $SE = 0.01$, 95% CI [−0.01; +0.05], $\beta = 0.08$, $F(1, 298) = 1.87$, $p = .17$, $\Delta R^2 = .006$, but a significant U-shaped quadratic effect, $B = 0.04$, $SE = 0.02$, 95% CI [+0.01; +0.07], $\beta = 0.14$, $\Delta F(1, 297) = 5.53$, $p = .025$, $\Delta R^2 = .02$. See Figure 1. Both strong Democrats ($M = 0.30$, $SD = 0.27$) and strong Republicans ($M = 0.33$, $SD = 0.28$) categorized newspapers more into two homogeneous and nonoverlapping clusters compared to neutrals ($M = 0.22$, $SD = 0.22$), moderate Democrats ($M = 0.21$, $SD = 0.23$), and moderate Republicans ($M = 0.28$, $SD = 0.28$).

Study 4—Elections Results

Whereas the first studies examined categorization directly, the next studies focused on perceptions of probabilities. Study 4 examined people's perceptions of election results by asking them to guess the 2012 Presidential Election results of traditionally red and blue states. If people on the political extremes categorize more strongly, then they will perceive the United States as consisting of two sharply defined red and blue parts and will therefore overestimate the support for the winner in each state. As such, categorization can lead to distortion and exaggeration. This is important because it allows further disentangling of categorization (which reduces accuracy; Allport, 1954; Fiske & Neuberg, 1990) and sophistication (which increases accuracy).

Method

Participants and Design

Participants were 300 American MTurk users (102 women, 198 men; $M_{age} = 31.1$ years) who participated for a payment of US$0.30.

Procedure and Measures

Participants estimated the percentage of people who voted for Obama versus for Romney (between 0% and 100%) in the 2012 Presidential Elections in each of the 16 traditionally red (e.g., Utah) and blue (Hawaii) states. In reality, 63% of the votes in these states went to the local majority candidate on average. Sharpness of clustering was operationalized as participants' predicted likelihood that people voted for the majority candidate within that state (i.e., we used raw voting outcomes in the states that Obama won and 100 minus this response in the states that Romney won).

Results

As in prior studies, we found no linear effect of political preference, $B = -0.86$, $SE = 0.53$, 95% CI [−1.90; +0.17], $\beta = -0.09$, $F(1, 298) = 2.70$, $p = .10$, $R^2 = .01$, but found a quadratic effect, $B = 1.38$, $SE = 0.44$, 95% CI [+0.51; +2.25], $\beta = 0.18$, $\Delta F(1, 297) = 9.80$, $p = .002$, $\Delta R^2 = .02$ (see Figure 1). Both strong Democrats ($M = 68\%$, $SD = 9$) and strong Republicans ($M = 66\%$, $SD = 9$) were more influenced by red–blue categorizing in their probability estimates than neutrals ($M = 62\%$, $SD = 9$). Moderate Democrats ($M = 65\%$, $SD = 9$) and moderate Republicans ($M = 66\%$, $SD = 8$) scored in the middle, albeit closer to their extreme copartisans than in other studies.

Importantly, note that the average election voting likelihood estimates provided by neutrals were closest to the actual results of the 2012 elections, collapsed across states (63%), whereas those provided by strong Democrats and strong Republicans were least accurate. This argues against an explanation that people with a strong political preference categorize more strongly because of greater knowledge because that would have produced more accurate responses among the extremes.

Study 5—Personal Taste

In Study 5, we test how political opinion relates to beliefs about the likelihood that people from different political backgrounds share personal taste. Given that sorting on this task does not require much sophistication, this can further rule out the potential confounding effect of political knowledge.

Method

Participants and Design

Participants were 301 U.S. American MTurk users (107 women, 194 men; $M_{age} = 32.2$ years) who participated for US$0.25.

Procedure and Measures

Participants completed a series of 12 questions regarding the likelihood that people with opposite political preferences shared the same taste in comedians, movies, books, talk shows, newspapers, and actors between *very unlikely* (1), *undecided* (3), and *very likely* (5). Higher scores suggest stronger categorization.

