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To cite this article: Domantas Undzenas, Kris Dunn & Viktoria Spaiser (2022) Re-examining the EU Referendum vote: right-wing authoritarianism and social dominance orientation as indirect trait-level motivation, *Journal of Elections, Public Opinion and Parties*, 32:4, 938-959, DOI: [10.1080/17457289.2021.1986052](https://doi.org/10.1080/17457289.2021.1986052)

To link to this article: <https://doi.org/10.1080/17457289.2021.1986052>



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Published online: 11 Oct 2021.



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Re-examining the EU Referendum vote: right-wing authoritarianism and social dominance orientation as indirect trait-level motivation

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ABSTRACT

Various economic and social characteristics have been used to explain individual vote choice in the 2016 British EU Referendum. Recently, researchers have considered the role various psychological orientations have played in this vote choice. Here, we are interested in two in particular: right-wing authoritarianism (RWA) and social dominance orientation (SDO); constructs that are often used to predict a host of political attitudes and behaviors, particularly those where group identities are a central issue. Those high in RWA prefer group uniformity and are willing to use coercion to enforce this preference. Those high in SDO prefer group-based, hierarchical social and political systems over more egalitarian systems. These orientations are therefore likely to have played a role in people's vote choice in this referendum. Using data from the 2014–2019 British Election Study internet panel we show that RWA and SDO powerfully influence anti-immigrant attitudes and pro-sovereignty attitudes; attitudes strongly associated with individual vote choice. Our findings suggest that the EU Referendum effectively rallied people's prejudices against foreign and domestic outsiders to pull the United Kingdom from the European Union.

ARTICLE HISTORY Received 8 September 2020; Accepted 9 August 2021

Introduction

On 23 June 2016, the British electorate voted to leave the European Union. Key issues during the referendum campaign included immigration, the economy, and British national sovereignty (Curtice 2016). Analysis of the remain and leave campaigns and voters indicate that those who voted to leave the EU were much more likely than their remain-voting counterparts to emphasize xenophobic attitudes towards immigrants and the need to

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curtail immigration into the United Kingdom (Hobolt 2016). Given this and similar findings (e.g. Abrams and Travaglino 2018; Clarke, Goodwin, and Whiteley 2017b; Goodwin and Milazzo 2017; Hutchings and Sullivan 2019), political and social psychologists have begun to look at how the Brexit vote is related to concepts such as Right-wing Authoritarianism (RWA) and Social Dominance Orientation (SDO). Those higher in right-wing authoritarianism favor ingroup unity and uniformity and are punitive toward those who violate their conceptions of what constitutes normative thought and behavior (Altemeyer 1996). Those higher in social dominance orientation favor a clear and unchallenged group hierarchy (Pratto et al. 1994). Immigration of foreign others and the division of political power between British and foreign institutions are the opposite of the preferences of those high in these two traits. Previous research suggests that persons who scored higher on these scales were more likely to hold anti-immigrant attitudes and therefore were more likely to vote to leave the EU (Golec de Zavala, Guerra, and Simão 2017). This article picks up where this earlier research leaves off.

Using representative data from the 2019 British Election Study, we extend the work of Golec de Zavala, Guerra, and Simão (2017) in two ways. First, we add an additional consideration into the story these authors tell about the EU Referendum vote. Golec de Zavala, Guerra, and Simão (2017) focus on attitudes towards immigrants as the primary variable that connects RWA and SDO to vote choice. Given the “Take back control” campaign motto of the Leave campaign, we also include attitudes toward British sovereignty as another potential pathway through which RWA and SDO could influence vote choice. Second, we examine whether RWA and SDO work additively in predicting anti-immigrant and pro-sovereignty attitudes or whether scoring highly in only one of these traits is enough to motivate these attitudes. This latter consideration is more telling about who chooses to remain than who chooses to leave. Such a compensatory relationship suggests that one must be low in both RWA and SDO to score low enough on both anti-immigrant and pro-sovereignty attitudes to motivate a remain vote. Our analyses suggest that right-wing authoritarianism and social dominance orientation work together in different ways to create anti-immigrant and pro-sovereignty attitudes and that these attitudes motivate one’s vote choice in the EU Referendum. In sum, low scores on both RWA and SDO are likely to combine to create attitudes that motivate a remain vote while high scores in either RWA and SDO are likely to create a combination of attitudes that motivate a leave vote.

RWA, SDO, and motivations for voting to leave the EU

An increasing volume of research is documenting the motivations underlying vote choice in the British EU Referendum. Curtice (2016) shows that the Leave

campaign advocated decreasing immigration into the UK as well as emphasizing the need for Britain to “regain” its national sovereignty in order to exert control over its borders and its future. For the Remain campaign, the main issue was the economy: fear that an exit from the European Union would have a catastrophic impact on the country’s economy and financial status.

The Leave campaign’s focus on curbing immigration and regaining national self-determination raises the spectre of theories of authoritarianism and social dominance as possible causal explanations for peoples’ vote choice. Those high in right-wing authoritarianism are interested in maintaining, promoting, or returning to a uniform and unified society under the strict control of ingroup authority (Altemeyer 1996; Duckitt 1989). The continued arrival of immigrants, who may not look or think like the British, is perceived by those higher in RWA to threaten social cohesion. Those high in RWA are also sensitive to the origins of leadership; being particularly concerned that leadership is prototypical of their ingroup. The primacy of EU law over British law (Avbelj 2011) is perceived as a direct threat to the wellbeing of the ingroup among those British higher in RWA. Those higher in this trait are therefore more in favor of curbing immigration and returning sole political authority to British hands. Any policy that promotes these ends, including removing the UK from the EU, will likely receive greater support from those higher in RWA.

Parallel to RWA, social dominance orientation is also directly concerned with intergroup relations. SDO focuses on maintaining the hierarchical dominance of the dominant group over potential opposition groups (Sibley and Liu 2010). The Leave campaign’s focus on and appeal to anti-immigrant attitudes and a “return” of British sovereignty may, then, also be explained by reference to social dominance orientation. Those who score highly on this trait view group competition as zero-sum and therefore favor maintaining hierarchical control over society and perceive threat from any groups who may compete for ingroup resources (Cohrs and Asbrock 2009; Costello and Hodson 2011). British high SDO’s are likely to see immigrants as competition for what they perceive to be limited resources; resources such as jobs, housing, access to the National Health Service (NHS), and school positions for their children. Immigration of foreign nationals combined with political decisions being made from outside the ingroup, by members of those immigrant groups that are competing for national resources, threatens the established hierarchy and hegemony of the British ingroup.

