

5. Social Media and Political Polarisation

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The rise in populism in the Western world, most evident in the results of the 2016 Brexit referendum and the 2016 United States presidential election, has often been connected with the rise of social media. The unique character of social media has allowed extreme and polarised beliefs, two of the most identifiable features of populism, to emerge and spread in society through permitting the creation of echo chambers on a new larger scale, and providing new means for political campaigners and interested third parties to influence voter opinion. The abundance of information on social media might trigger voters to use simple heuristics to aggregate multiple sources of information. In this chapter we report on several studies that focus on the implications of one such documented bias: ‘correlation neglect’, the propensity to treat information sources as if they are (conditionally) independent. We discuss the relation between correlation neglect and polarisation in opinions and party platforms. We also discuss how targeted political campaigns in the presence of correlation neglect may bias voters from different groups in different directions. Specifically, competition in targeted social media campaigns increases polarisation among extreme voters but at

the same time increases the randomness and unpredictability of moderates' voting behaviour. These findings are consistent with new data on the evolution of US voters' opinions in the last five decades. The data show a significant change in the trajectory of the opinions of moderates versus extreme voters starting from the mid-1990s, which is consistent with the rise in the ability of campaigns more effectively to target and bombard voters with information through social media.

Keywords

Correlation Neglect; Polarisation; Extremism

1. Introduction

In seeking to explain the rise of populism in the Western world, most clearly seen in the results of the United Kingdom's Brexit referendum and America's 2016 presidential election, many have pointed to the role of social media. The unique features of social media have allowed extreme and polarised beliefs, two core features of populism, to take root and spread in society. Social media can generate echo chambers where already extreme and unsubstantiated beliefs become established and multiply, while they also provide new means for political campaigners and interested third parties to influence and manipulate voter opinion.

In this chapter we explore the connection between populist success and social media using recent insights from behavioural economics, considering the relationship between demand and supply factors in the market for information. We find that on the

demand side, voters' natural tendency to move into echo chambers is exacerbated by social media and that this increases the risk of polarisation. This risk is further increased by activity on the supply side, where politicians and third parties deliberately attempt to manipulate voters' beliefs. They do this not only by targeting susceptible individuals on social media, but also through using the data gained on voters' opinions to shift their policies. Given that voters are often moving towards the extremes as a result of echo chambers and manipulation, this can result in progressively more extreme policies, creating a self-perpetuating shift towards polarised extremes on both sides.

Within this chapter we focus on how polarisation can result from voters being overloaded with information on social media. Voters receive information from various traditional media sources, both offline and online, as well as from social media sources. The sheer abundance of information can mean that voters develop simple methods of processing and comprehending these multiple sources of information. Recent studies have shown that one such method involves the voters adopting 'correlation neglect', where they disregard the original source of information, and treat each piece of information as though they are provided independently of the others.

Voters prone to adopting correlation neglect are at risk of ending up with more extreme and polarised beliefs. These are also the voters that are potentially at greater risk of manipulation by political campaigns, given that such campaigns tend to operate by bombarding would-be voters with information. Such information is likely to be interpreted by these susceptible voters as confirmation of their beliefs, unaware that it is generated, ultimately, by the same source. This will also incentivise campaigns to set up

multiple secondary organisations, giving a more effective illusion of independence while ensuring a consistent message.

Given this incentive, it is alarming that there is little regulation of such activity. Organisations with a similar database of individuals can provide this information to their symbiotic organisations, who then conceal the fact they come from the same host organisation. Such coordination and obfuscation enhance the correlation neglect of the voters, who will see each piece of similar (if not identical) information as independent and uncoordinated. Recent years have exposed the extent to which this has taken place, with one of the most notable examples being the indictment of Russian agents in the US, accused of using social media to manipulate voters in the 2016 presidential election.