Results

Different than in previous studies, we did find a linear effect of political preference, $B = -0.07$, $SE = 0.04$, 95% CI [-0.14; -0.001], $\beta = -0.11$, $F(1, 299) = 3.93$, $p = .05$, $R^2 = .01$, but its direction was opposite to the rigidity-of-the-right hypothesis prediction. More importantly, as in Studies 1–4, there was a U-shaped quadratic effect, $B = 0.05$, $SE = 0.03$, 95% CI [-0.00; $+0.11$], $\beta = 0.11$, $\Delta F(1, 298) = 3.36$, $p = .068$, $\Delta R^2 = .01$ (see Figure 1). Strong Democrats ($M = 3.27$, $SD = 0.58$) and strong Republicans ($M = 3.25$, $SD = 0.61$) were more influenced by categorizing in their estimations than neutrals ($M = 2.97$, $SD = 0.69$) and moderates ($M_{Dem} = 3.19$, $SD = 0.58$; $M_{Rep} = 3.07$, $SD = 0.54$).

Study 6—Social Relations

Study 6 examined similar political clustering at an even more intimate level of social relations by looking at family and friend relationship. As in Study 5, the fact that these results do not depend on political sophistication can help rule out that potential confound.

Method

Participants and Design

Participants were 300 American MTurk users (102 women, 198 men; mean age 33.3 years) who participated for US$0.25.

Procedures and Measures

Participants indicated the likelihood that people within the same social circle (siblings, spouses, and friends) have similar political opinions, between *very unlikely* (1) and *very likely* (5), with higher scores suggesting stronger categorization.

Results

As in previous studies, there was no significant linear effect, $B = -0.04$, $SE = 0.02$, 95% CI [-0.08; $+0.01$], $\beta = -0.09$, $F(1, 298) = 2.53$, $p = .11$, $R^2 = .008$, but a significant U-shaped quadratic effect, $B = 0.06$, $SE = 0.02$, 95% CI [$+0.02$; $+0.10$], $\beta = 0.18$, $\Delta F(1, 297) = 9.84$, $p = .002$, $\Delta R^2 = .03$. Strong Republicans ($M = 3.78$, $SD = 0.47$) and strong Democrats ($M = 3.94$, $SD = 0.41$) categorized more strongly than neutrals ($M = 3.59$, $SD = 0.45$) and moderates ($M_{Dem} = 3.69$, $SD = 0.34$; $M_{Rep} = 3.53$, $SD = 0.35$; see Figure 1).

Study 7—Salience of Political Preference

Across the past six studies, we observed that people with an extreme political opinion are more inclined to spontaneously use political ideology to categorize stimuli. Of course, the correlational nature of these findings prevents strong claims about causality. To provide some indication of causality, Study 7 test whether this pattern is amplified if people's existing political preference is made salient beforehand, making the use of ideology as a category to sort stimuli even likelier. Furthermore, given that salience should not affect political knowledge, this can further rule out its possible confounding effect.

Method

Participants and Design

Participants were 483 American Mturk users (190 women, 293 men; mean age 33.0 years) who participated for US$0.25. Participants were randomly allocated to the increased salience or control condition.

Procedures and Measures

Different than in previous studies, we measured political preference before administering the dependent measures. Next, participants in the increased salience condition were asked to describe what their political preference means for them, while control participants described what happened yesterday. Next, all participants completed the same items as in Study 6.