This dual pathway to prejudice and intolerance is formalized in the dual-process model of prejudice (Duckitt 2001; Duckitt and Sibley 2009). Research examining this model demonstrates that values (Cohrs et al. 2005) and world-views (Perry, Sibley, and Duckitt 2013) work through these two traits to predict various outcomes related to the expression of prejudice and intolerance; including voting behavior. Research indicates that persons high in both

RWA and SDO, “double-highs”, are more prejudiced than those who score low on both scales or high on one and low on the other (Altemeyer 1996, 2004) and as such it seems that there exists an additive effect between the two scales (Sibley, Robertson, and Wilson 2006). However, Wilson and Sibley (2013) find evidence of interactive effects between these two traits when predicting political liberalism/conservatism. Specifically, these authors find that in order to be very liberal, one has to be low in both scales; whereas to be very conservative, one needs only score highly on a single scale. The argument being that liberal attitudes are associated with neither competitive nor dangerous worldviews while conservative attitudes can be motivated by either or both (Duckitt 2001). In other words, a lack in either trait can be compensated for by the presence of the other.

Consistent with an additive interpretation of the dual-process model, Golec de Zavala, Guerra, and Simão (2017) find that both SDO and RWA, via perceived threat from immigrants, predict an increase in the likelihood of a Leave vote in the Brexit referendum; suggesting that prejudice towards immigrants, whether from a threat to ingroup norms (RWA), resource competition (SDO), or both, was a driving factor that led some British voters to cast their support for the Leave campaign. However, these authors do not examine whether there is an interaction between these two traits in the pathway that leads to a Leave vote.

We expect that those attitudes that predict a Remain vote (anti-immigrant and pro-sovereignty attitudes) will stem from lower scores on both RWA and SDO as these attitudes suggest lower perceived threat from outgroups and acceptance (or at least forbearance) of non-ingroup influence over economic, social, and political decisions. Higher scores on either RWA or SDO, on the other hand, are capable of motivating a leave vote through an objection to outgroup presence and outgroup interference in ingroup affairs. A higher score on either RWA or SDO will therefore indirectly predict a higher likelihood of reporting a leave vote through their impact on anti-immigrant and pro-sovereignty attitudes. We therefore propose the following set of hypotheses:

H1a: RWA will positively predict pro-sovereignty attitudes.

H1b: SDO will positively predict pro-sovereignty attitudes.

H2: There will be a negative interaction between SDO and RWA in predicting pro-sovereignty attitudes.

H2a: The joint impact of a high score in SDO and a high score in RWA will predict similar pro-sovereignty attitudes than they would independently.

H2b: The joint impact of a low score in SDO and a low score in RWA will predict lower pro-sovereignty attitudes than they would independently.

H3a: RWA will positively predict anti-immigrant attitudes.

H3b: SDO will positively predict anti-immigrant attitudes.

H4: There will be a negative interaction between SDO and RWA in predicting anti-immigrant attitudes.

H4a: The joint impact of a high score in SDO and high score in RWA will predict similar anti-immigrant attitudes than they would independently.

H4b: The joint impact of a low score in SDO and low score in RWA will predict lower anti-immigrant attitudes than they would independently.

H5a: Anti-immigrant attitudes will predict vote choice.

H5b: Pro-sovereignty attitudes will predict vote choice

H6a: Anti-immigrant attitudes will mediate the conditional effect of SDO and RWA on vote choice

H6b: Pro-sovereignty attitudes will mediate the conditional effect of SDO and RWA on vote choice

Hypotheses H2, H2a, and H2b and H4, H4a, and H4b suggest a negative interaction between RWA and SDO when predicting both sets of attitudes. When RWA is low, the impact (i.e. the coefficient) of SDO on the attitudes measures will be relatively high. As RWA increases, the impact of SDO will decrease as RWA and SDO provide similar, overlapping, motivations for these attitudes. Similarly, when SDO is low, the impact of RWA on these attitudes will be relatively high but will decrease as SDO increases. Both patterns indicate that as the value of one trait increases the impact of the other trait on these attitudes will decrease.

Figure 1 illustrates our model. Note that even though we consider both the effect of SDO to be conditional on RWA and the effect RWA to be conditional on SDO, for the sake of this illustration we assign SDO as the moderating variable.

Data

The data for the following analyses are derived from the Wave 15 datafile of the 2014–2019 British Election Study Internet Panel (Fieldhouse et al. 2019)

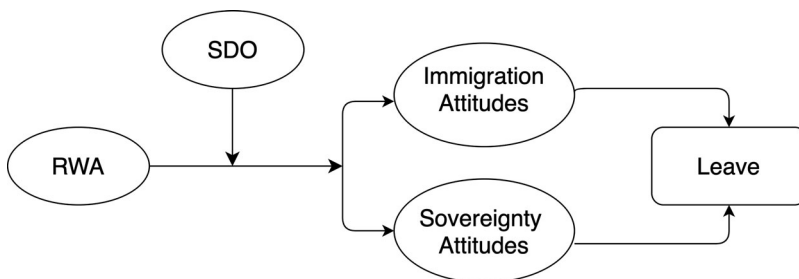


Figure 1. Visual representation of theorized mediated moderation model.

and consists of 2,771 respondents who were entitled to vote in the EU referendum on June 23rd, 2016 (i.e. British or Irish respondents), who did vote in the Referendum, and who could recall (and would volunteer) their vote choice. The EU Referendum vote choice question was initially asked in Wave 9 (June-July 2016) immediately following the EU Referendum; panellists added after Wave 9 were asked to recall their vote choice on their addition to the panel (between Waves 10 (November-December 2016) and 15 (March 2019)). The RWA-relevant items (see below) are derived from questions asked in Wave 14 (May 2018). The immigrant-attitudes, sovereignty-attitudes, and SDO-relevant questions were asked in Wave 15 (March 2019). All demographic controls are from Wave 15 or earlier. All waves of the panel study were conducted via an online survey administered by YouGov. Observations with missing values were deleted listwise. This results in a sample size of 2,771 respondents. Because of the need for respondents that participated in multiple waves of this panel survey and the presence of missing data, this sample should not be considered representative of the British public.