The operation of such campaigns in the UK was reported on by the Guardian. This report shows

a series of hugely influential Facebook advertising campaigns that appear to be separate grassroots movements for a no-deal Brexit [...] The mysterious groups, which have names such as Mainstream Network and Britain's Future, appear to be run independently by members of the public and give no hint that they are connected. But in reality, they share an administrator who works for Crosby's CTF Partners and have spent as much as £1 m promoting sophisticated targeted adverts aimed at heaping pressure on individual MPs to vote for a hard Brexit.¹

Below we focus on the implications of correlation neglect in the political sphere. We discuss how correlation neglect contributes to the polarisation of views, how it can induce politicians to polarise

their platforms, and how strategic politicians and campaigners can abuse the fact that voters neglect correlation to increase their political support. In particular, we show how targeting specific types of voters with specific types of messages can increase the polarisation of the already relatively extreme voters. We also present data that shows how political targeting affects American voters' beliefs.

2. Correlation Neglect

Economists have traditionally assumed that individuals are proficient in harvesting and analysing information from their surroundings. In contrast, both political scientists and psychologists take a more pessimistic view of peoples' ability to process information. In political science, a large literature documents the incompetency of voters in collecting and processing information. Bartels and Delli Carpini and Keeter have shown voters are poorly informed about what they vote on and use the information they do have incorrectly [1–5]. Psychologists have also subjected the rationality assumption in economics to scrutiny – most notably Kahneman and Tversky in a series of seminal papers where they revealed the biases that emerge in individuals exposed to different pieces of information. These results have spurred more recent research that incorporates some of these behavioural biases into political economy models used to analyse polarisation, extremism, and the prevalence of wrong beliefs.

In this section we explain the central behavioural assumption we make about how voters aggregate multiple pieces of information. Start by considering our daily interactions with the resources and people around us. We spend our day reading

newspapers and online news content, talking to friends, family, and colleagues at work, while also spending some time on social networks. Daily, this might amount to large quantities of information, much of which is not easily aggregated and distilled into distinct categories and therefore not processed properly.

With regard to social media, information is constantly repackaged and repeated online, and it is very difficult to detect the independent information content, if any, conveyed in the different, semi-repeated messages. A study by Cagé and colleagues of copyright in news media documents how pieces of news are often copied multiple times and across different outlets, finding that only 32% of online content is original [6]. Despite the prevalence of copying, the imitating media outlets rarely name the sources they copy. Thus, readers are exposed to repeated news stories but see them as corroborative rather than imitative, as it is highly unlikely they are aware they are rooted in the same source. This lack of source material is even more apparent in direct social interactions, both offline and online, where there is rarely any way of sourcing the information provided by a friend or colleague. It may be repetition of information you yourself gave out or information that has boomeranged through a sequence of contacts and then back to you. The nature of echo chambers means that communication will often contain information that is repetitive but instead is treated as correlative. This therefore leads to readers treating different pieces of information as independent evidence, which we term correlation neglect.²

In the Appendix we formally outline a simple model of correlation neglect. Individuals try to learn about the state of the

world ω , which could be high (h) or low (l). They all have a common prior assumption that the states are equally likely. For example, the state could correspond to the fate of the UK after Brexit, where a low state implies low growth and a high state high growth. Information about the state variable will inform voters how to vote in a referendum about Brexit.

In the model, individuals start with some initial beliefs formed by being exposed to some informative source (e.g., a newspaper article). When individuals interact in their social network they share their opinions on that topic with each other. For simplicity we can assume that individuals share their true beliefs with each other. When exposed to these different opinions, how do individuals update their beliefs?

Those individuals with correlation neglect treat each piece of information, regardless of its source, as conditionally independent. As we show in the Appendix, this implies a multiplicative form to the way they aggregate what they heard from others. This form of aggregation implies a propensity to adopt excessively extreme views that are held with overconfidence. If there are two echo chambers, one filled with those who have high beliefs and one with low beliefs, the natural consequence will be progressively more polarisation.

