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Who follows the leader? Leadership heuristics and valence voting at the UK's 2016 Brexit referendum

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Abstract
Recent accounts of British voting behaviour emphasise the importance of voters' valence judgements on deciding which party to support: significant numbers of voters do not rely on their membership of particular socio-economic groups or ideological preferences; instead, they rely on evaluations of government performance to determine their vote. Part of this evaluation comes from 'fast and frugal' heuristics such as their evaluations of party leaders and other senior politicians. Such heuristics have been shown to be influential in the United Kingdom's 2016 Brexit Referendum for example. We extend this research to show that the influence of leadership heuristics on individuals' chances of voting for Brexit varied depending on evaluations of leading politicians associated with the Remain and the Leave campaigns. Moreover, feelings toward the party leaders had a larger influence on the referendum votes of those holding middle-of-the-road views on Europe than on those who were themselves either strongly pro- or anti-EU.
Keywords
Voting, valence, heuristics, leader cues, EU referendum, England

Introduction

For several decades studies of British voting behaviour focused on differences between socio-economic classes as a key determinant of party support (Butler and Stokes, 1969; Evans and Tilley, 2017; though see e.g. Franklin 1985). An alternative approach – valence politics – shows that class is now relatively unimportant and that voters determine which party to support based on evaluations of past performance and current policy proposals (e.g. Whiteley et al 2013). In making those assessments, however, many use heuristics to guide their voting decisions, among which the cues provided by party leaders and other political figures are important. Although research has shown that this was the case with voting at the 2016 referendum on the UK's continued membership of the European Union (e.g. Clarke et al., 2017; Greene et al, 2018), scholars have not examined how influential those cues were with different types of voters. To this end, we use data from a large survey and extend the methodology used in other studies of the importance of feelings about opinion leaders by uncovering variations among groups of voters in the strength of their influence on the decision whether to vote for Brexit. Cues from three groups of political leaders were

significantly linked to how respondents voted in the referendum across all voters, but they were more important for some voters than others.

Heuristics, feelings about opinion leaders, and voting for Brexit

After decades in which the focus in studies of British voting behaviour was on differences between socio-economic classes in their relative support for the country's main political parties, attention has shifted in the last two decades to an alternative approach. According to valence theories (initiated by Stokes, 1963, in the United States), individual voters evaluate the parties seeking their support in terms of both their past performance and their future promises on the major issues. Voters then select the party which, based on those evaluations, is considered best able to deliver on those issues.

This approach implies that voters undertake calculations based on information that is either provided to them by the parties, particularly during their campaigning, or which they seek out themselves. If voters were to pay close attention to the details of government policy and performance, this would also imply considerable commitment of resources – a task that research suggests few voters are willing or able to undertake (e.g. Achen and Bartels, 2016, 277). Rather than assembling and evaluating large amounts of information in the lead-up to a poll, therefore, scholars – including some who promote the valence approach – argue that voters employ heuristics, or mental short-cuts, which are used to influence their decisions without undertaking the time-consuming effort involved in evaluating their policy positions.[1]

One such favoured heuristic is opinion of the party leaders. Clarke et al. (2009, 18) characterise most voters as 'cognitive misers' who, in order to 'cut the costs of gathering and processing large quantities of complicated and often contradictory information', use partisan attachments and leadership cues to influence their decisions. As Brady and Sniderman (1985) argue, they simply ask themselves whether they like or dislike the various party leaders and other influential individuals, and then choose to follow the direction indicated by those 'safe pairs of hands' (Clarke et al., 2009, 49); elsewhere Whiteley and colleagues (2013, 5) refer to the use of cues from leaders as 'fast and frugal' heuristics.

That approach, incorporating the leader-opinion heuristic, has been applied in studies of voting at the 2016 Referendum on continued UK membership of the European Union. For example, Clarke et al. (2017) show that negative attitudes towards immigration (see also Goodwin and Milazzo, 2017) and feelings regarding lost sovereignty to the EU, linked to those of national identity (Carl et al., 2018), were major contributors to voters' decisions to support Leave rather than Remain. In addition, feelings about the leading individuals in the various campaigns played significant roles – especially those regarding Boris Johnson, one of the leaders of the Leave campaign (Clarke et al., 2017, Chapter 7). But how influential were those feelings, and did their importance for decisions on how to vote at the referendum vary across the electorate?

Clarke et al. (2017), following Hooghe and Marks (2005), suggest that voters' decisions regarding the Brexit referendum were influenced by three sets of factors: (1) calculations – benefit:cost analyses (albeit usually very impressionistic) regarding EU membership; (2) community – feelings of identity, whether to Europe or to Britain/England; and (3) cues – those given by the parties and other interested groups campaigning for and against continued membership, especially their leaders and

[1] A number of studies use survey data to explore patterns of voting at Brexit without incorporating these arguments: see, for example, Alabrese et al. (2018).

main spokespersons.[2] On the first two, many analysts of the referendum outcome, and of trends leading up to that event such as support for the United Kingdom Independence Party (UKIP) at recent local, national and European elections, argue that the people most likely to evaluate EU membership negatively and identify more as British/English were the relatively old, especially male, and those with few educational qualifications (for example, Goodwin and Heath, 2016a, 2016b; Goodwin and Milazzo, 2015). These Leave voters felt alienated from the economic changes associated with globalisation and the impact of immigrants on employment prospects and wage levels in their sectors of the labour market, and also from the lack of responsiveness to their needs by the majority of politicians of all parties who favoured the European project (see Heath, 2018). Thus, a constituency-level analysis of the pattern of voting Leave at the referendum showed strong and substantial negative relationships with the percentage of the local population having degrees and the percentage aged 18-29 (Clarke et al., 2017, 153).