Measurement

EU Referendum vote

Our dependent variable is the respondent's recollection of their vote choice in the EU Referendum. Following on from a question inquiring into whether the respondent managed to vote in the EU Referendum, the respondent was asked: "Which way did you vote in the EU referendum?"

Those who responded "Remain in the EU" were coded 0. Those who responded "Leave the EU" were coded 1. Those who responded "Don't know" or who did not vote were not included in the analyses. 47.89% of this sample reported a remain vote while 52.11% reported a leave vote.

Anti-immigrant attitudes

The anti-immigrant attitudes scale is comprised of two questions, one aiming to address economic issues and the other cultural issues. The question for the former reads: "Do you think immigration is good or bad for Britain's economy?" The question for the latter reads: "And do you think that immigration undermines or enriches Britain's cultural life?"

Both items load onto a single factor and produce a Cronbach's alpha of 0.872. The two items are averaged and recoded to range from 0 to 1, with higher values indicating a more negative view of immigrants. The sample mean for this scale is 0.431 with a standard deviation of 0.298.

Pro-sovereignty attitudes

The pro-sovereignty attitudes scale is derived from three questions inquiring into how important three items are when considering the exit deal with the EU. The question is prefaced with the following text: "How would you rate the importance of these different aspects of a deal to leave the European Union?" The three sovereignty-relevant options are: "Allowing Britain to make its own trade deals with other countries", "Not having to follow rules and regulations set by the EU", and "Allowing Britain to control immigration from the EU". These three items load onto a single factor and produce a Cronbach's alpha of 0.852. The three items are averaged and rescaled to range from 0 to 1, with a higher value indicating a higher level of importance attributed to issues of UK sovereignty in the exit deal. The mean for the scale is 0.693 with a standard deviation of 0.268.

Right-wing authoritarianism

Right-wing authoritarianism was originally conceptualized and operationalized by Altemeyer (1981). The aim of his RWA scale was to determine respondents' likelihood to:

1. submit to the established and legitimate authorities of their societies,
2. believe that *everyone* should adhere to the norms and customs that their recognized authorities have established, and
3. sanction aggressive action against those who deviate from group norms.

The RWA scale has proven to be a valid and replicable tool in predicting a host of prejudice-related social and political attitudes. Over time, various incarnations of the RWA scale have been designed (e.g. Duckitt et al. 2010; Dunwoody and Funke 2016) all focusing on these three essential criteria: authoritarian submission, conventionalism, and authoritarian aggression. In the BES, the measure of right-wing authoritarianism is composed of five attitudinal items measured by reference to a 5-point agree/disagree Likert scale with 1 coded as "Strongly disagree" and 5 coded as "Strongly agree":

1. Young people today don't have enough respect for traditional British values
2. For some crimes, the death penalty is the most appropriate sentence
3. Schools should teach children to obey authority
4. Censorship of films and magazines is necessary to uphold moral standards
5. People who break the law should be given stiffer sentences

Though this scale has changed over time (Tilley 2005) the various incarnations have been reliable indicators of authoritarianism in the British public (e.g. Evans, Heath, and Lalljee 1996; Evans and Heath 1995; Ford 2006; Heath, Evans, and Martin 1994). Importantly, the scale is face-valid when compared with items from Altemeyer's (1996) considerably lengthier item battery and has items representing each of the three component facets of this measure: authoritarian submission (item 3), conventionalism (items 1 and 4), and authoritarian aggression (items 2 and 5).

All five items load onto a single factor in an exploratory factor analysis and produce a Cronbach's alpha of 0.803. All five items are averaged to produce the right-wing authoritarianism scale. The scale is recoded to range from 0 to 1, with higher scores indicating a higher level of right-wing authoritarianism. In this sample, RWA has a mean of 0.651 and a standard deviation of 0.224.

Social dominance orientation

Based in Social Dominance Theory, the SDO scale is designed to measure respondents' belief that arbitrary group-based hierarchies (e.g. patriarchal, white supremacist, classist) should be promoted and/or maintained and are preferable to a more egalitarian society (Pratto et al. 1994). As with RWA, there are multiple measurement scales for SDO. The SDO_{7(S)} scale (Ho et al. 2015) is used to measure SDO in this data. The eight items used to compose this scale are:

1. An ideal society requires some groups to be on top and others to be on the bottom
2. Some groups of people are simply inferior to other groups
3. No one group should dominate in society (reverse scored)
4. Groups at the bottom are just as deserving as groups at the top (reverse scored)
5. Group equality should not be our primary goal
6. It is unjust to try to make groups equal
7. We should do what we can to equalize conditions for different groups (reverse scored)
8. We should work to give all groups and equal chance to succeed (reverse scored)

All eight items load on a single factor in an exploratory factor analysis and produce a Cronbach's alpha of 0.840. All eight items are averaged and the result rescaled to range from 0 to 1. A higher score indicates a higher level of social dominance orientation. The mean for the scale in this sample is 0.340 with a standard deviation of 0.184.

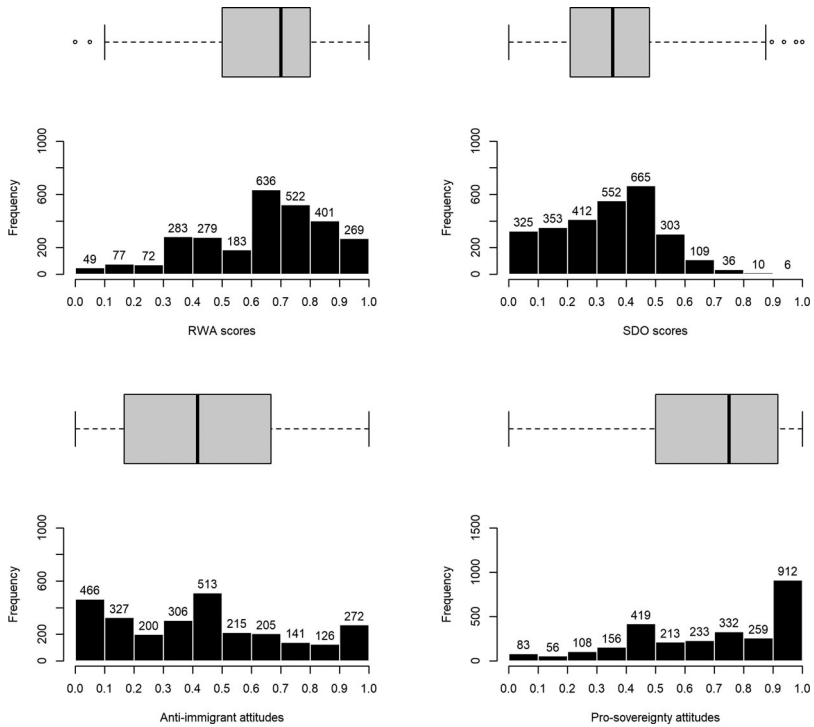


Figure 2. Boxplots and histograms for RWA, SDO, anti-immigrant attitudes, and pro-sovereignty attitudes scales.