3. Extremism and Overconfidence

Ortoleva and Snowberg use a similar model to the one described above and test its predictions on data from the 2010 Cooperative Congressional Election Study (CCES) in order to assess how correlation neglect shapes political views [7]. In their model, individuals receive information as set out above and use this

information to try to understand what the true state of the world is. In addition, every voter has an ideological parameter. The stronger a person's right-wing ideology, the more willing he or she will be to vote for right-wing parties.

Their main finding was that there is positive correlation between overconfidence and ideological extremism. They found that (i) overconfidence increases with the number of signals an individual is exposed to; (ii) that when the true correlation in information is large enough, then the dispersion of ideologies in society increases in the number of signals circulating; (iii) and that ideologically extreme individuals are more likely to turn out to vote. In addition, the paper finds that there is a positive relationship between correlation neglect and the age of the individual, his/her tendency towards extremism, and their likelihood of turning out to vote. Specifically, older individuals can, in part because of correlation neglect, be both more confident and more extreme in their beliefs and more likely to vote.

4. Correlation Neglect and Polarisation of Policies

It has been suggested that the increased polarisation of American politics and institutions is a result of the increasingly polarised nature of voters' political values. Political actors are motivated to accommodate their voters' preferences in order to be re-elected, resulting in a polarised Congress [8]. The assumption that increased polarisation within the franchise leads to the polarisation of policies is explored by us elsewhere [9]. That paper suggests that a more polarised electorate affects policy development in two ways. First, politicians are not likely to be

inhibited in moving further into their ideology. A left-wing politician will not worry overly about moving to the left and vice versa. This is due to the electoral system effect, which implies that a right-wing politician would worry less about moving to the right because she has a sufficiently high vote share in that segment of society.

However, this tendency is likely to be checked by the second factor, that of appealing to marginal voters. While each ideology's core voters are secure, marginal voters are not, and the need to appeal to them may keep the policies – or at least some of them – within an area of moderation.

The above results illustrate that policy polarisation depends on the competitiveness of elections. Elections are most obviously competitive if the two sides expect to have a close vote share, but the degree of competition can also be affected by the electoral system. For instance, first past the post tends to be more competitive than proportional representation. In highly competitive electoral contests, a candidate's probability of winning is highly sensitive to their expected vote share. Therefore, the electoral system effect dominates, and correlation neglect leads to more polarisation of opinions and policies. If the contest is uncompetitive, the marginal voter effect will have a bigger role, and so correlation neglect may lead to reduced polarisation in candidate positions.

5. Correlation Neglect and Targeted Campaigns

In addition to responding to voters' preferred policies, extreme or otherwise, politicians may seek to manipulate voters' beliefs, particularly through social media. Social media allows politicians to

target individual voters cheaply and directly. In addition, campaigns sympathetic to the same agenda may coordinate their actions, as the Cambridge Analytica scandal over Brexit demonstrated. When such groups coordinate with political parties, their views gain legitimacy in the audience's eyes due to the perceived independence of each source of information, which is treated as a unique verifier of the claim, rather than being part of a collective whole.

In a recent paper, Levy and colleagues analyse a model of targeted and coordinated campaigns [10]. The model assumes that voters' opinions can be manipulated and that such manipulation is possible in part because voters are unaware of the correlation between the sources of information. Their analysis suggests that as correlation neglect and campaign coordination grow, extreme voters become more extreme, while moderates become confused and unpredictable.

In that model, the choice on the issue that the voters are interested in is either *l* or *h*. There are two campaign coordinators, each supporting a particular position, in this case leaving or remaining in the EU, and each possessing the capacity to coordinate *n* campaigns, ensuring that they all offer a consistent but seemingly independent line of argument. When voters receive each message, they therefore perceive it as an individual piece of data. The ability of the coordinators is further enhanced by the fact that they can alter the nature of the message to suit the target audience (i.e., more extreme voters can be manipulated with more extreme messaging and vice versa).