That said, it is likely that valence effects will vary across different groups of voters and in different electoral contexts. Valence evaluations are likely to play a greater part in contests, for instance, where the main parties have converged ideologically than where there are major ideological differences (Green, 2007; Kayser and Wlezien 2011; Vegetti, 2014). The corollary also holds: valence is likely to be a larger influence on vote choice among those voters who do not hold strong ideological or policy preferences than among those who do. While the latter will most likely vote in line with the classic spatial model of electoral choice (opting for the party or decision closest to their ideological or policy preference), the former may be more guided by valence heuristics – who do they think is more or less competent (Kam, 2005). As Green (2007) points out, the issue of Britain's EU membership is interesting in this regard: while the 1990s and 2000s were marked by party convergence on economic and social policies, the country has since become increasingly polarised on attitudes towards the EU. The 2016 Brexit vote therefore provides scope for a test of just how much valence judgements move vote choices: we might expect those with stronger pro- or anti-EU views to be less swayed by general valence heuristics than those whose views on the issue are more moderate.

Three sets of influences are suggested for a model of voting Leave, therefore: (1) the voters' socio-demographic characteristics; (2) their attitudes regarding issues relevant to the referendum – on the economy, on immigration, and on democratic accountability – and their sense of Britishness; and (3) their feelings regarding the leading politicians involved in the campaign – which may have changed during the campaign (Clarke et al., 2017). In terms of causal links, socio-demographic characteristics come first as they cannot be logically predicted by the other two sets. The relative position of the other two in the chain is uncertain, however. Both can be influenced by socio-demographic characteristics – older people may be less likely to identify as European, for example, and those with few qualifications may be more likely to feel that they are not prospering economically. And each set could influence the other in an iterative process: the more that people feel British the more likely they are to feel positively about leaders who promote an anti-EU stance, such as Nigel Farage of UKIP in this context; additionally, the more they felt positively about particular leaders – such as Boris Johnson, who championed the Vote Leave campaign – the more likely they were to vote for the position that person espoused.

Unravelling these interacting influences is the purpose of the present analysis, with the main focus on the impact of feelings about the opinion leaders. How important were feelings about those individuals, and did their impact vary across the electorate – were the cues provided by opinion leaders more important to some voters (those whose attitudes towards the EU were neither strongly pro- or anti-) than others whose strong opinions (based on either calculations or sense of

[2] A related issue, addressed in a pioneering experimental study by Goodwin et al. (2018), is not simply the cues provided by leaders or other campaigners but rather the nature of the messages they present.

community, or both) meant that they did not need such cues before determining how they would vote? In doing so, we follow the research design employed by Clarke et al. (2009, 2017) in their studies of both Brexit and recent general elections, slightly modified to allow for potential confounding effects among groups of independent variables and substantially extended to explore differences in the importance of leader evaluations across the electorate, following the approach developed by Tomz et al. (2003).

Data

To evaluate the relative importance of individual voter characteristics, attitudes and leadership opinions on voting we use the relevant waves (8 and 9) of the 2014-2019 British Election Study internet panel survey of voters, which were conducted immediately before and after the EU Referendum held in June 2016. (Where they were available the attitudinal data were taken from the pre-referendum wave as these may have changed for some individuals following the outcome of the vote.) This gives a sample of some 9600 respondents for whom data were available on all of the chosen variables.[3]

The dependent variable is binary – whether the respondent voted Leave (coded 1) or Remain (coded 0). Respondents who reported that they did not vote – only 4 per cent of the sample (much lower than the actual figure at 28 per cent because, as with many internet and other surveys, it proved difficult to get responses from non-voters) – were excluded from the analyses.[4]

Following the findings of both ecological and individual-level analyses (e.g. Johnston et al., 2018b), we include three independent variables in our models:

- Age – subdivided into seven groups (18-25-year olds serve as the reference category);
- Gender (males serve as the reference category); and
- Educational level – highest qualification attained, divided into six categories (no qualifications serve as the reference category).

We considered a number of other predictors, most notably party identification, which is a common variable in many voting behaviour studies, but we decided not to do so because of collinearity issues. (That rationale is discussed fully in note 5: briefly, we experimented with including party identification, but it made no substantive difference to our findings, so we have not included it in the main analyses presented here.)

For the attitudinal variables, eight were included:

- Economic optimism – a five-point scale ranging from 1 (the economy has been getting a lot worse) through a little worse, staying about the same, a little better, to 5 (getting a lot better);
- Risk of poverty – a five-point scale responding to a question whether respondents thought they would not have enough money from 1 (very unlikely) through unlikely, neither likely nor unlikely, and likely to 5 (very likely);
- Risk of unemployment – a similar five-point scale;
- British identity – a seven-point scale ranging from 1 (feel not at all British) to 7 (feel very strongly British);
- English identity – a similar seven-point scale;
- European identity – a further seven-point scale;

[3] On the data see https://www.britishelectionstudy.com/data/#.XBzOsme7Jow.

[4] As with most recent voter surveys, the BES substantially under-sampled those who did not vote, which was 28 per cent according to the official data (and this was an underestimate since it excluded those who were not registered on the electoral roll.)

- Immigration control – an eleven-point scale ranging from 0 (allow many fewer immigrants) to 10 (allow many more);
- Satisfaction with European democracy – a four-point scale ranging from 1 (very dissatisfied) to 4 (very satisfied).

