**Supplementary Information**

**Crossing the Line: Evidence for the categorization theory of spatial voting**

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**Supplementary Information 1:** **Field Dates and Sampling Procedures**

The field dates and number of completed questionnaires for each study are indicated in Tables A.1 and A.2.

Table A.1. U.S. Surveys

|  |  |  |
| --- | --- | --- |
| Study | Dates | *N* |
| Main | 23rd to 28th September 2015 | 3000 |

Table A.2. British Surveys

|  |  |  |
| --- | --- | --- |
| Study | Dates | *N* |
| Main | 14th to 19th June 2015 | 3219 |
| Real parties robustness check | 6th to 7th April 2016 | 3333 |
| Party A robustness check | 6th to 7th April 2016 | 1919 |

*Sampling Procedure*

YouGov relies on a large volunteer opt-in panel of about 800,000 British adults and 175,000 American adults, who are recruited from a variety of different sources. At the time of recruitment, background demographics are collected for all panellists. These demographics are updated regularly.

Through *active sampling* (targeted quota sampling) a nationally representative sub-sample is drawn from the larger panel using the following demographic characteristics. Britain: age and gender; region; social grade; party identification; and newspaper readership. U.S.: gender; age; race; education; political ideology; geographic region; voter registration. Target percentages for the British sample are derived from Census data and the National Readership Survey.[[1]](#footnote-1) For the U.S. sample, the 2014 American Community Study and the 2014 Current Population Survey Registration and Voting Supplement is used.

The individuals in the sub-sample are sent an invitation email and receive a small cash incentive for participating in the survey, ensuring that not only the most interested individuals participate in the survey. Only the individuals in this sub-sample have access to the questionnaire through the username and password they receive in the invitation email, and these individuals are allowed to fill in the survey only once. YouGov’s proprietary software looks at all surveys that currently need panel members, and calculates how many people to send invites to every 30 minutes.

**Supplementary Information 2:** **Question Wording**

British version

Q1. Ideological self-placement question

Timeline

Description automatically generated

Q2. Norms question

Graphical user interface, application

Description automatically generated

Note: Bold “right wing people” or “left wing people” is based on the respondent’s position

Q3. Vote question

Graphical user interface, timeline

Description automatically generated

Q4. Social Conservatism index

Table

Description automatically generated

U.S. version

*Q1. Ideological self-placement question*

Graphical user interface, Word

Description automatically generated with medium confidence

*Q2. Norms question*

Timeline

Description automatically generated

Note: Bold “Conservatives” or “Liberals” is based on the respondent’s position

Q3. Vote question

Graphical user interface, timeline

Description automatically generated

**Supplementary Information 3:** **Balance Tests**

Figure A.1. Balance Test, Britain



Null hypothesis = balance

Overall test of balance: (38) = 31.72; *P*-value = 0.7540

Figure A.2. Balance Test, U.S.



Null hypothesis = balance

Overall test of balance: (24) = 25.37; *P*-value = 0.3860

**Supplementary Information 4:** **Strength of Vote Norm by Strength of Identity**

An implication of our theory is that the vote norm will be stronger for individuals with stronger identities. Mason (2018) demonstrates the moderate correlation between extremity of ideological self-placement and strength of ideology as an identity. On that basis, we would expect those that place themselves in a more extreme ideological position to express a stronger vote norm compared to those closer to the centre of the spectrum.

We calculated the vote norm (measured by Q2) by placement on the spectrum. The norm is measured as the difference in the average response for those that viewed party B on the same side of the spectrum versus those that view the party on the opposite side. For individuals at each point on the ideological spectrum, the difference in averages is calculated over an interval of plus or minus 5 units on the ideological self-placement scale. For example, the norm for those that placed themselves at 30 is calculate over respondents that place themselves between 25 and 35.

Figure A.3 plots the strength of the vote norm against ideological placement. We have relatively small sample sizes in each cell, so the 90% confidence intervals are correspondingly big but the vote norm is largest for those with the most extreme ideological identities. We interpret this to mean that the vote norm is strongest for those with the strongest identities.

This is the measure of vote norm strength used to calculate the results presented in Figure 4 of the main text: the strength of the vote norm for an individual is based on the responses to the norm question for individuals with the same (similar) self-placement on the left/right spectrum.

Figure A.3. Norm Strength by Ideological Placement

UK



U.S.