With extreme voters, the intention is to 'mobilise' them, intensifying their beliefs so that they become campaigners, in turn swaying moderate voters. As these voters are able to pull moderates to their side, they then also enter the 'echo chamber',

cutting them off from other perspectives. The success of such campaigns can thus result in increased polarisation [10].

In contrast, moderate voters receive information from both sides. If correlation neglect is presumed to also influence these voters, they will be persuaded by the side that is able to provide them with the most overwhelming amount of information. Therefore, the campaigns bombard such voters. They also introduce strategic noise, whereby the campaign deliberately tries to counter information offered by the competing campaign. Unsurprisingly, the confused nature of the campaigning results in confused and unpredictable outcomes.

6. Confused Centrists and Polarised Extremes: Empirical Evidence

The results discussed above suggest that with more targeted campaigning we would expect to see the opinions of different groups of voters moving in different ways. Specifically, as correlation neglect, campaign coordination, and voter targeting all become more prevalent, extreme voters should become more polarised and so even further removed from the views of the moderates. Meanwhile, the confused centrists will orient themselves towards the competing ideologies chaotically or remain isolated from both.

Such expectations are matched by the data [10]. Assessing American National Election Studies (ANES) and General Social Survey (GSS) data from the last five decades demonstrates strong differences of opinion between liberals and conservatives on a vast variety of issues. For example, in the ANES data, on the 100-point scale question of ‘feeling thermometer towards liberals/conservatives’ this correlation was -0.61 before 1990 and -0.81 afterwards.

Similarly, in the GSS data, on a 7-point ideology question, the correlation was almost 0 pre 1990 but -0.88 afterwards.

While the partisans on either side grow apart and more cohesive, so independents begin to share relatively little with either side. This is visible in both the ANES and GSS data, with an average correlation of 0.24 between liberals and moderates and 0.05 between conservatives and moderates – although this does suggest that liberals are more appealing to the moderate voter than conservatives. In **Figure 5.1** we show the evolution of the difference in opinion between Republicans and Democrats and between moderates leaning towards Republicans and moderates leaning towards Democrats.³

In line with our model in Section 5, the data also show that voters have been exposed to different campaigns and that these

Figure 5.1: The evolution of the polarisation between extremists and between moderates in the last five decades. (GSS data)

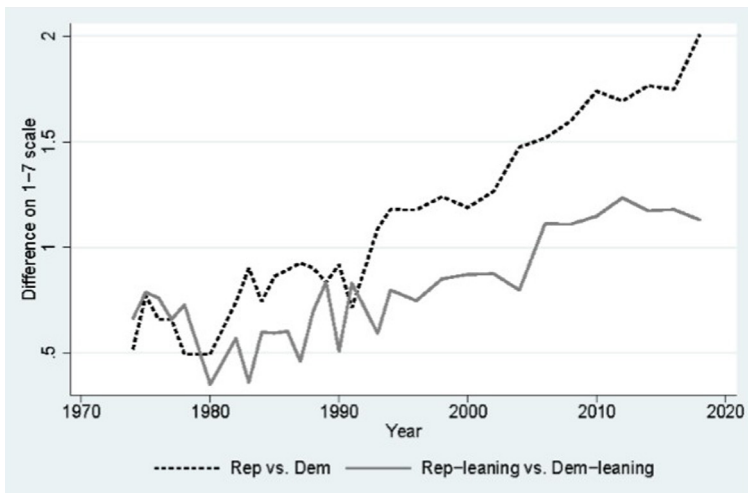
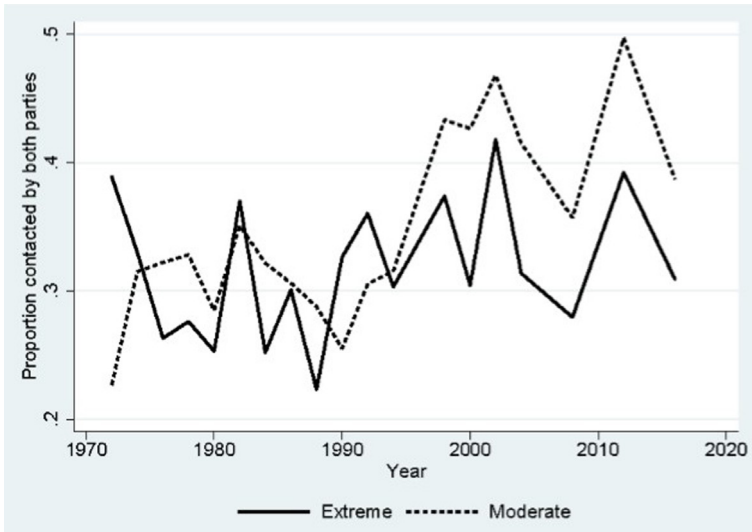