Three of these measures (economic optimism, and perceived risks of unemployment and poverty) capture one of the most commonly-used valence heuristics – whether voters think the government is delivering economic prosperity. The perceived risks of unemployment and poverty also provide some purchase on the extent to which respondents feel vulnerable to being economically 'left behind' – a factor previous research has suggested to be an important underlying condition behind support for UKIP and for Brexit (e.g. Ford and Goodwin, 2014). Questions of national (and international) identity played very strongly throughout the referendum debate (and were also deeply linked to earlier debates over the UK's relationship with the EU – hence the inclusion of measures of British, English and EU identity). Finally, we include scales on immigration control and on satisfaction with European democracy to capture the main policy issues raised in relation to the Brexit referendum.

Because of collinearity among some of these eight variables, and the possibility of confounding results in regression analyses (Johnston et al., 2018a), these items were reduced to three largely independent but readily interpreted constructs through a principal component factor analysis with oblimin rotation, that accounted for 67 per cent of the common variation in the original eight variables (Table 1). To interpret each component, we focus on the variables with the largest loadings (those with values greater than ±0.6) on each component. This allows the components to be identified as:

1. *Pro-European*: individuals with high positive scores had strong feelings of European identity, favoured more immigration and were satisfied with democracy within the EU;
2. *Economic hardship*: individuals with high positive scores were more fearful of both poverty and unemployment; and
3. *British/English identity*: individuals with high positive scores were more likely to have strong feelings of being both British and English.

The BES survey asked respondents whether they liked or disliked a number of the country's leading politicians, on an eleven-point scale ranging from 0 (strongly dislike) through to 10 (strongly like). Of those we selected seven who were either party leaders or major figures in the EU Referendum campaign: David Cameron, the Prime Minister, and George Osborne, the Chancellor of the Exchequer, who both strongly promoted the Remain campaign; Nigel Farage, the leader of the United Kingdom Independence Party (UKIP) who had campaigned for a referendum on the UK's EU membership for more than two decades; Boris Johnson and Michael Gove – leading Conservatives who fronted much of the Vote Leave campaign; and Jeremy Corbyn and Tim Farron, leaders of the Labour and Liberal Democrat parties respectively, both of whom favoured Remain, although Corbyn did not campaign strongly for that option. Because feelings about the leaders of the Scottish National Party and Plaid Cymru (both of whom campaigned for the UK to remain within the EU) were only asked of respondents in Scotland and Wales respectively, we only analyse data from respondents living in England.

Because there were close correlations between some of these items – those who tended to like Cameron also tended to like Osborne, for example – the seven variables were also subjected to a principal component factor analysis (Table 2). Once again, we interpret each component based on those variables with the strongest loadings. Three readily-interpreted components accounted for 80 per cent of the common variation which, after a direct oblimin rotation, could clearly be identified as:

1. a *Brexiteer* component, with large positive loadings for Farage, Johnson and Gove – those scoring high on the component held relatively positive views of the three politicians most associated with the Brexit campaigns;
2. a *Cameron-Osborne* component – those scoring high on this component thought relatively well of the two best-known figures in the Conservative government, the Prime Minister and the Chancellor (both of whom campaigned for Remain); and
3. a *Corbyn-Farron* component – those with high scores on this component were the most favourably-disposed to the two opposition party leaders.

Model results

Four binary logistic regression models were fitted. The first included the socio-demographic variables only (Table 3). This, as expected, shows that older voters were more likely than their younger counterparts to vote Leave, with very large odds ratios; the odds of voting leave were 3.5 times higher for those aged 65 or over than for those aged 18-25, for example. Females were somewhat less likely to vote Leave than males (an exponent of 0.87); and the higher the respondents' qualifications relative to those with none, the smaller the probability that they voted Leave. (An exponent of 0.13 indicates that the odds of voting leave for those with postgraduate qualifications were under a seventh of the equivalent odds for those with no qualifications.)

Although all of the coefficients in the model are statistically significant, it accounts for only a small amount of the variation in the dependent variable – some 15 per cent according to the two pseudo-R^2 values, compared to over 80 per cent in some of the aggregate analyses (89 per cent in Clarke et al.'s – 2017 – analysis of 632 British Parliamentary constituencies); a clear example of the problems of the ecological fallacy.

The next three models added one or both of the two other sets of independent variables (Table 4). Model II added the three attitudinal components (which are standardised with a mean of 0.0 and a standard deviation of 1.0), and increased the R^2 values substantially (from 0.15 to 0.54 on one of the measures, for example), as well as the percentage of observations correctly predicted (87.7 per cent compared with 51.4 per cent in the null model with no independent variables and 65.9 per cent in that including the socio-demographic variables only). All three attitudinal component variables have highly statistically significant coefficients, with two having odds ratios a considerable distance from 1.0. Those who scored highly on the pro-Europe component were very unlikely to vote Leave, an exponent of 0.05 indicating that a one standard deviation increase in the value of the component score led to an average 95 per cent reduction in the odds of a respondent voting Leave. Complementing that, a coefficient of 0.65, with an odds ratio of 1.92, indicates that on average a one standard deviation increase on the British/English identity component generated a 92 percentage point increase in the odds of voting to leave the EU. Somewhat surprisingly, there is a small negative relationship between the economic prosperity component and voting Leave; the more certain respondents were of increasing poverty and unemployment (other things being equal), the less likely they were to vote Leave.