Figure 2 contains the histograms and boxplots for RWA, SDO, anti-immigrant, and pro-sovereignty variables. Table 1 lists the Pearson correlations between these four variables.

Demographic controls

In our analyses, we also control for a number of demographics. *Age* is a continuous measure of the respondent’s age in years (mean = 55, s.d. = 15). *Education* is a 7-category scale indicating the respondent’s level of education: no qualifications (6.57%), below GCSE (3.43%), GCSE (19.88%), A-level (19.42%), undergraduate degree (35.73%), postgraduate degree (10.00%), and prefer

Table 1. Correlations among the four independent variables.

	Anti-immigrant	Pro-sovereignty	RWA	SDO
Anti-immigrant	1.000	0.613	0.532	0.414
Pro-sovereignty	0.613	1.000	0.594	0.387
RWA	0.532	0.594	1.000	0.409
SDO	0.414	0.387	0.409	1.000

Note: All correlation coefficients are significant at $p < 0.001$.

not to say (4.98%). *Ethnicity* is a trinary measure indicating whether the respondent identifies as white (94.70%), as a minority or mixed ethnicity (4.66%), or prefers not to report their ethnicity (0.65%). *EU Citizen* is a binary measure of whether the respondent identifies as a citizen of a European country (4.73%) or not (95.27%). *Gender* is a binary measure indicating whether the respondent identifies as female (49.66%) or male (50.34%). *Household Income* is a 15-category measure of the respondent's annual household income, advancing in increments of £5,000, beginning at "under £5,000 per year" and ending with "£150,000 and over" (median = £30,000 to £34,999 per year). *Religion* is a 5-category variable consisting of: none (49.37%), Church of England (30.86%), other Christian (14.07%), non-Christian (2.74%), and unidentified or other (2.96%).

Analyses

To address our hypotheses and our theoretical sequence of influence, we estimate our models in three steps. First, using OLS regression models, we model the relationship between RWA and SDO and pro-sovereignty and anti-immigrant attitudes, controlling for basic demographic characteristics. For each of these two dependent variables, we estimate both additive and interactive models. Second, we use a logit model to analyse the relationship between pro-sovereignty and anti-immigrant attitudes and vote choice in the EU Referendum. Third, we estimate a mediated moderation model to directly test whether pro-sovereignty and anti-immigrant attitudes mediate the conditional effect of RWA and SDO on vote choice.

Table 2 reports the regression coefficients for our four OLS models. For pro-sovereignty attitudes, Model 1 predicts a positive relationship between RWA and SDO and the dependent variable, controlling for demographic factors, supporting hypotheses H1a and H1b. Model 2 shows a significant interaction between RWA and SDO alongside a slightly higher R-squared value, indicating that the interactive model better fits the data. RWA and SDO therefore demonstrate a conditional relationship with pro-sovereignty attitudes, supporting hypotheses H2, H2a, and H2b.

The anti-immigrant attitudes models tell a somewhat different story. Model 3 indicates that both RWA and SDO predict anti-immigrant attitudes, supporting hypotheses H3a and H3b. However, Model 4 indicates that the relationship between RWA and SDO and anti-immigrant attitudes is not compensatory; the interaction term between RWA and SDO is not statistically significant nor do the R-squared values differ between Models 3 and 4. Model 4 fails to support hypotheses, H4, H4a, and H4b.

To facilitate interpretation of the interactions in Models 2 and 4, we plot the expected values and confidence intervals (cf., King, Tomz, and Wittenberg 2000) of the DV for each IV conditional on specific values of

Table 2. OLS regression models of pro-sovereignty and anti-immigrant attitudes.

	Pro-Sovereignty		Anti-immigrant	
	Model 1	Model 2	Model 3	Model 4
RWA	0.524 (0.022)	0.701 (0.034)	0.507 (0.025)	0.521 (0.040)
SDO	0.262 (0.024)	0.666 (0.065)	0.394 (0.028)	0.426 (0.076)
RWA x SDO		-0.624 (0.094)		-0.049 (0.109)
Age	0.001 (0.0003)	0.001 (0.0003)	-0.0001 (0.0003)	-0.0001 (0.0003)
Is an EU citizen	-0.089 (0.019)	-0.082 (0.019)	-0.087 (0.022)	-0.087 (0.022)
<u>Education</u>				
Below GCSE	-0.002 (0.026)	-0.005 (0.026)	0.019 (0.031)	0.018 (0.031)
GCSE	-0.024 (0.018)	-0.023 (0.018)	-0.032 (0.021)	-0.032 (0.021)
A-level	-0.037 (0.018)	-0.038 (0.018)	-0.062 (0.021)	-0.062 (0.021)
Undergraduate	-0.060 (0.018)	-0.061 (0.017)	-0.067 (0.020)	-0.067 (0.020)
Postgrad	-0.105 (0.021)	-0.098 (0.021)	-0.074 (0.025)	-0.073 (0.025)
Not specified	-0.052 (0.024)	-0.056 (0.023)	-0.059 (0.027)	-0.059 (0.027)
<u>Ethnicity</u>				
BaME/Mixed	0.030 (0.021)	0.024 (0.020)	-0.086 (0.024)	-0.087 (0.024)
Not specified	0.042 (0.049)	0.040 (0.049)	0.017 (0.057)	0.016 (0.057)
Female	0.031 (0.008)	0.030 (0.008)	-0.003 (0.009)	-0.003 (0.009)
HH income	-0.003 (0.001)	-0.003 (0.001)	-0.007 (0.001)	-0.007 (0.001)
<u>Religion</u>				
Church of England	0.028 (0.010)	0.026 (0.010)	0.002 (0.011)	0.002 (0.011)
Other Christian	0.013 (0.012)	0.010 (0.012)	-0.013 (0.014)	-0.014 (0.014)
Non-Christian	0.004 (0.026)	0.001 (0.026)	-0.062 (0.031)	-0.062 (0.031)
Unidentified / Other	0.034 (0.024)	0.031 (0.023)	0.048 (0.027)	0.048 (0.027)
Constant	0.249 (0.029)	0.148 (0.032)	0.078 (0.033)	0.070 (0.037)
N	2771	2771	2771	2771
R-squared	0.410	0.419	0.357	0.357
Adj. R-squared	0.406	0.415	0.353	0.353