Results

We present here only the critical results; full results are in the SOM. In Step 1, we found no evidence for any linear effects of political preference or its interaction with condition, on categorization, $F(3, 478) = 1.87$, $p = .13$, $R^2 = .012$. But as predicted, when we added the quadratic components in Step 2, we found evidence for a quadratic effect on the sharpness of clustering, $\Delta F(2, 476) = 11.43$, $p < .001$, $\Delta R^2 = .05$. Specifically, we found a marginal quadratic effect of political preference, $B = 0.05$, $SE = 0.03$, 95% CI [-0.002; $+0.097$],
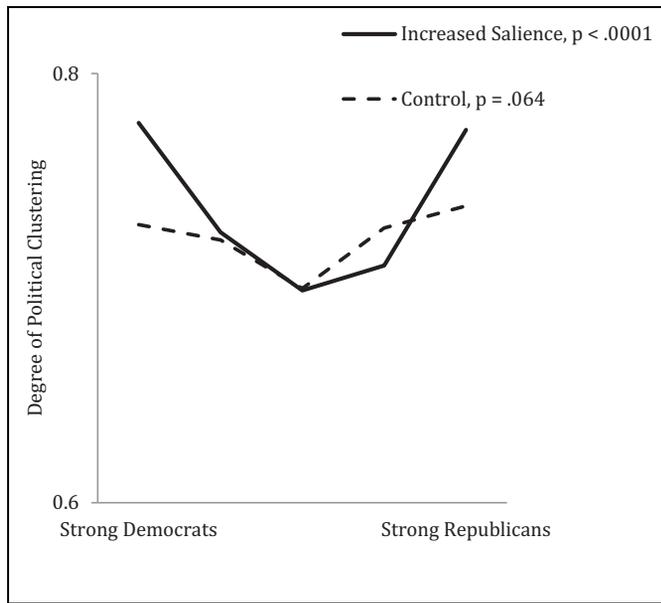
Figure 4. Results of Study 7: A strong political preference is associated with more strongly clustered categorizing, especially if that preference is salient (uninterrupted line), compared to when it is nonsalient (dashed line). Theoretical ranges from 0 to 1. *p* Values test the quadratic parameter.

$\beta = 0.12$, $t(476) = 1.89$, $p = .059$, qualified by an interaction with condition, $B = 0.07$, $SE = 0.04$, 95% CI [−0.005; +0.136], $\beta = 0.14$, $t(476) = 1.82$, $p = .069$. To interpret this interaction, we ran two separate polynomial regression analyses. In the control condition, we only found a modest U-shaped quadratic effect, $B = 0.05$, $SE = 0.03$, 95% CI [−0.003; +0.098], $\beta = 0.12$, $\Delta F(1, 238) = 3.47$, $p = .064$, $\Delta R^2 = .01$. This effect was dwarfed by the highly significant quadratic effect in the increased salience condition, $B = 0.11$, $SE = 0.03$, 95% CI [+0.063; +0.163], $\beta = 0.28$, $\Delta F(1, 238) = 19.90$, $p < .0001$, $\Delta R^2 = .08$ (see Figure 4).

Study 8—Controlling for Political Sophistication

Throughout the previous studies, we have used a wide variety of ways to minimize the effect of political sophistication. In Study 8, we directly measure differences in political sophistication to statistically control for them. We use the same design as in Study 6.

Method

Participants and Design

Participants were 302 American Mturk users (134 women, 168 men; mean age 33.0 years) who participated for US$0.50.

Procedures and Measures

Our design was identical to Study 6, except for adding a 25-item multiple-choice political knowledge measure, based on

Jordan (1999). All participants completed the same dependent measures as in Study 6 (see the SOM for details and results of the political knowledge measure).

Results

As in Study 6, there was a significant negative linear effect, $B = -0.06$, $SE = 0.02$, 95% CI [−0.10; −0.01], $\beta = -0.13$, $F(1, 300) = 5.46$, $p = .02$, $R^2 = .015$, opposite to the rigidity-of-the-right hypothesis and a significant U-shaped quadratic effect, $B = 0.08$, $SE = 0.02$, 95% CI [+0.03; +0.12], $\beta = 0.20$, $\Delta F(1, 299) = 12.31$, $p < .001$, $\Delta R^2 = .04$. The likelihood estimates of both strong Republicans ($M = 3.74$, $SD = 0.58$) and strong Democrats ($M = 3.82$, $SD = 0.41$) were more influenced by political categories than those of neutrals ($M = 3.52$, $SD = 0.43$) and moderates ($M_{Dem} = 3.65$, $SD = 0.39$; $M_{Rep} = 3.59$, $SD = 0.33$). Crucially, this U-shaped quadratic effect remained significant after controlling for sophistication, $B = 0.05$, $SE = 0.02$, 95% CI [+0.01; +0.09], $\beta = 0.14$, $p = .013$, even though there was a significant effect of sophistication, $B = 0.03$, $SE = 0.01$, 95% CI [+0.02; +0.04], $\beta = 0.29$, $p < .001$.