One further feature of the results of the Model II test compared to that for Model I is the statistical insignificance of many of the relationships between voting and the respondents' socio-demographics, a clear indicator of collinearity, with the different socio-demographic groups apparently – and unsurprisingly – having separate attitudes to Europe, the economy and Britishness. Females were no longer significantly less likely to vote Leave than males, and there were virtually no significant differences by age. The only remaining significant differences were by qualifications: other variables being held constant, those with degrees were less likely than those with no or few qualifications to vote Leave, but the odds ratios showed that those differences were much less

substantial in Model II than in Model I. In sum, socio-demographic components seemed to matter less than attitudinal factors.

Model III (Table 4) removed the attitudinal component variables but added the three components for liking the seven opinion leaders (also standardised with a mean of 0.0 and a standard deviation of 1.0). Like Model II, this substantially increases the explanatory power but, unlike it, does not also see a reduction to insignificance of many of the socio-demographic variables. There are apparent strong links between age and gender, on the one hand, and the three sets of attitudes on the other, but very much weaker ones between age/gender and feelings about leaders.

Those three components representing feelings about the leaders all have strong, and statistically significant, relationships with voting Leave. This is especially so with the first component, with high loadings on liking for Nigel Farage, Boris Johnson and Michael Gove; other variables being held constant, on average the more that respondents liked these three Brexiteers the greater the probability that they would vote Leave – indeed, a one standard deviation increase in the component score was linked to a 22.1 times increase in the probability of a vote to Leave. By contrast, the more that voters liked either Cameron and Osborne (who promoted Remain on behalf of the government) the more likely they were to vote Remain, and the same, though less so, with liking for the leaders of the two opposition parties that took a similar position – Corbyn and Farron. It is very likely that those who were well-disposed to the EU would be more likely to think well of party leaders favouring Remain, while those who did not approve of the EU would favour leaders who argued for Brexit. But. As model IV also controls for respondents' underlying views regarding the EU, there is almost certainly more going on here than a simple correlational coincidence. The correlations between leader evaluations and Brexit vote are very unlikely just to be simple artefacts of a correlation between views on Europe and views on party leaders: *ceteris paribus*, individuals who hold the same view on Europe but different views on the respective groups of party leaders are likely to have voted differently on Brexit. Leader heuristics acted as a separate influence on the Brexit vote, over and above simple associations with pro- or anti-EU feelings.

Model IV (Table 4) included both the attitudinal and the leader feelings components. The goodness-of-fit increased by a small amount over the other two models, suggesting some collinearity among the two sets of variables represented by the components, but all six have statistically significant coefficients – though smaller than in Models II and III respectively, again reflecting some collinearity. The coefficients for the socio-demographic variables again suggest, as in Model II, collinearity between them and the attitudinal variables.[5]

Feelings about leaders matter – but how much, and to whom?

[5] Further modelling showed that adding variables for party identification – whether the respondents identified with one of four parties (Conservative, Labour, Liberal Democrat, UKIP) or none (used as the comparator) – added little to the statistical explanation, largely because of collinearity with the leader feelings variables. Adding the four party identification variables to Model IV did not change the Cox-Snell and Nagelkerke R^2 values. If they are the only four variables included in a model the two R^2 values are only 0.18 and 0.25 respectively, with significant coefficients for each: 0.67 for Conservative, -0.77 for Labour, -1.37 for Liberal Democrat, and 4.40 for UKIP. When those four variables are added to Model IV the coefficients are -0.35 (insignificant), -0.45, -0.35 and 0.69 respectively, indicative of substantial collinearity with the other variables. Further the coefficients for the leadership components hardly change: from 2.31 to 2.27 for the Brexiteer component; from -1.04 to -1.03 for the Cameron-Osborne component; and from -0.25 to -0.22 for the Corbyn-Farron component.

The results of this modelling clearly indicate – in line with other findings using such variables – that *respondents' feelings about opinion leaders are strong predictors of how people voted*. But how much difference did these feelings make? Most studies using binary logistic regressions to predict voting behaviour simply report and interpret the regression coefficients, which indicate an average impact across the sampled respondents (as in Clarke et al.'s – 2017, 170ff – analysis of the impact of feelings about Boris Johnson in the Brexit vote). There may be considerable variation about that average, however; leadership feelings may have much more influence on some groups of voters than on others.

To explore whether that was the case with voting for Brexit, we extend the modelling output by applying its results to different groups within the population (as in Johnston et al., 2004). The coefficients reported in Table 4 are all partial, each of them indicating the impact of the specified variable when that of all others has been held constant. If those other variables predict most of the variation in the voting behaviour of any specific group – i.e. whether they all were very likely to have voted either Leave or Remain – then although the further variable may be statistically significant it can only make a small additional contribution to the model's predictive power for that group. To what extent was that the case in predicting voting at the 2016 referendum: in particular, did feelings about leaders have a more substantial impact on some groups' decisions relative to others'?

Model II in Table 4 accounts for some 54 to 72 per cent of the variation in the pattern of voting Leave (depending on which R^2 value is preferred) and successfully predicts nearly 88 per cent of the values on the dependent variable. Addition of the feelings variables in Model IV only increases that percentage by about four points, although the two R^2 values each increase by about ten points. Given that much of the variation in the dependent variable is taken up by the independent variables included in Model II, therefore, it may be that the impact of the feelings about leaders variables – although significant and apparently substantial – applies only to a small proportion of the variation that is left unaccounted for by the other variables. (If, for example, the other variables accounted for 80 per cent of the variation, then the impact of feelings about leaders would only impact on the remaining 20 per cent.) Furthermore, with some voters their decision may already have been firm based on the attitudinal variables alone, in which case how they felt about the leaders would be irrelevant; others may be less certain, however, and strong feelings about some of the leaders could then be a substantial influence on their final decision.