Note: **Bolded** coefficients are significant at $p \leq 0.05$. Standard errors are in parentheses. Reference categories for categorical variables: Education, No qualifications; Ethnicity, White; Religion, No religion.

the other IV.¹ As the interaction term in Model 4 is not significant, Figure 4 largely replicates an expected values plot based on Model 3.

¹Figures 3, 4, and 5 are generated by running 100,000 simulations for each model and plotting the results. The simulations fix the control variables at their mean, median, or mode. The typical

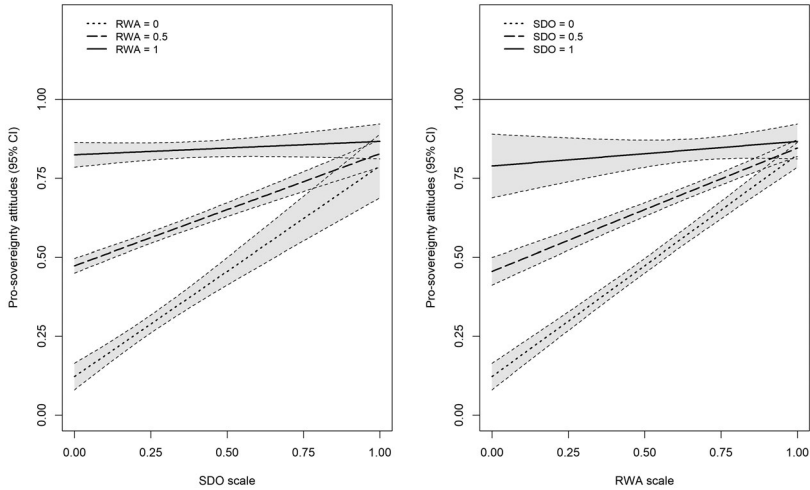


Figure 3. Expected values of pro-sovereignty attitudes conditional on RWA and SDO.

Figure 3 visualizes Model 2. We plot three distinct values of RWA (in the left panel) and SDO (in the right panel) over the range of the other variable. The simulated uncertainty around our estimates is shown in the figure as grey shading. As illustrated in both panels of Figure 3, the relationship between the relevant IV and pro-sovereignty attitudes is conditional on the other IV. In the left panel, we see that when both RWA and SDO are at 0, the expected value of pro-sovereignty attitudes is 0.123. Moving along the x-axis to SDO = 1, we expect an increase in pro-sovereignty attitudes to 0.789. When RWA = 0.5 the expected values for SDO = 0 and SDO = 1 are 0.473 and 0.828, respectively; and when RWA = 1, the expected values are 0.824 and 0.867. When SDO = 0, RWA has a clear and noticeable impact on pro-sovereignty attitudes. When SDO = 1, the expected value of pro-sovereignty attitudes remains statistically equivalent regardless of the value of RWA.

A similar pattern can be observed for the conditioning effect of SDO on the relationship between RWA and pro-sovereignty attitudes. As illustrated in the right panel of Figure 3, when SDO = 0, the expected values of pro-sovereignty attitudes are 0.123 and 0.824 when RWA = 0 and 1, respectively. The corresponding values are 0.456 and 0.845 when SDO = 0.5, and 0.789 and 0.867 when SDO = 1. Substantively, both panels illustrate that high SDO or RWA values compensate for low scores in the other. A person scoring high in RWA and low on SDO is expected to have similar pro-sovereignty attitudes to those who score high on SDO and low on RWA; both of whom will have

respondent in our data is a 55 year-old, white, male, non-EU citizen, with no religious denomination, an undergraduate degree, and a household income of £30,000 to £34,999 per year.

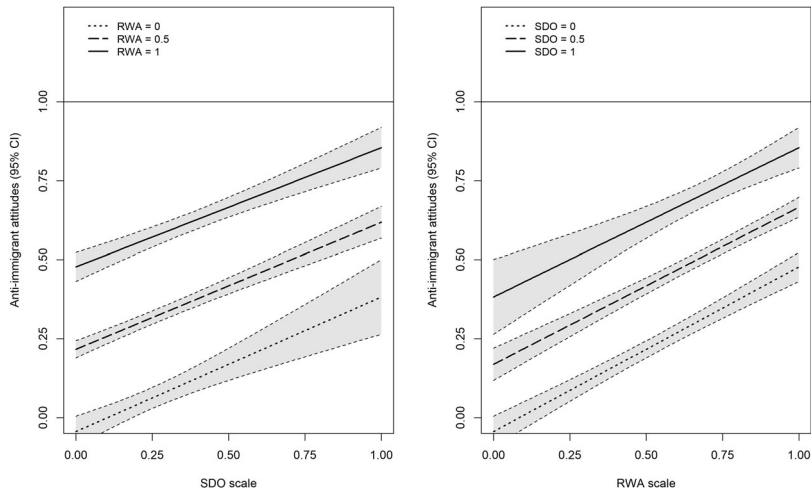


Figure 4. Expected values of anti-immigrant attitudes conditional on RWA and SDO.

similar pro-sovereignty attitudes to a person who scores high in both RWA and SDO.