Meta-Analysis

To avoid a file drawer effect, we conducted a meta-analysis across all studies, including two studies that failed to show the expected effect (Cumming, 2014). Study 9 was similar to Study 2 but included more items. Here, the test of the quadratic effect showed a nonsignificant trend in the predicted direction, $p = .166$. Study 10 was similar to Studies 1 and 2 but used movie actors as stimuli. It failed to find any effect (quadratic trend, $p = .95$). Inspection of the patterns showed that participants instead clustered stimuli according to the type of movie (comedy, war, etc.). This shows a clear limit to the current effects—a readily available other dimension overwrites the effect. The SOM discusses both studies in detail. These are all the studies we conducted for this project. To provide a conservative test, we only included the control condition of Study 7.

We combined all data ($N = 2,573$, standardized within each study). A polynomial hierarchical regression showed a weak negative linear effect of political ideology on this combined variable, $B = -0.04$, $SE = 0.02$, 95% CI [−0.08; −0.00], $\beta = -0.04$, $F(1, 2571) = 3.99$, $p = .046$, $R^2 = .002$, with its direction opposite to the rigidity-of-the-right hypothesis and a significant curvilinear effect, $B = 0.12$, $SE = 0.02$, 95% CI [+0.08; +0.15], $\beta = 0.14$, $\Delta F(1, 2570) = 45.72$, $p < .0001$, $\Delta R^2 = .02$.

General Discussion

People on both political extremes categorize stimuli in the political domain more strongly than do moderates. They are more likely to cluster similar political stimuli closer together and form tighter, more homogeneous categories. This applies to a wide range of political stimuli, such as politicians (Study

1), groups associated with different ideologies (Study 2), or newspapers (Study 3), and also applies to the inferences that people make about politics—for example, how people vote across the country (Study 4) and whether politically different people share personal tastes (Study 5) or social relationships (Study 6–8).

The current work extends beyond existing work by its basic nature. Earlier research shows that people on the political extremes exaggerate differences across the political divide, see greater polarization in their opponents' attitudes, and are more dogmatic (Conway et al., 2016; Graham, Nosek, & Haidt, 2012; Van Boven et al., 2012; Westfall et al., 2015). The current findings fit with that literature but go beyond it by showing that people with strong political opinions not only have more extreme views but even represent the political domain differently. They categorize the same stimuli differently and perceive more homogeneous and separate categories than do moderates and neutrals.

As such, the current findings provide an unmotivated and purely perceptual explanation of many effects observed in political psychology. For example, the finding that those on the extremes have a more extreme opinion (Westfall et al., 2015) can be explained with the notion that strong categorization leads to larger perceived between-category differences (Krueger & Rothbart, 1990; Nosofsky, 1987). People with a strong political preference tend to engage in more biased information processing (Bartels, 2002; Taber, Cann, & Kucsova, 2009; Taber & Lodge, 2006; Westen, Blagov, Harenski, Kilts, & Hamann, 2006). This can be explained with the notion that categorization helps to process information more selectively (Bruner & Postman, 1949; Hamilton & Gifford, 1976). As a third example, people with a strong political preference see their opponents as more ideology driven (Chambers, Baron, & Inman, 2006; Chambers & Melnyk, 2006; Robinson, Keltner, Ward, & Ross, 1995). This fits with our findings because people who categorize strongly assimilate more strongly across same-category stimuli (Ames, 2004; Tenenbaum & Griffiths, 2001).