To explore these possible differences we looked at four 'hypothetical' voters, chosen to differentiate among those with particular socio-demographic characteristics linked to opinions about Brexit and among those with different attitudes regarding Europe, economic hardship and British identity:

> **A**: A female voter, aged 36-45, with A-levels as her highest qualification, with scores of +1.0 (i.e. 34 per cent above the average) on all three of the attitudinal variables (i.e. relatively pro-Europe, somewhat fearful of poverty and unemployment, and feeling strongly British).
> **B**: A male voter, aged 18-25, with no qualifications and scores on all three attitudinal variables set at 0.0 (i.e. middle-of-the-road);
> **C**: A female voter, aged 65+, also with no qualifications, with scores of -2 on the first attitudinal variable, +2 on the second and +2 on the third (i.e. very anti-Europe, forecasting economic hardship, and very British/English).
> **D**: A male voter, aged 18-25 with a postgraduate degree, and scores of +2 on the first attitude, -2 on the second and -2 also on the third (i.e. very pro-Europe, not expecting economic hardship and not strongly British/English).

Voters **A** and **B** represent those whose characteristics and attitudes suggest they may not have strong feelings either way about Brexit and who thus may have been strongly influenced by their feelings about the various leaders in how they voted; voters **C** and **D** have characteristics and attitudes likely to be linked with stronger opinions regarding Brexit, for whom feelings about the

leaders may have been much less important in their decision-making when voting at the referendum.

For each of the four hypothetical voters, we calculated the probability of voting Leave at each standard deviation around the mean (e.g. -3, -2, -1, 0, +1, +2 and +3, respectively) for each of the three leadership feelings components.[6] The trajectories of those predicted probabilities are shown in Figures 1-4. The vertical axis on these graphs is the predicted probability of voting Leave and the horizontal axis refers to the percentage of respondents with scores on the feelings components from -3 through 0 to +3. Since the great majority of respondents (assuming a normal curve) will have scores between +1 and -1 standard deviations around the mean (i.e. encompassing 68.6 per cent of all respondents) this method of presentation emphasises those over the more extreme, and rarer, values: those with values either less than -2sd or more than +2sd. Thus in Figure 1, for example, the line for the Brexiteers component shows that somebody with the characteristics of Hypothetical Voter **A** whose score for that component was -1 (i.e. did not like Farage, Johnson and Gove very much) had a predicted probability of voting Leave of just over 0.0, whereas one with similar characteristics but a score of +2 (i.e. liked those three leaders) had a probability of 0.95. For such female, middle-aged voters who strongly identified as British/English, therefore, their feelings about those three Brexiteer leaders were highly influential on their decision how to vote at the referendum.

Compared to that difference, the two other lines on the graph for Typical Voter **A** show much less variation in its central part. For feelings about Cameron and Osborne, the difference in the propensity to vote Leave varied in the central part of the graph from 0.33 among those who did not like Cameron and Osborne very much to 0.06 for those who did. (There was however a much steeper decline among the minority at the extreme – between a score of -3 and -1 the probability of voting Leave more than halved from 0.79 to 0.33.) And the difference according to their liking for Corbyn and Farron was even less.

Hypothetical Voter **B** is a middle-of-the-road male, for whom Figure 2 shows major shifts in the probability of voting Leave according to feelings about the leaders. As liking for the Brexiteers increased, so too did the probability of a Leave vote, from 0.13 to 0.94 in the central portion of the graph, whereas as liking for Cameron and Osborne decreased it declined substantially, from 0.80 to 0.34. In this case, too, the degree to which respondents liked Corbyn and Farron also has a substantial independent impact, the probability changing from 0.65 to 0.53.

With these two hypothetical and relatively middle-of-the-road, voters, therefore, feelings about the leaders – especially the three Brexiteers and, to a lesser extent, the then Prime Minister and Chancellor of the Exchequer – were clearly influential on whether they voted Leave. But how about the other two types, who had much stronger positions on the three attitudinal components? Typical Voter **C** was very likely to vote Leave according to her socio-demographic characteristics and attitudes. For her, as Figure 3 shows, in most cases whether the various leaders were liked or disliked was largely irrelevant: she would vote Leave whatever she thought about any of them. The only exception to this was for those who, despite being pro-Leave in general, did not like the three Brexiteers very much; for them – to the left of the graph with scores of -1sd or less – the more they liked the Brexiteers the more likely they were to vote Leave (a probability of 0.14 for those with a score of -3, 0.62 for a score of -2, and 0.94 for a score of -1.)

Finally, Hypothetical Voter **D** was very unlikely to vote Leave according to his socio-demographic characteristics and attitudes and this is clearly shown by the flat and close to zero probabilities in the

[6] This was achieved using a bespoke routine in Excel; Tomz et al. (2003) have provided Stata macros for the CLARIFY procedure at https://gking.harvard.edu/clarify.

three trajectories in Figure 4. There is again an exception, however: despite their general pro-EU attitudes, these individuals were quite likely to vote Leave if they had very strong positive feelings about the three Brexiteers. Among voters to the far right of the graph, very strong liking for Farage, Johnson and Gove over-rode their predispositions; those with a score of +1 had a probability of voting Leave of only 0.07, but it increased to 0.45 for those with a score of +2, and to 0.89 for those at the extreme of the distribution with a score of +3.