Figure 4, illustrating the interactive model for anti-immigrant attitudes (Model 4), demonstrates an additive, rather than a conditional, relationship between RWA and SDO and anti-immigrant attitudes. On the left panel, when $RWA = 0$, the expected value for anti-immigrant attitudes is 0 when $SDO = 0$ and 0.383 when $SDO = 1$. When RWA is 0.5, these values are 0.217 and 0.619; and when $RWA = 1$, 0.478 and 0.854. Similarly, in the right panel, when $SDO = 0$, anti-immigrant attitudes is expected to be 0 when $RWA = 0$ and 0.478 when $RWA = 1$. These values are 0.170 and 0.666 when $SDO = 0.5$ and 0.383 and 0.854 when $SDO = 1$. This indicates that to score high on the anti-immigrant scale, one needs to score high in both RWA and SDO.

Table 3 presents a cross-tabulation of the quartiles of RWA and SDO to provide a clearer image of the joint distribution of RWA and SDO (cf., Berry, Golder, and Milton 2012). As already indicated in the histograms and boxplots from Figure 2, on average, the respondents from this sample score high on RWA and low on SDO. The joint distribution of SDO and RWA places most respondents into either the bottom two quartiles of both scales (35%) or the top two quartiles of both scales (26%).² This has fairly little consequence for the pro-sovereignty scale as the compensatory nature of the interaction between RWA and SDO means that high scores on either scale corresponds with a high score on the pro-sovereignty attitudes scale. The consequence for

²Altemeyer (1996) classifies “double-highs” as those who fall into the upper-quartile in both scales. In this sample, 8% of respondents would be considered double-highs under this classification rule.

Table 3. Cross-tabulation of quartiles of RWA and SDO.

RWA Quartiles	SDO Quartiles			
	1 [0.00-0.21]	2 [0.22-0.36]	3 [0.37-0.48]	4 [0.50-1.00]
1 [0.00-0.50]	14% (386)	7% (188)	4% (97)	3% (89)
2 [0.51-0.70]	7% (190)	7% (206)	8% (221)	7% (202)
3 [0.71-0.80]	3% (91)	4% (123)	6% (166)	5% (142)
4 [0.81-1.00]	3% (86)	6% (156)	7% (195)	8% (233)

Note: Values in brackets indicate the range of the quartile. Cell values indicate the percentage (number) of observations that fall into that intersection of quartiles.

the anti-immigrant attitudes scale is more notable. As RWA and SDO indicate an additive relationship with anti-immigrant attitudes, this particular joint distribution of those in the upper quartiles on both scales suggests that we would predict only a modest percentage of respondents would fall into the highest points on the anti-immigrant scale – which is what we see in the histogram and boxplot for anti-immigrant attitudes.

In the second stage of our analyses, we estimate a logit model that predicts voting for Brexit with sovereignty and immigrant attitudes as explanatory variables. This model is reported in Table 4.

The model output displayed in Table 4 indicates that reporting higher anti-immigrant and pro-sovereignty attitudes increases the likelihood of having voted for the UK to leave the European Union when controlling for the other. This supports hypotheses H5a and H5b. To facilitate our interpretation of this output, in Figure 4 we plot the predicted probabilities of having voted for Brexit across combinations of values for pro-sovereignty and anti-immigrant attitudes.

As illustrated in the left panel of Figure 5, when both anti-immigrant and sovereignty attitudes = 0, the predicted probability of voting to leave the EU is 0.005; when sovereignty attitudes = 1 this probability increases to 0.618. When anti-immigrant attitudes = 0.5, probability for voting to Leave the EU is 0.022 when pro-sovereignty attitudes = 0 and 0.884 when pro-sovereignty

Table 4. Logit model of vote choice during the 2016 EU referendum.

	Vote to leave the EU	
	log-odds	odds-ratios
Pro-sovereignty attitudes	5.835 (0.288)	341.909 (98.431)
Anti-immigrant attitudes	3.091 (0.229)	21.997 (5.035)
Constant	-5.351 (0.215)	0.005 (0.001)
N	2771	
Pseudo-R-squared (McKelvey & Zavoina)	0.606	

Note: **Bolded** coefficients are significant at $p \leq 0.05$. Standard errors are in parentheses.

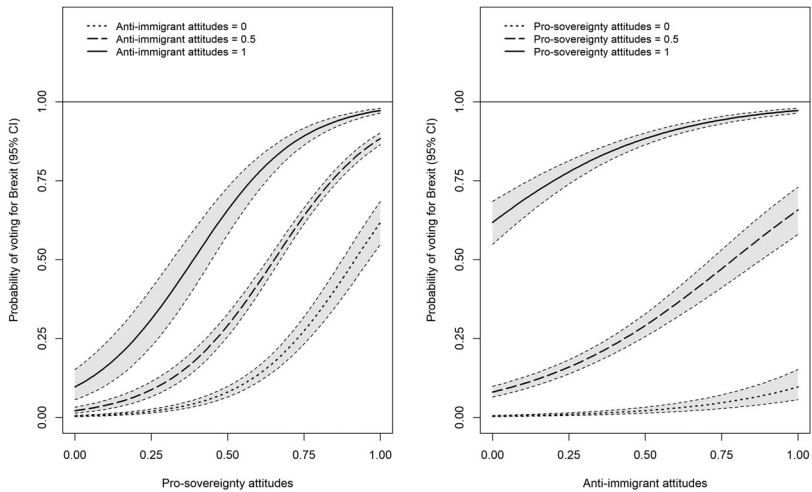


Figure 5. Predicted probability of casting a leave vote conditional on pro-sovereignty and anti-immigrant attitudes.

attitudes = 1. When anti-immigrant attitudes = 1, these probabilities shift to 0.097 and 0.972 when pro-sovereignty attitudes = 0 and 1, respectively.

In the right panel, when pro-sovereignty attitudes = 0, the probability of voting for Brexit increases from 0.005–0.097 as the value of anti-immigrant attitudes moves from 0 to 1. These probabilities are 0.081 and 0.658 when pro-sovereignty attitudes = 0.5 and 0.618 and 0.972 when pro-sovereignty attitudes = 1.

On average then, when a person is low on both anti-immigrant and pro-sovereignty attitudes, the probability of voting for Brexit is very low, barely reaching 0.005. However, as pro-sovereignty attitudes increase, the probability of voting for Brexit increases substantially. Anti-immigrant attitudes do not demonstrate the same impact. Even when an individual scores highly on the anti-immigrant attitudes scale, if they score low on the pro-sovereignty scale, their probability of voting for Brexit is low. While both anti-immigrant and pro-sovereignty attitudes play a part in vote choice, pro-sovereignty attitudes demonstrate considerably more influence. This is particularly notable given the high median score for pro-sovereignty attitudes illustrated in [Figure 2](#).