**Supplementary Information 5:** **Robustness Checks**

*Robustness Check: Control for Partisan Identity*

Could observed effects be due to partisan rather than ideological identity? After all, political identities, such as ideological and partisan identities, do not develop independently (Inglehart and Klingemann 1976), and an individual with too large a discrepancy between the two might feel dissonance (Festinger 1957). If political identities develop together, when one identity (e.g., the ideological identity) is made salient, other political identities (e.g., the partisan identity) are likely also made salient. When individuals consider a hypothetical or unknown party on the right, they may have in mind familiar right-wing parties (and the policies those parties pursue), and when they consider parties on the left, they may have in mind familiar left-wing parties. However, even if this is how individuals distinguish left- and right-wing, ideological identity is an independent concept that can be applied when a partisan identity is unavailable – for example, when evaluating a new or hypothetical party. One cannot have a partisan attachment to a party that one knows nothing about other than where it sits on the ideological spectrum.

That said, if respondents presented with a hypothetical party believe that hypothetical party to actually be an existing political party, their responses could be influenced by their partisan reaction to that party. As a robustness check, we ran the survey (on a British sample of 3,333) including the positions of the actual parties (as identified by other YouGov respondents) in the norm question (Q2).

Graphical user interface, timeline

Description automatically generated

By providing the position of the existing parties, we make it clear that hypothetical party B is not one of these existing parties. The resulting difference, between the treatment and control groups, in the responses to Q2 was -0.36 (SE = 0.10; *N* = 1,397; *P*-Value < 0.001). This result is very similar to the one we observed when the existing parties were not placed on the ideological spectrum (the results reported in the text). This suggests that individuals are not substituting in their mind the hypothetical party with an existing party when responding to the question.

*Robustness Check: Effect of Hypothetical Party A*

Does the presence of hypothetical party A affect responses regarding hypothetical party B? To test the effect that hypothetical party A had on responses to questions about hypothetical party B, we reran the survey (on a British sample of 1,919) excluding questions about party A. We also did not place hypothetical party A on the spectrum. The resulting difference, between the treatment and control groups, in the responses to the norm question (Q2) was -0.70 (SE = 0.15; *N* = 742; *P*-value < 0.001). The magnitude of the result is about twice those observed when party A was included on the spectrum. It would appear that the impact of hypothetical party A was to reduce the effects. It looks like this is because the presence of party A reduces the appeal of party B for both treatment and control groups.

*Robustness Check: Comparing the Result to Proximity and Directional Models*

We assess the robustness of our findings to minor changes in distance. We do so first assuming a proximity voting model and then assuming a directional voting model.

Proximity voting model: We estimate the effect of a one-unit increase in the distance of a candidate from the voter (when the candidate and voter are on the same side, so the estimate is independent of any crossing-the-centre norm effects). To estimate the proximity spatial effect, independent from norm effects, we restrict the analysis to respondents with party B on the same side of the ideological spectrum. This allows us to estimate the proximity effect of moving party B one unit on the utility of voting for a candidate from that party excluding any possible normative effects from crossing the centre. We use the following proximity utility function:

We estimate by regressing the likelihood to vote for the candidate on the absolute distance . We use absolute distance, rather than squared distance , as the former allows us to calculate the proximity effect of party B moving from 49.5 to 50.5 independent of the voter’s position:

The estimated effect is a 0.6 percentage-point reduction in the likelihood to vote in the both the British and American samples. This is less than 20% of the magnitude of the effect of the norm effect in Britain and even less in the U.S.. Clearly, the difference between the treatment and control group is not a proximity effect.

Directional voting model: We estimate the effect of the party moving between 49.5 and 50.5 under directional voting. To do so, we use the likelihood to vote for candidates from party A and B, and restrict our analysis to those in the control group that placed themselves between 25 and 75 on the ideological spectrum. For these individuals, parties A and B are always equidistant from the respondent and on the same side of the ideological spectrum. This allows us to estimate the magnitude of the directional effect without contamination from group norms (from crossing the centre) or a proximity model (from an unequal distance between alternatives).

We use the following utility function:

This allows for both the proximity and directional effects. If we restrict the analysis to just those for whom parties A and B are equidistant, we can estimate the directional effect separate from the proximity effect. We do this by calculating the average difference in vote utility (based on likelihood to vote) for candidates from parties A and B:

By design of the experiment , and so,

We empirically know and , so we can get an estimate of . This is the estimated directional effect.

For the British sample:

For the American sample:

Once we have an estimate for , we can calculate the average directional effect (on vote) of party B moving from 49.5 to 50.5.