Partial multiple regression coefficients indicate the average impact of independent variables on the dependent variables across all observations, but there can be substantial variation around that average: some individual respondents may be more influenced by an independent variable than others. By applying the model outcomes to particular groups of respondents, chosen to represent those with different characteristics and attitudes, this extension to the normal modelling output provides additional information about the relative influence of the variables of particular interest – in this case, feelings about opinion leaders; those feelings mattered much more as influences on some voters' decisions than they did on others'.

Conclusions

A growing body of research suggests that in deciding how to vote, many individuals are strongly influenced by their feelings about the main opinion leaders at the relevant contest – especially the party leaders. These conclusions are drawn from analyses of the type presented here in Table 4, which show the average condition, when all other variables in the model are held constant. Thus the general conclusion to be drawn from such analyses of the referendum on the UK's membership of the European Union would be that favourable feelings toward the three Brexiteers was strongly linked to a decision to vote Leave, whereas a liking for Cameron and Osborne, and to a lesser extent Corbyn and Farron, was linked to a decision to vote Remain.

But was there variation around that average: how substantial were the differences in those feelings in their influence on the voting outcome? That question cannot be answered using the standard output from a regression model, which portrays the average situation only. We have used a method of applying the regression model equations to predict how different types of voters were influenced by their feelings towards the leaders, relative to their attitudes on other aspects of the issue. Among those whose attitudes and characteristics meant that they were almost certain to vote either Leave or Remain at the Brexit referendum feelings about the leaders were largely uninfluential – their vote was determined without taking that extra information into account. Among those whose position on the vote was less determined by other factors, on the other hand, their feelings about the leaders were crucial; in particular those who strongly liked the three Brexiteer leaders – Nigel Farage, Michael Gove and Boris Johnson – were much more likely to vote Leave than those who did not.

Unravelling cause-and-effect is often not straightforward in modelling voting decisions that are influenced by a range of interacting factors, and analytical strategies are needed to tease out the crucial relationships. As illustrated here, this means avoiding issues of collinearity and confounding wherever possible – as also does avoiding the ecological fallacy.

In their work on Brexit, Clarke et al. (2017) suggested important roles for calculation, community and cues as determinants of how people voted at the 2016 referendum, and their analytical results suggested that all three were relevant. This note has extended those findings, using a methodology that can be applied in a wide range of other contexts. Given calculations about the benefits and costs of the EU project and feelings of community identity, cues provided by opinion leaders are important – but to some voters only. For those voters – who might otherwise be undecided

according to their calculations and community identities – those cues can be very important indeed, changing the probability of whether they vote for or against a proposition very substantially.

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Table 1. Principal components factor analysis, with oblimin rotation, of the eight attitudinal variables: component loadings (substantial loadings in bold).

Component	1	2	3
Economic Optimism	-0.56	-0.20	0.25
Risk of Poverty	0.03	**0.87**	-0.20
Risk of Unemployment	0.11	**0.84**	-0.08
British Identity	0.01	-0.08	**0.90**
English Identity	-0.43	-0.03	**0.69**
European identity	**0.85**	-0.02	0.03
Immigration control	**0.79**	0.02	-0.25
Satisfaction EU democracy	**0.74**	0.09	-0.03

Table 2. Principal components factor analysis, with oblimin rotation, of liking variables for the seven opinion leaders: component loadings (substantial loadings in bold).

Component	1	2	3
Like/Dislike Farage	**0.90**	0.05	-0.29
Like/Dislike Johnson	**0.91**	0.28	-0.32
Like/Dislike Gove	**0.87**	0.30	-0.32
Like/Dislike Cameron	0.28	**0.91**	0.06
Like/Dislike Osborne	0.19	**0.89**	0.09
Like/Dislike Corbyn	-0.38	-0.38	**0.78**
Like/Dislike Farron	-0.25	0.35	**0.79**

Table 3. Binary logistic regression of vote Leave on the socio-demographic variables. (Significant coefficients at the 0.05 level or better are shown in bold.)

	b	se	exp
Constant	0.04	0.03	1.04
Age group (comparator 18-25)			
26-35	**0.79**	**0.13**	**2.21**
36-45	**0.92**	**0.11**	**2.52**
46-55	**1.18**	**0.10**	**3.26**
56-65	**1.28**	**0.10**	**3.60**
66+	**1.27**	**0.10**	**3.54**
Gender (comparator: Male)			
Female	**-0.14**	**0.04**	**0.87**
Education level (comparator: None)			
GCSE D-G	**-0.29**	**0.13**	**0.75**
GCSE A-C	**-0.37**	**0.10**	**0.69**
A-level	**-0.83**	**0.09**	**0.44**
Undergraduate	**-1.51**	**0.09**	**0.22**
Postgraduate	**-2.06**	**0.11**	**0.13**
N	11,357		
R^2 Cox-Snell	0.13		
R^2 Nagelkerke	0.17		
% correct (Null: 51.4)	65.9		

Table 4. Binary logistic regressions of vote Leave. (The figures in brackets show the standard error and odds ratio associated with the regression coefficient shown before the bracket: significant coefficients at the 0.05 level or better are shown in bold.)