In the third and final stage of our analyses, we estimate a fully specified mediated moderation model.³ In [Figure 6](#), we visualize the output from this model. We test both indirect as well as direct effects from RWA and SDO to vote choice. As noted in [Figure 6](#), RWA and SDO are fully mediated via pro-sovereignty and anti-immigrant attitudes, supporting hypotheses

³The full tabulation of the model output is reported in the Appendix.

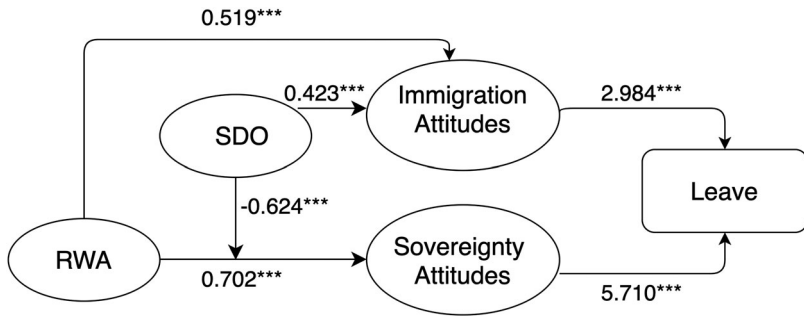


Figure 6. Visual representation of the estimated mediated moderation model. *Notes:* *** ≤ 0.001 ; only significant pathways are illustrated; control variables are not included in this visual representation but are included in the estimated model (see Appendix).

H6a and H6b; the direct pathways from RWA and SDO to vote choice are insignificant (and therefore not illustrated).

Discussion

On 23 June 2016, with a turnout of 72.2%, 51.9% of the voting public in the United Kingdom opted to leave the European Union. Since then, there has been a flurry of research into who voted to leave, who voted to remain, and why. Much of this research has focused on demographic factors with age, education, and income level being of particular note (e.g. Alabrese et al. 2019; Becker, Fetzer, and Novy 2017). However, considering the impact of beliefs about economic wellbeing and security have also brought social-psychological considerations into the picture (e.g. Clarke, Goodwin, and Whiteley 2017a; Hali-kiopoulou and Vlandas 2018). Strictly psychological considerations in this line of research are still few and far between. While we do not wish to suggest that such considerations are the only considerations that should be accounted for, we do believe that not considering psychological motivations leaves any understanding of the EU Referendum vote incomplete.

The work of Golec de Zavala, Guerra, and Simão (2017) and this paper begin to fill this hole in the current literature. These papers consider psychological traits such as right-wing authoritarianism (RWA) and social dominance orientation (SDO) to be of particular value to understanding the motivations for people’s vote choice in the EU Referendum. RWA and SDO, as frequently invoked predictors of prejudice and intolerance, find an obvious home in the discussion about a referendum where the results are frequently connected to anti-immigrant and anti-foreign sentiment. These traits both provide motivations for voting to leave the EU. Those high in RWA likely perceive immigrants as a threat to their sense of Britishness or their narrower sense of

local national identity (English, Scottish, N. Irish, Welsh) and will want to stop those who deviate from those identities from settling in the United Kingdom. Those high in SDO will see the issue from a competitive standpoint and oppose outgroups who threaten the established hierarchy of the UK and the dominance of the British in matters of resource competition or representation in politics. Therefore, those high in either RWA or SDO will be motivated to exit the European Union.

While Golec de Zavala, Guerra, and Simão (2017) make a convincing case for the relevance of these two concepts for understanding the Leave vote, we note that their approach overlooks two elements. First, they focus entirely on threat from immigrants as a mediator between RWA and SDO and the EU Referendum vote. We suggest that it is not only anti-immigrant sentiment that is important, but also issues around sovereignty. In the EU Referendum, issues were raised over both internal and external threats. While immigrants can be considered an internal threat (a threat to the UK from within the country), foreign EU bureaucrats and politicians can be considered an external threat to the UK. A primary slogan of the Leave campaign was, after all, "Take back control"; a phrase directed against non-UK politicians and bureaucrats. As such, we integrate pro-sovereignty attitudes as a second mediator for consideration.

Second, while Golec de Zavala, Guerra, and Simão (2017) forgo analysing the potential interaction between RWA and SDO, we consider the possibility of an interaction of particular importance when considering motivations for a leave vote. Wilson and Sibley (2013) note that RWA and SDO can both motivate preference for politically conservative viewpoints and behaviors. In particular, they note that higher scores on *either* of these traits can motivate political conservatism; they also note that political liberalism requires people to score low on *both* of these traits. We consider both anti-immigrant and pro-sovereignty attitudes to be politically conservative positions and therefore potentially subject to the conditionality found by Wilson and Sibley (2013). In other words, we expect that a low score on anti-immigrant and pro-sovereignty attitudes would be motivated by low scores on *both* RWA and SDO, while high scores on anti-immigrant and pro-sovereignty attitudes could be motivated by a low score on *either* RWA or SDO, or both. An additive influence would paint a somewhat different picture of a typical leave voter (high scores on both RWA and SDO) than would a conditional influence (high scores on either RWA or SDO). We therefore investigate whether RWA and SDO are additive in predicting anti-immigrant and pro-sovereignty attitudes, or conditional on one another and whether both anti-immigrant and pro-sovereignty attitudes predict a leave vote.

Our analyses of data from the 2014–2019 BES Internet Survey Panel demonstrate two particularly important points. First, RWA and SDO are compensatory in predicting pro-sovereignty attitudes. This interaction follows the

pattern discussed by Wilson and Sibley (2013): one is likely to be low on both RWA and SDO when holding weak pro-sovereignty attitudes, while high scores in either RWA or SDO (or both) predict strong pro-sovereignty attitudes. However, this compensatory relationship only holds for pro-sovereignty attitudes. RWA and SDO demonstrate only an additive relationship with anti-immigrant attitudes. This suggests that those who hold particularly strong anti-immigrant attitudes are likely to score quite highly in both RWA and SDO.

Second, anti-immigrant and pro-sovereignty attitudes are both positively related to a leave vote. However, anti-immigrant attitudes do not exhibit the most substantive relationship with vote choice as might be expected given some of the commentary around the EU Referendum. Rather, our vote choice model indicates that pro-sovereignty attitudes have a stronger substantive impact than anti-immigrant attitudes.