For the British sample:

For the American sample:

The estimated effect of moving between 49.5 and 50.5 due to directional voting is -0.55 in Britain and -0.62 in the U.S.. This is only 17% and 11% of the observed effects of crossing the centre of the spectrum. Therefore, even if respondents perceive a difference between 49.5 and 50.5 (without being able to compare the two), the resulting directional effect cannot account for the observed effect.

**Supplementary Information 6:** **Conflict by Norm Prime and Strength**

The results presented in the main text of the paper are based on predicted counts (microseconds) from an (accelerated failure time) event history model, using a Weibull distribution that allows the rate at which the respondents finish answering the questions to increase or decrease over time. Table A.3 presents the model estimates used to produce the results presented in Figure 4 in the main text.

Table A.3. Effect of Conflicts, Prime and Strength of Norm on Response Time

|  |  |  |  |
| --- | --- | --- | --- |
|  | # Incongruent | 0.019 | 0.046 |
|  |  | (1.95)\* | (2.73)\*\* |
|  | Prime | -0.21 | 0.17 |
|  |  | (-3.27)\*\* | (1.05) |
|  | Prime X # Incongruent | 0.11 | -0.060 |
|  |  | (7.59)\*\* | (-1.75) |
|  | # Don’t know | 0.062 | 0.066 |
|  |  | (6.41)\*\* | (6.87)\*\* |
|  | Constant | 3.89 | 3.83 |
|  |  | (73.42)\*\* | (51.26)\*\* |
|  | Norm Strength |  | 0.14 |
|  |  |  | (0.91) |
|  | # Incongruent X Norm Strength |  | -0.027 |
|  |  |  | (-1.17) |
|  | Prime X Norm Strength |  | -0.95 |
|  |  |  | (-4.25)\*\* |
|  | Prime X # Incongruent X Norm Strength |  | 0.32 |
|  |  |  | (6.62)\*\* |
|  | ln(P) | 0.15 | 0.18 |
|  |  | (11.85)\*\* | (12.82)\*\* |
| *Schwartz Bayes Information Criterion* | | 4825.806 | 4564.044 |
| *N* |  | 1,988 | 1,881 |

\* *p*<0.05; \*\* *p*<0.01; z-score in parentheses

**Supplementary Information 7: Differences in Research Design (Sniderman and Stiglitz, 2012)**

We describe some of the differences between our research design and that used by Sniderman and Stiglitz (2012) (S&S) to test their reputational premium theory. This is included as a caution to not compare the results too directly. The intent of our design is to build on the categorization theory. While it certainly has implications for S&S’s order-rule, our research is not intended to be a direct test of the implications of the categorization theory for the order-rule.

A key difference between our design and that used by S&S is the ‘vote question’. While we present the position of two parties on an ideological spectrum, and ask the respondent the likelihood of them voting for a candidate from each party (along with asking the norm questions), S&S present the position of two candidates on an issue spectrum and ask which candidate represents the respondent’s position on the issue (p. 40). The question looks something like the following with the position of two candidates indicated on the spectrum (not shown here). In some surveys, these candidates are labelled A and B, and in other surveys they are labelled as Democrat and Republican.

Here are the positions two candidates take on the appropriate level of government services and spending.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Fewer services even in areas such as health and education to reduce spending | 1 | 2 | 3 | 4 | 5 | 6 | 7 | Important for the government to provide many more services even if it means an increase in spending |

Which candidate represents your position on the issues?

Candidate A

Candidate B

neither candidate

Can’t say or don’t know

As described in the main text, we focus on the party that is randomized to either be just on the same side or just on the other side of the centre of the ideological spectrum (party B) – as a robustness check in SI5 demonstrates, our results are replicated when the other party (party A) is not included in the question. Our design allows us to estimate the effect of being on the same or opposite side of the ideological spectrum, and therefore in the same or opposite ideological category/group. S&S test the effects of the Democrat and Republican candidate being in the correct ideological order, controlling for which candidate is closer to the respondent. This allows them to test the order-rule.

S&S do test the importance of the centre of their issue scale, as a test of an alternative hypothesis. They limit their cases to where the Democrat candidate is to the left of the Republican candidate, so that the order-rule is satisfied. They then test the additional effect of the respondent’s co-partisan candidate being on the wrong side, controlling for which candidate is closer. They find no such effect.

There are many differences between our design and the one used by S&S, which is not surprising given that the two designs were intended to test different theories. Most differences have unclear consequences. For example, it’s not clear what the consequence is of the fact that we use a liberal/conservative ideological scale while S&S use a government services issue scale. That said, there are two key differences that we would like to highlight.