Model	II	III	IV
Constant	**1.84 (0.24: 6.30)**	**0.42 (0.05: 1.53)**	0.37 **(0.06: 1.44)**
Age group (comparator 18-25)			
26-35	**0.38 (0.18: 1.46)**	**0.72 (0.18: 2.06)**	**0.51 (0.21: 1.67)**
36-45	0.19 (0.17: 1.21)	**0.63 (0.18: 1.87)**	0.29 (0.20: 1.34)
46-55	0.22 (0.16: 1.24)	**0.81 (0.17: 2.25)**	0.35 (0.19: 1.42)
56-65	0.04 (0.16: 1.04)	**0.76 (0.16: 2.13)**	0.13 (0.19: 1.14)
66+	-0.09 (0.17: 0.91)	**0.69 (0.17: 1.99)**	0.03 (0.20: 1.03)
Gender (comparator: Male)			
Female	-0.06 (0.07: 0.95)	**0.21 (0.07: 1.24)**	**0.16 (0.08: 1.18)**
Education level (comparator: None)			
GCSE D-G	-0.20 (0.19: 0.82)	-0.37 (0.20: 0.69)	-0.39 (0.23: 0.68)
GCSE A-C	-0.15 (0.15: 0.86)	**-0.39 (0.16: 0.68)**	-0.23 (0.18: 0.79)
A-level	**-0.31 (0.15: 0.74)**	**-0.72 (0.16: 0.49)**	**-0.42 (0.18: 0.66)**
Undergraduate	**-0.54 (0.14: 0.59)**	**-0.97 (0.15: 0.38)**	**-0.50 (0.17: 0.61)**
Postgraduate	**-0.71 (0.17: 0.49)**	**-1.37 (0.18: 0.26)**	**-0.67 (0.21: 0.51)**
Pro-Europe	**-2.97 (0.06: 0.05)**	-	**-2.04 (0.07: 0.13)**
Economic hardship	**-0.20 (0.04: 0.82)**	-	**-0.13 (0.04: 0.88)**
British/English identity	**0.65 (0.04: 1.92)**		**0.36 (0.05: 1.44)**
Brexiteer component	-	**3.10 (0.07: 22.1)**	**2.31 (0.07: 10.9)**
Cameron-Osborne component	-	**-1.20 (0.05: 0.30)**	**-1.04 (0.05: 0.35)**
Corbyn-Farron component	-	**-0.76 (0.04: 0.47)**	**-0.25 (0.05: 0.78)**
N	9,620	9,620	9,620
R^2 Cox-Snell	0.54	0.57	0.62
R^2 Nagelkerke	0.72	0.75	0.82
% correct (Null: 51.4)	87.7	88.9	91.6