Figure 5.2: The proportion of voters approached by both parties in the last five decades



had become more targeted over time. According to the ANES data, when asked about which parties have approached them, in 1994, 30% of extreme voters said that both parties had, and moderate voters were similarly exposed at 32%, a statistically insignificant distinction. However, in 2016, the numbers had changed to 31% and 38%, respectively. While these are just correlations, they are suggestive of the possibility that the nature of the competition to influence voters might have a hand in generating the above patterns of voters' opinions (see **Figure 5.2**).

7. Conclusion

In this survey we report results from a new emerging literature in political economy, which explores how behavioural biases affect

political positions and opinions. Specifically, we explain how the inability of voters to correctly understand large amount of data, and their tendency to neglect the correlation across the pieces of data they observe, can lead to extremism and polarisation. In competitive electoral systems, the response of politicians will be to polarise their platforms even more. Correlation neglect biases also induce strategic politicians and campaigners to target the types of voters they can reach differently. Such targeted campaigns imply that extreme voters will become even more polarised, while swing voters' views will become more volatile and unpredictable. We present new data consistent with these findings here.

The above results shed light on the role that social media and its effects on political campaigns might play in promoting the rise of populism in recent years. Understanding the behavioural traits of voters together with the strategic manipulation of information by political campaigns can help explain the spread of extreme and populist opinions and world views. More importantly, understanding these forces and establishing them empirically will enable us to find better ways to regulate political campaigns and social media companies, to educate and change the way voters process information, and in general to maintain a better public debate of politics.

8. Appendix I: Sources and Computation of Data

Correlations over time: ANES data (18 observations over the period 1972–2016):

1. Respondents are split by ideology based on their answer to the question: 'Here is a 7-point scale on which the political views that people might hold are arranged

from extremely liberal to extremely conservative. Where would you place yourself on this scale? Respondents who answered 1 or 2 are classified as 'liberal', respondents who answered 3, 4, or 5 are classified as 'moderate', and those who answered 6 or 7 are classified as 'conservative'.

2. Within each group (liberal, moderate, conservative) and for each year, we take the average difference in the answer to the feeling thermometer question towards Conservatives and towards Liberals and obtain the average 'net feeling' towards Conservatives per ideological group and per year.⁴

The correlations over time of this average ideology between different groups are

$$\text{corr}(\text{feeling_liberal}_{\{t\}}, \text{feeling_conservative}_{\{t\}}) = -0.78$$

$$\text{corr}(\text{feeling_liberal}_{\{t\}}, \text{feeling_moderate}_{\{t\}}) = 0.24$$

$$\text{corr}(\text{feeling_conservative}_{\{t\}}, \text{feeling_moderate}_{\{t\}}) = -0.05$$

Restricting the sample to years before 1990, the correlation between Liberals and Conservatives is -0.61 . Restricting it to years after 1990, this correlation is -0.81 .