1) In our design, the parties are hypothetical, and not given partisan labels as they are by S&S, when they test the potential importance of the centre of the issue scale. S&S make the argument (and empirically test) that even when the parties/candidates are not given partisan labels, survey respondents will apply partisan labels to the hypothetical parties. A robustness check in SI5 demonstrates that when we add the positions of existing parties to the question, making it clear that our hypothetical party B is not one of the existing parties, our results are replicated. As a result, we believe our design removes the party reputation (and therefore reputational premium gained from meeting the order-rule) to test the effect of the position of the party. Therefore, our findings are not in contradiction to the idea of a reputational premium. However, our findings may have an implication for the idea that meeting the order rule is a sufficient condition for the reputational premium. Alternatively, our findings may indicate that the centre of the spectrum might have an effect separate from that of the reputational premium.

2) In our design, we control for distance by minimizing the difference in the spatial position of party B in the two treatment conditions. We do so to the extent that the only way of visually distinguishing the two conditions is with a centreline that reveals whether the party is on the same or opposite side of the ideological spectrum, and therefore in the same or opposite ideological category/group. S&S control for distance by including a 0/1 variable in the regression indicating which party is spatially closest to the respondent. This makes imperfect parametric assumptions about the effect of spatial distance. As a result, we believe that our design provides better control for spatial distance while testing for the effect of a party/candidate being on the same or opposite side of the ideological spectrum.

Again, it is not entirely clear what the consequences are of the differences in design. In the main text, we discuss what we believe may be the applications of our results for the reputational premium theory. However, our design was not intended to be a direct test of the reputational premium and we caution against drawing conclusions about the reputational premium theory from our analysis. Our results do suggest that a project designed to directly test those implications could be fruitful.

**Supplementary Information 8: Candidate Categorization Survey**

From December 13-19, 2022, YouGov conducted a survey of 1,000 Americans on our behalf. The sample was designed to reflect the American population of 18 years of age and older on the following demographic variables: gender, age, race, education, political ideology, geographic region, voter registration. The partisan and ideological identities of the respondents are known from previous surveys. After being asked their ZIP Code, respondents with a partisan identity were asked if they would consider their party’s candidate for the U.S. House of Representatives in their district to be a Liberal or Conservative. For example, a Democrat from Beverly Crest, Los Angeles County would be asked:

Graphical user interface, text, application, email

Description automatically generated

Respondents were subsequently asked the following question regarding the ideological order of the Democratic and Republican parties in Washington:

**Graphical user interface, text, application, email

Description automatically generated**

Sniderman and Stiglitz (2012) (S&S) identified programmatic partisans as those that gave the correct response to the ideological order question and indicated an ideological position consistent with their partisan identity. In our survey, such programmatic partisans represented 47.3 percent of the sample. This is 63 percent of all partisans.[[2]](#footnote-2) Of the programmatic partisans, 73.4 percent categorized their party’s candidate as a Liberal or Conservative (Republicans: 80.8 percent; Democrats: 65 percent). A further 8 percent categorized their candidate as “Neither” and 18.6 percent said they were “Not sure”.

**Supplementary Information References**

Festinger, L. 1957. *A Theory of Cognitive Dissonance*. Stanford: Stanford University Press.

Inglehart, R. and H.D. Klingemann. 1976. “Party Identification, Ideological Preference and the Left-Right Dimension among Western Mass Publics.” In *Party Identification and Beyond: Representations of Voting and Party Competition*, eds. I. Budge, I. Crewe, and D. Farlie. London: John Wiley.

Mason, L. 2018. “Ideologues without Issues: The Polarizing Consequences of Ideological Identities.” *Public Opinion Quarterly* 82(S1):280–301.

Sniderman, P.M. and E.H. Stigliltz. 2012. *Reputational Premium*. Princeton: Princeton University Press.

1. The National Readership survey is a random probability survey comprising 34,000 random face-to-face interviews conducted annually. It is a continuous survey, conducted 12 months of the year, 7 days a week. It has a sample of 36,000 face-to-face interviews a year with British adults aged 15+. The sample is a random probability sample with interviews only conducted at randomly selected addresses with randomly selected individuals. Those interviews are conducted in the respondent's own home and the average interview takes 27 minutes. Respondents are asked about their readership of a list of newspapers, newspaper supplements and magazines, as well as a host of socio-demographic information about themselves. [↑](#footnote-ref-1)
2. This is comparable to S&S, who report that the proportion of partisans that are programmatic is 54%, 60% and 58% based on surveys run in 2002, 2004 and 2008 respectively. [↑](#footnote-ref-2)