Political Sophistication and Other Limitations

Across these studies, we used various approaches to rule out the alternative explanation that these effects are driven by greater political knowledge and sophistication among those at the political extremes. First, we used stimuli that do not require sophistication but are instead easy to sort according to political ideology. For example, in Study 1, we used pilot testing to confirm that all participants were able to categorize the used stimuli correctly. Second, in Study 3, we measured categorization according to participants' ideographic beliefs about stimuli's political nature, rather than their objective ideological nature, thus bypassing any effect of sophistication. Third, in Study 4, we compared categorization strength and accuracy and found that stronger categorization shown by participants on the political extremes resulted in *less* accurate perception, compared to moderates, thus arguing against an explanation

based on them being more knowledgeable. Fourth, in Study 7, we found that experimentally increasing the salience of political ideology boosted the effect, which argues against the alternative explanation, because sophistication should not be affected by salience. Fifth, in Study 8, we directly measured differences in political knowledge and found that the quadratic effect remained significant after controlling for them. In summary, although results of individual studies may be vulnerable to an explanation based on political sophistication, together these studies solve that problem.

The methodological diversity of these studies also solves other possible concerns and confounds. For example, although the results of Study 6 may be explained by the notion that people with a strong political identity live in objectively more homogeneous social environments (Motyl, 2014; Schulz-Herzenberg, 2013), this cannot explain the results of the other studies.

One limitation to the current results was the exclusive reliance on MTurk samples. Although such samples target people from all walks of life and are therefore less unrepresentative than typical college student samples (Berinsky, Huber, & Lenz, 2012; Buhrmester, Kwang, & Gosling, 2011; Mason & Suri, 2011), replication of these results in a representative sample would be welcome. We did solve one of the most important concerns with MTurk samples, reduced naivety (Chandler, Pe'er, Paolacci, Mueller, & Ratliff, 2015), by disallowing participation in more than one study.

Implications

When differences between political groups or stimuli are large and real, drawing sharper political clusters and categories can increase the efficient use of cognitive resources, allowing people on the political extremes to draw inferences more quickly than the politically moderate (Allport, 1954; Bruner, 1957). On the other hand, it may lead people to exaggerate differences between categories and thus introduce oversimplified and erroneous thinking about a complex and multifaceted world (Allport, 1954; Fiske & Neuberg, 1990; Park & Judd, 2005). This explains why liberals and conservatives in the United States find it so difficult to connect. People on the political extremes may not only miss opportunities to connect across the partisan divide because of negative emotions or lack of motivation but also because in their perception of political reality there simply *is* no middle ground. In a reality that is characterized by growing polarization and a need for political nuance, awareness of such effects is of crucial importance (Haidt, 2012). If people with different political opinions are to live together in the same society, then they need to be able to perceive and understand the finer distinctions of their own and opposing political ideologies. If instead people see reality in black and white terms, then this can only lead to unproductive and uncivil disagreement.

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All data and materials will be shared upon request.

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Supplemental Material

The supplemental material is available in the online version of the article.

References

Allport, G. W. (1954). *The nature of prejudice*. Reading, England: Addison-Wesley.

Altemeyer, R. A. (1998). The other "authoritarian personality." In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 30, pp. 47–91). New York, NY: Academic Press.

Ames, D. R. (2004). Strategies for social inference: A similarity contingency model of projection and stereotyping in attribute prevalence estimates. *Journal of Personality and Social Psychology*, 87, 573–585.

Anderson, J. R. (1991). The adaptive nature of human categorization. *Psychological Review*, 98, 409–429.

Bartels, L. M. (2002). Beyond the running tally: Partisan bias in political perceptions. *Political Behavior*, 24, 117–150.

Berinsky, A. J., Huber, G. A., & Lenz, G. S. (2012). Evaluating online labor markets for experimental research: Amazon.com's Mechanical Turk. *Political Analysis*, 20, 351–368. doi:10.1093/polana/mpr057/-/DC1

Brandt, M. J., Reyna, C., Chambers, J. R., Crawford, J. T., & Wetherell, G. (2014). The ideological-conflict hypothesis: Intolerance among both liberals and conservatives. *Current Directions in Psychological Science*, 23, 27–34. doi:10.1177/0963721413510932

Brewer, M. D. (2005). The rise of partisanship and the expansion of partisan conflict within the American electorate. *Political Research Quarterly*, 58, 219–230.