Correlations over time: GSS data (30 observations over the period 1972–2016):

1. Respondents are split by partisanship based on their answer to the question: 'Generally speaking, do you usually think of yourself as a Republican, Democrat, Independent, or what?' Respondents who answered 1 or 2 (Strong Democrat; Not very strong Democrat) are

classified as ‘Democrats,’ respondents who answered 3, 4, or 5 (Independent, close to Democrat; Independent; Independent, close to Republican) are classified as ‘Independents,’ and those who answered 6 or 7 (Not very strong Republican; Strong Republican) are classified as ‘Republicans.’

2. Within each group (Democrats, Independents, Republicans) and for each year, we take the average value of the answer to the question

We hear a lot of talk these days about liberals and conservatives. I’m going to show you a seven-point scale on which the political views that people might hold are arranged from extremely liberal—point 1—to extremely conservative—point 7. Where would you place yourself on this scale?

The correlations over time of this average ideology between different groups are

$$\text{corr}(\text{ideology_democrat}_{\{t\}}, \text{ideology_republican}_{\{t\}}) = -0.82$$

$$\text{corr}(\text{ideology_democrat}_{\{t\}}, \text{ideology_independent}_{\{t\}}) = -0.11$$

$$\text{corr}(\text{ideology_republican}_{\{t\}}, \text{ideology_independent}_{\{t\}}) = 0.29$$

Restricting the sample to years before 1990, the correlation between Democrats and Republicans is 0.09. Restricting it to years after 1990, this correlation is -0.88.

Polarisation over time (data for **Figure 5.1**).

We plot the difference in the group average answer to the ideology question of the GSS between respondents who identify as Strong Republican or Not very strong Republican and respondents who identify as Strong Democrat or Not very strong Democrat.⁵ This gives the line ‘Rep vs. Dem.’ We then calculate the difference in group average to that question between respondents who identify as ‘Independent, close to Republican’ and those who identify as ‘Independent, close to Democrat.’ This gives the line ‘Rep-leaning vs. Dem-leaning’.

Communication with parties.

1. Respondents are classified as ‘moderate’ if they answered 3, 4, or 5 to the ideology question in the ANES survey and extreme if they answered 1, 2, 6, or 7.⁶
2. Within each group (extreme and moderate) and for each year, we calculate the proportion of respondents who were contacted by both parties out of the number of respondents who were contacted by at least one party.⁷

These proportions are plotted in **Figure 5.2**. Averaged over the whole period (1972–2016), 33% of extreme voters who were contacted were contacted by both groups, but 38% of moderate voters were. In 1994 the proportions were 30% vs. 32% and not statistically different (even at the 10% level), whereas in 2016 they were 31% vs. 38% and statistically different (at the 1% level). The difference over the whole time period is statistically significant (at the 1% level) and remains significant (at the 1% level) after controlling for self-identified partisanship, demographic

controls (including age, gender, education, income, and work status) and year.

9. Appendix II: A Formal Model of Correlation Neglect

In this appendix we formally introduce the model discussed in Section 2.

Suppose we have n individuals. Individuals start with some beliefs about the states. Let q^i denote the belief of individual i that the state is high, with $1 - q^i$ denoting the belief of that individual that the state is low. The individual's belief could have been generated by receiving a signal $s \in \{l, h\}$, with an accuracy $\Pr(s = h | \omega = h) = \Pr(s = l | \omega = l) = q \geq \frac{1}{2}$. In this case, Bayes rule implies that receiving a signal h will yield the (high) belief $q = \Pr(\omega = h | s = h)$, and receiving a signal l will yield the (low) belief that $\Pr(\omega = h | s = l) = 1 - q$, and so $q^i \in \{q, 1 - q\}$. For example, this signal could be generated by reading an informative newspaper article about the effects of Brexit on the UK labour market.

When individuals interact in their social network, they share their opinions with each other. To focus attention on cognitive biases, rather than any strategic considerations, let us assume that individuals share their true beliefs with each other. When exposed to these different opinions, how do individuals update their beliefs?