Figure 1. Estimated probabilities of voting Leave by Hypothetical Voter A

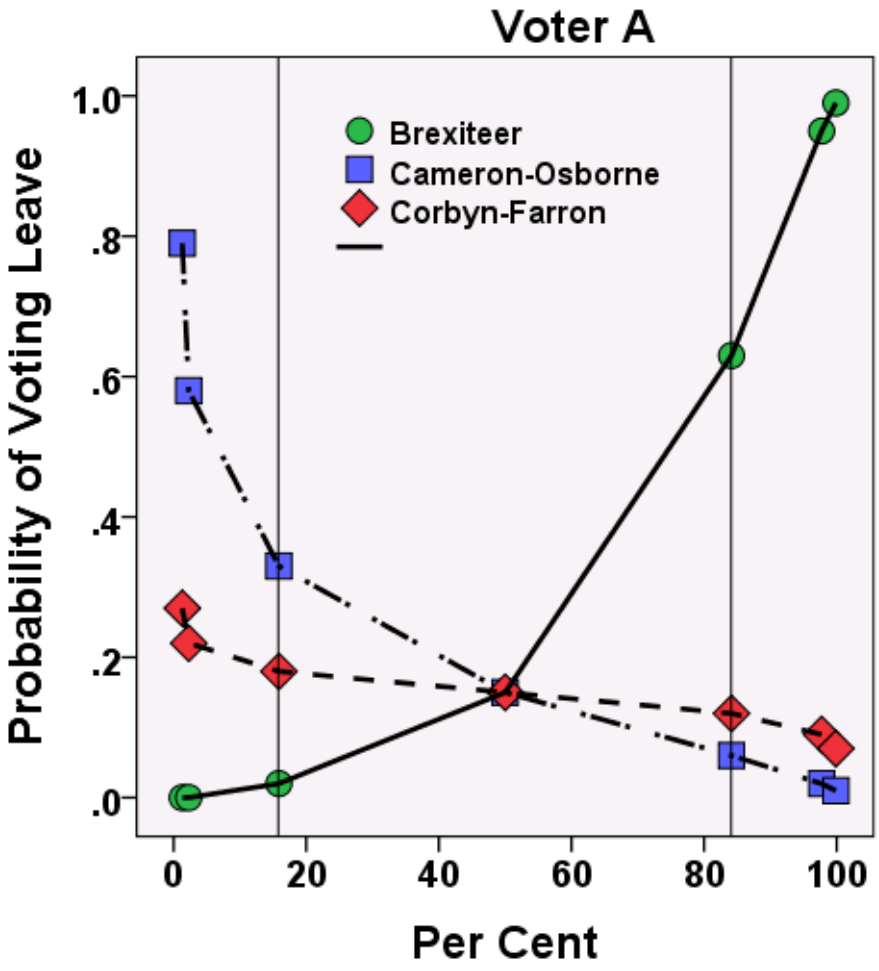

Figure 2. Estimated probabilities of voting Leave by Hypothetical Voter B

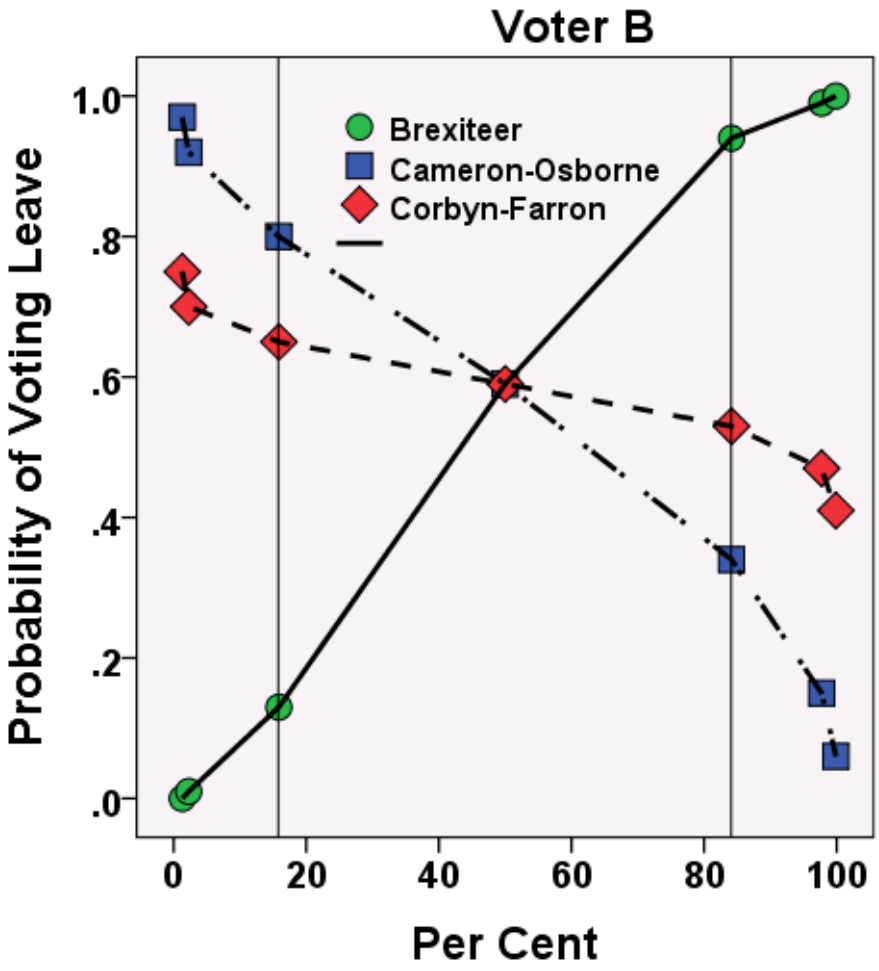

Figure 3. Estimated probabilities of voting Leave by Hypothetical Voter C

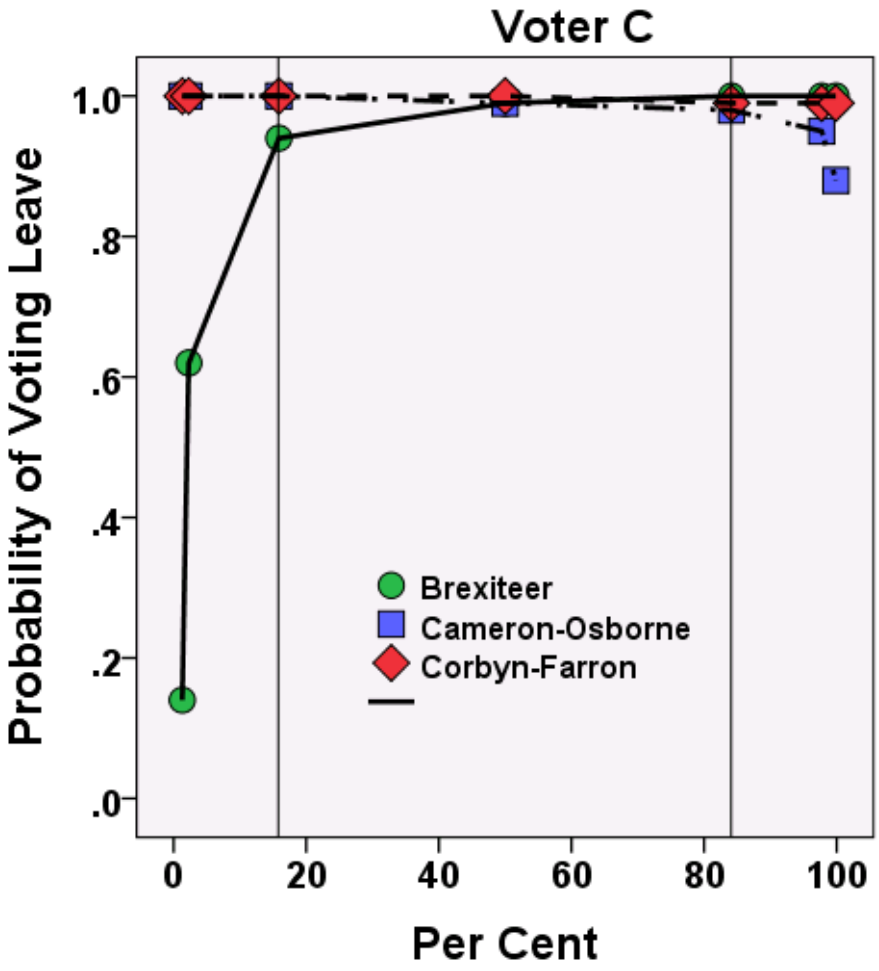

Figure 4. Estimated probabilities of voting Leave by Hypothetical Voter D