Bruner, J. S. (1957). On perceptual readiness. *Psychological Review*, 64, 123–143.

Bruner, J. S., & Postman, L. (1949). On the perception of incongruity: A paradigm. *Journal of Personality*, 18, 206–223.

Brunswik, E. (1955). Representative design and probabilistic theory in a functional psychology. *Psychological Review*, 62, 193–217.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3–5.

Chambers, J. R., Baron, R. S., & Inman, M. L. (2006). Misperceptions in intergroup conflict: Disagreeing about what we disagree about. *Psychological Science*, 17(1), 38–45.

Chambers, J. R., & Melnyk, D. (2006). Why do I hate thee? Conflict misperceptions and intergroup mistrust. *Personality and Social Psychology Bulletin*, 32, 1295–1311. doi:10.1177/0146167206289979

Chambers, J. R., Schlenker, B. R., & Collisson, B. (2013). Ideology and prejudice: The role of value conflicts. *Psychological Science*, 24, 140–149.

Chandler, J., Pe'er, E., Paolacci, G., Mueller, P., & Ratliff, K. A. (2015). Non-naïve participants can reduce effect sizes. *Psychological Science*, 26, 1131–1139.

Chirumbolo, A. (2002). The relationship between need for cognitive closure and political orientation: The mediating role of authoritarianism. *Personality and Individual Differences*, 32, 603–610.

Conway, L. G. III, Gornick, L. J., Houck, S. C., Anderson, C., Stockert, J., Sessoms, D., & McCue, K. (2016). Are conservatives really more simple-minded than liberals? The domain specificity of complex thinking. *Political Psychology*. doi:10.1111/pops.12304

Cumming, G. (2014). The new statistics: Why and how. *Psychological Science*, 25, 7–29. doi:10.1177/0956797613504966

Delli Carpini, M. X., & Keeter, S. (1996). *What Americans don't know about politics and why it matters*. New Haven, CT: Yale University Press

Federico, C. M., & Hunt, C. V. (2013). Political information, political involvement, and reliance on ideology in political evaluation. *Political Behavior*, 35, 89–112. doi:10.1007/s11109-011-9184-7

Fiedler, K. (1996). Explaining and simulating judgment biases as an aggregation phenomenon in probabilistic, multiple-cue environments. *Psychological Review*, 103, 193.

Fiedler, K. (2011). Voodoo correlations are everywhere—Not only in neuroscience. *Perspectives on Psychological Science*, 6, 163–171. doi:10.1177/1745691611400237

Fiske, S. T., & Neuberg, S. L. (1990). A continuum of impression formation, from category-based to individuating processes: Influences of information and motivation on attention and interpretation. *Advances in Experimental Social Psychology*, 23, 1–74.

Frenkel-Brunswik, E. (1949). Intolerance of ambiguity as an emotional perceptual personality variable. *Journal of Personality*, 18, 108–143.

Gentzkow, M., & Shapiro, J. M. (2010). What drives media slant? Evidence from US daily newspapers. *Econometrica*, 78, 35–71. doi:10.3982/ECTA7195

Graham, J., Nosek, B. A., & Haidt, J. (2012). The moral stereotypes of liberals and conservatives: Exaggeration of differences across the political spectrum. *Plos One*, 7, e50092. doi:10.1371/journal.pone.0050092.t003

Haidt, J. (2012). *The righteous mind: Why good people are divided by politics and religion*. New York, NY: Random House LLC.

Hamilton, D. L., & Gifford, R. K. (1976). Illusory correlation in interpersonal perception: A cognitive basis of stereotypic judgments. *Journal of Experimental Social Psychology*, 12, 392–407.

Hout, M. C., Goldinger, S. D., & Ferguson, R. W. (2013). The versatility of SpAM: A fast, efficient, spatial method of data collection for multidimensional scaling. *Journal of Experimental Psychology: General*, 142, 256–281.