Those individuals with correlation neglect treat each piece of information, regardless of its source, as conditionally independent. If individuals neglect this correlation, then their new correlation neglect (CN) belief, q^{CN} , will be determined as follows: If a share α of N individuals had received the h signal and have belief $q > \frac{1}{2}$, and a share $1 - \alpha$ had received the l signal

and have belief $1-q < \frac{1}{2}$, then if all exchange their beliefs, we have that

$$q^{CN} = \frac{q^{\alpha N} (1-q)^{(1-\alpha)N}}{q^{\alpha N} (1-q)^{(1-\alpha)N} + (1-q)^{\alpha N} q^{(1-\alpha)N}}$$

with q^{CN} becoming very close to 1 for a large N and $\alpha > \frac{1}{2}$, and q^{CN} becoming very close to 0 for a large N and $\alpha < \frac{1}{2}$.

If, for example, the true information structure that had generated these initial beliefs involves correlation, so that all those that received the same signal had the same information source, then post-communication beliefs would become excessively extreme and moreover the individuals holding these beliefs would be overly confident in these beliefs.

To see more generally how belief updating with correlation neglect leads to extremism and polarisation, note that the above implies that if the beliefs are all higher (lower) than a half, then updated beliefs would be higher (lower) than the maximum (minimum) belief in the set. For example, if $\alpha = 1$, then the correlation neglect belief q^{CN} will satisfy $q^{CN} > q$. If $\alpha = 0$, then $q^{CN} < 1 - q$.

Competing Interests

The authors have no competing interests to declare.

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Notes

¹ For more on this see, <https://www.theguardian.com/politics/2019/apr/03/grassroots-facebook-brexit-ads-secretly-run-by-staff-of-lynton-crosby-firm>.

² Another problem that could make your inference complicated is related to the composition of your social network. In particular, one reason you like talking to the people you talk to is because they are similar to you. Therefore, they will most likely say things that agree with your own views. In these cases, some individuals might err by over-weighting what friends or colleagues say due to a selection bias.

³ See the Appendix for more details about the data.

⁴ The feeling thermometer question is

There are many groups in America that try to get the government or the American people to see things more their way. We would like to get your feelings towards some of these groups. I have here a card on which there is something that looks like a thermometer. We call it a ‘feeling thermometer’ because it measures your feelings towards groups. If you have a warm feeling toward a group or feel favorably toward it, you would give it a score somewhere between 50 degrees and 100 degrees, depending on how warm your feeling is toward the group. On the other hand, if you don’t feel very favorably toward some of these groups—if there are some you don’t care for too much—then you would place them somewhere between 0 degrees and 50 degrees.

⁵ ‘We hear a lot of talk these days about liberals and conservatives. I’m going to show you a seven-point scale on which the political views that people might hold are arranged from extremely liberal—point 1—to extremely conservative—point 7. Where would you place yourself on this scale?’

⁶ Ideology question in ANES is ‘Here is a 7-point scale on which the political views that people might hold are arranged from extremely liberal to extremely conservative. Where would you place yourself

on this scale, or haven't you thought much about this?' With possible answers 1. Extremely liberal, 2. Liberal, 3. Slightly liberal, 4. Moderate, middle of the road, 5. Slightly conservative, 6. Conservative, 7. Extremely conservative, 9. Don't Know; haven't thought much about it.

⁷ We code as contacted by both parties respondents who answered '3. Yes, contact: both major parties' to the question: 'The political parties try to talk to as many people as they can to get them to vote for their candidate(s). Did anyone from one of the political parties call you up or come around and talk to you about the campaign?' IF YES: Which party was that? Respondents who answered 'Don't know' or 'Not contacted' are dropped. The proportion of respondents who have been contacted but not by a major party (answered 4) or who did not know or did not answer which party contacted them (answered 5 or 6) is 2.1% over the whole sample; the proportion of respondents who have not been contacted at all is 70% over the whole sample.

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