The combination of these relationships suggests that low scores in both RWA and SDO will produce a more accepting view of immigrants and a more sceptical view of the value of national sovereignty which in turn will likely motivate a person to vote to remain in the EU. On the other hand, a high score on either RWA and SDO is likely to lead to a pro-sovereignty orientation that, even in the absence of strong anti-immigrant sentiment (which likely requires a high score on both traits), is likely to motivate a person to leave the EU.

Though the relationships we uncover in this research are quite powerful, we wish to note that we do not suggest or expect that these traits are the only motivations for a leave or remain vote. As our models suggest, there are clearly other influences at play. Though our models could, perhaps, be more comprehensive and complex, our focus here is to suggest and evidence alternate motivations for voter behavior in the British EU Referendum rather than painting a singular and comprehensive picture of the causes of the outcome. And, as is often the case, there are a few methodological concerns to bear in mind when considering our results. The data we use are not perfectly suited for our purposes here. Principally, our dependent variable is predominantly measured previous to our independent variables. We therefore cannot be certain that our independent variables have not substantively changed since the respondent reported their vote choice. Further, as SDO, anti-immigrant attitudes, and pro-sovereignty attitudes are measured simultaneously to one another (RWA was measured one wave previous), we also cannot be sure of the direction of causality between the trait measures and the attitudinal measures. Finally, the sample we use here is not representative of those in the British public who voted in the referendum. Nevertheless, our suggested causal pathway is reasonable given previous research and the relative stability of these orientations (e.g. Osborne et al. 2020; Ludeke and Krueger 2013). As this particular event has now passed into history, it will

remain for future research to see whether these relationships hold for similar future events.

RWA and SDO are strong predictors of both anti-immigrant and pro-sovereignty attitudes which are, in turn, strong predictors of a Leave vote. This chain of relationships reinforces the idea that people's voting behavior in the EU Referendum was influenced by ingroup bias and prejudice against foreign others. RWA is a concept concerned with aggression toward those who are perceived to violate ingroup norms; SDO is concerned with maintaining group hierarchy. That either of these traits (indirectly) motivates a Leave vote indicates that many UK voters did not perceive themselves as part of an EU community and viewed EU countries and citizens as threats to their British ingroup. While this suggestion is likely not particularly surprising to those who study public opinion on the EU, it is nevertheless a lesson that bears repeating for those who wish for further and tighter integration of the EU.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

The author(s) reported there is no funding associated with the work featured in this article.

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Appendix: Full mediated moderation model output

Response	Predictor	Coefficient	Std.Error	Crit.Value	p-Value
Anti-Immig.	RWA	0.519	0.040	12.975	0.000
Anti-Immig.	SDO	0.423	0.076	5.574	0.000
Anti-Immig.	RWA*SDO	-0.043	0.109	-0.390	0.697
Anti-Immig.	Age	0.000	0.000	-0.108	0.914
Anti-Immig.	Is EU citizen	-0.086	0.022	-3.936	0.000
Anti-Immig.	BaME/Mixed	-0.048	0.018	-2.596	0.010
Anti-Immig.	Female	-0.002	0.009	-0.192	0.848
Anti-Immig.	HH income	-0.007	0.001	-4.733	0.000
Anti-Immig.	Church of Engl.	0.001	0.011	0.113	0.910
Anti-Immig.	Other Christian	-0.015	0.014	-1.069	0.285
Anti-Immig.	Non-Christian	-0.082	0.030	-2.748	0.006
Anti-Immig.	Other	0.048	0.027	1.759	0.079
Anti-Immig.	Below GCSE	0.019	0.031	0.614	0.540
Anti-Immig.	GCSE	-0.032	0.021	-1.543	0.123
Anti-Immig.	A-level	-0.062	0.021	-2.958	0.003
Anti-Immig.	Undergraduate	-0.067	0.020	-3.305	0.001
Anti-Immig.	Postgraduate	-0.075	0.025	-3.030	0.003
Anti-Immig.	Not specified	-0.057	0.027	-2.096	0.036
Sovereignty	RWA	0.702	0.034	20.497	0.000
Sovereignty	SDO	0.666	0.065	10.245	0.000
Sovereignty	RWA*SDO	-0.624	0.094	-6.677	0.000
Sovereignty	Age	0.001	0.000	3.444	0.001
Sovereignty	Is EU citizen	-0.082	0.019	-4.380	0.000
Sovereignty	BaME/Mixed	0.022	0.016	1.397	0.163
Sovereignty	Female	0.030	0.008	3.797	0.000
Sovereignty	HH income	-0.003	0.001	-2.686	0.007
Sovereignty	Church of Engl.	0.026	0.010	2.702	0.007
Sovereignty	Other Christian	0.010	0.012	0.824	0.410
Sovereignty	Non-Christian	0.002	0.025	0.061	0.952
Sovereignty	Other	0.031	0.024	1.318	0.188
Sovereignty	Below GCSE	-0.005	0.026	-0.194	0.846
Sovereignty	GCSE	-0.024	0.018	-1.329	0.184
Sovereignty	A-level	-0.038	0.018	-2.104	0.036
Sovereignty	Undergraduate	-0.061	0.018	-3.466	0.001
Sovereignty	Postgraduate	-0.098	0.021	-4.652	0.000
Sovereignty	Not specified	-0.056	0.024	-2.397	0.017
EU vote	Anti-Immig.	2.984	0.241	12.366	0.000
EU vote	Sovereignty	5.710	0.303	18.837	0.000
EU vote	RWA	0.698	0.594	1.175	0.240
EU vote	SDO	1.177	1.068	1.102	0.271
EU vote	RWA*SDO	-1.336	1.539	-0.868	0.385

Note: This model was estimated as a pathmodel with piecewiseSEM (Piecewise Structural Equation Modeling in R). The overall model fit is Fisher's C = 539.179 (p < 0.000). R-Square (Anti-Immigration) is 0.36 and R-Square (Sovereignty) is 0.42. No R-Square available for EU vote sub-model, as it is a logistic regression. **bolded** coefficients are significant at p ≤ 0.05. Reference categories for categorical variables: Education, No qualifications; Ethnicity, White; Religion, No religion.