Jordan, T. L. (1999). *The US constitution: And fascinating facts about it*. Oak Hill Pub. Retrieved from www.constitutionfacts.com/?page=50QTest5.cfm

Jost, J. T., Glaser, J., Kruglanski, A. W., & Sulloway, F. J. (2003). Political conservatism as motivated social cognition. *Psychological Bulletin*, 129, 339–375. doi:10.1037/0033-2909.129.3.339

Jost, J. T., Napier, J. L., Thorisdottir, H., Gosling, S. D., Palfai, T. P., & Ostafin, B. (2007). Are needs to manage uncertainty and threat associated with political conservatism or ideological extremity? *Personality and Social Psychology Bulletin*, *33*, 989–1007. doi: 10.1177/0146167207301028

Kirton, M. J. (1978). Wilson and Patterson's conservatism scale: A shortened alternative form. *British Journal of Social and Clinical Psychology*, *17*, 319–323.

Koch, A., Alves, H., Krüger, T., & Unkelbach, C. (2016). A general valence asymmetry in similarity: Good is more alike than bad. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *42*, 1171–1192. doi:10.1037/xlm0000243

Koch, A., Imhoff, R., Dotsch, R., Unkelbach, C., & Alves, H. (2016). The ABC of stereotypes about groups: Agency/socioeconomic success, conservative–progressive beliefs, and communion. *Journal of Personality and Social Psychology*, *110*, 675–709. doi:10.1037/pspa0000046

Krueger, J., & Rothbart, M. (1990). Contrast and accentuation effects in category learning. *Journal of Personality and Social Psychology*, *59*, 651–663.

Layman, G. C., & Carsey, T. M. (2002). Party polarization and conflict extension in the American electorate. *American Journal of Political Science*, *46*, 786–802.

Mason, W., & Suri, S. (2011). Conducting behavioral research on Amazon's Mechanical Turk. *Behavior Research Methods*, *44*(1), 1–23. doi:10.3758/s13428-011-0124-6

McCarty, N., Poole, K. T., & Rosenthal, H. (2006). *Polarized America: The dance of ideology and unequal riches*. Cambridge, MA: MIT Press.

Moskowitz, G. B. (1993). Individual differences in social categorization: The influence of personal need for structure on spontaneous trait inferences. *Journal of Personality and Social Psychology*, *65*, 132.

Motyl, M. (2014). "If he wins, I'm moving to Canada": Ideological migration threats following the 2012 US Presidential Election. *Analyses of Social Issues and Public Policy*, *14*, 123–136.

Nosofsky, R. M. (1987). Attention and learning processes in the identification and categorization of integral stimuli. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *13*, 87.

Nosofsky, R. M., Clark, S. E., & Shin, H. J. (1989). Rules and exemplars in categorization, identification, and recognition. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *15*, 282.

Palfrey, T. R., & Poole, K. T. (1987). The relationship between information, ideology, and voting behavior. *American Journal of Political Science*, *31*, 511–530.

Park, B., & Judd, C. M. (2005). Rethinking the link between categorization and prejudice within the social cognition perspective. *Personality and Social Psychology Review*, *9*, 108–130.

Pattyn, S., Rosseel, Y., & Van Hiel, A. (2012). Finding our way in the social world. *Social Psychology*, *44*, 329–348. doi:10.1027/1864-9335/a000130

Robinson, R. J., Keltner, D., Ward, A., & Ross, L. (1995). Actual versus assumed differences in construal: "Naive realism" in intergroup perception and conflict. *Journal of Personality and Social Psychology*, *68*, 404–417.

Rokeach, M. (1956). Political and religious dogmatism: An alternative to the authoritarian personality. *Psychological Monographs*, *70*, 1–43.

Schulz-Herzenberg, C. (2013). The implications of social context partisan homogeneity for voting behavior: Survey evidence from South Africa. *Proceedings of World Academy of Science, Engineering and Technology*, *80*, 251–267.

Sidanius, J. (1978). Intolerance of ambiguity and socio-politico ideology: A multidimensional analysis. *European Journal of Social Psychology*, *8*, 215–235.

Sidanius, J. (1984). Political interest, political information search, and ideological homogeneity as a function of sociopolitical ideology: A tale of three theories. *Human Relations*, *37*, 811–828.

Sidanius, J. (1988). Political sophistication and political deviance: A structural equation examination of context theory. *Journal of Personality and Social Psychology*, *55*, 37–51.

Sidanius, J., & Lau, R. R. (1989). Political sophistication and political deviance: A matter of context. *Political Psychology*, *10*, 85–109.

Stangor, C., Lynch, L., Duan, C., & Glas, B. (1992). Categorization of individuals on the basis of multiple social features. *Journal of Personality and Social Psychology*, *62*, 207–218.

Taber, C. S., Cann, D., & Kucsova, S. (2009). The motivated processing of political arguments. *Political Behavior*, *31*, 137–155.

Taber, C. S., & Lodge, M. (2006). Motivated skepticism in the evaluation of political beliefs. *American Journal of Political Science*, *50*, 755–769.

Tajfel, H., & Wilkes, A. L. (1963). Classification and quantitative judgment. *British Journal of Psychology*, *54*, 101–114.

Tenenbaum, J. B., & Griffiths, T. L. (2001). Generalization, similarity, and Bayesian inference. *Behavioral and Brain Sciences*, *24*, 629–640.

Tetlock, P. E. (1984). Cognitive style and political belief systems in the British House of Commons. *Journal of Personality and Social Psychology*, *46*, 365–375.

Toner, K., Leary, M. R., Asher, M. W., & Jongman-Sereno, K. P. (2013). Feeling superior is a bipartisan issue: Extremity (not direction) of political views predicts perceived belief superiority. *Psychological Science*, *24*, 2454–2462. doi:10.1177/0956797613494848

Tversky, A. (1977). Features of similarity. *Psychological Review*, *84*, 327–352.

Tversky, A., & Gati, I. (1982). Similarity, separability, and the triangle inequality. *Psychological Review*, *89*, 123–154.

Unkelbach, C., Fiedler, K., Bayer, M., Stegmüller, M., & Danner, D. (2008). Why positive information is processed faster: The density hypothesis. *Journal of Personality and Social Psychology*, *95*, 36–49. doi:10.1037/0022-3514.95.1.36

Van Boven, L., Judd, C. M., & Sherman, D. K. (2012). Political polarization projection: Social projection of partisan attitude extremity and attitudinal processes. *Journal of Personality and Social Psychology*, *103*, 84–100. doi:10.1037/a0028145

Van Hiel, A., & Mervielde, I. (2003). The measurement of cognitive complexity and its relationship with political extremism. *Political Psychology*, *24*, 781–801.

Van Hiel, A., Pandelaere, M., & Duriez, B. (2004). The impact of need for closure on conservative beliefs and racism: Differential

mediation by authoritarian submission and authoritarian dominance. *Personality and Social Psychology Bulletin*, *30*, 824–837.

Van Prooijen, J. W., Krouwel, A. P. M., & Pollet, T. V. (2015). Political extremism predicts belief in conspiracy theories. *Social Psychological and Personality Science*. doi:10.1177/1948550614567356

Webster, D. M., & Kruglanski, A. W. (1994). Individual differences in need for cognitive closure. *Journal of Personality and Social Psychology*, *67*, 1049–1062.

Westen, D., Blagov, P., Harenski, K., Kilts, C., & Hamann, S. (2006). Neural bases of motivated reasoning: An fMRI study of emotional constraints on partisan political judgment in the 2004 US Presidential Election. *Journal of Cognitive Neuroscience*, *18*, 1947–1958.

Westfall, J., Van Boven, L., Chambers, J. R., & Judd, C. M. (2015). Perceiving political polarization in the United States: Party identity strength and attitude extremity exacerbate the perceived partisan divide. *Perspectives on Psychological Science*, *10*, 145–158. doi: 10.1177/1745691615569849

Zaller, J. R. (1992). *The nature and origins of mass opinion*. Cambridge, England: Cambridge University Press.

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