Supporting information for:
Democracy Belief Systems in Europe: Cognitive Availability and Attitudinal Constraint

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Appendix A: Question Wording

Table A1: Question wording and operationalization

Variable	Wording / Coding
Dependent Variables	
Cognitive availability	Additive index of the number of *don't know* responses provided to the 36 questions measuring democratic aspirations and democratic evaluations. Rescaled to range between 0 and 100 with higher values indicating a lower number of don't know answer or higher cognitive availability. See data and methods section for further details.
Horizontal constraint	Variable that summarizes the number of Gutman errors associated to each respondent in order to measure their level of horizontal constraint. Gutman errors are calculated from the Mokken scale summarized in table 2. Rescaled to range between 0 and 100 with higher values indicating a lower number of Gutman errors and, therefore, higher horizontal constraint. See data and methods section for further details.
Vertical constraint	Variable that summarizes the absolute value of the residuals associated to each individual from a regression model in which the index of liberal democratic aspirations is specified as the dependent variable and the generic preference to live in a democracy is specified as the independent variable.
Independent variables (Individual level)	
Education (Categorical):	"What is the highest level of education you have successfully completed?" Categories adapted to each country in which the survey was conducted and later recoded into the ESS Education Detailed ISCED Coding Frame. From these categories and according to the ISCED classification I divided the sample into three different groups: Primary or less; Secondary; University - Primary - Secondary - University
Political interest (categorical)	"How interested would you say you are in politics- are you:" - Very interested - Quite interested - Hardly interested - Not at all interested
Age	Age in years
Gender	Gender of the respondent. Coded 2 = Female 1 = Male
Independent variables (Country level)	
Historical experience of democracy	Number of years that a country has been a democracy according to Polity IV (country is considered democratic if it has a value higher than 6 in the Polity IV database). Values higher than 100 are recoded to take value 100 (see footnote 9 for justification). The final variable is rescaled to range between 0 and 1.
Variables capturing democratic aspirations and democratic evaluations used to generate the different dependent variables as explained in the data and methods section (except for introductory statement, common wording for aspirations and evaluations, except for trade-off questions)	
Introductory statement aspirations	Now some questions about democracy. Later on I will ask you about how democracy is working in [country]. First, however, I want you to think instead about how important you think different things are for democracy in general. There are no right or wrong answers so please just tell me what you think. Using this card, please tell me how important you think it is for democracy in general. 0 means you think this is not at all important for democracy in general and 10 means you think it is extremely important for democracy in general.
Introductory statement evaluations	Now some questions about the same topics, but this time about how you think democracy is working in [country] today. Again, there are no right or wrong answers, so please just tell me what you think. Using this card, please tell me to what extent you think each of the

	following statements applies in [country]. 0 means you think the statement does not apply at all and 10 means you think it applies completely
Equality before the law (Rule of law)	That courts treat everyone the same
Freedom and fairness of elections	That national elections are free and fair
Horizontal accountability	That courts are able to stop the government acting beyond its authority
Media reliability	That the media provide citizens with reliable information to judge the government
Vertical accountability	That governing parties are punished in elections when they have done a bad job
Government justification	That the government explains its decisions to voters
Protection of minorities' rights	That the rights of minority groups are protected
Parties' freedom	That opposition parties are free to criticize the government
Press freedom	That the media are free to criticize the government
Differentiated partisan offer	That different political parties offer clear alternatives to one another
Political deliberation	That voters discuss politics with people they know before deciding how to vote
Direct-democracy (referenda)	That citizens have the final say on the most important political issues by voting on them directly in referendums
Migrants' voting rights	That immigrants only get the right to vote in national elections once they become citizens
Responsibility towards other European governments	That politicians take into account the views of other European governments before making decisions
Protection against poverty	That the government protects all citizens against poverty
Reduction income differences	That the government takes measures to reduce differences in income levels?
Introductory statement trade-off questions	At the next questions, I'll first ask you to choose between two options. Then I'll ask how important you think your choice is for democracy in general. Finally, I'll ask you to think about this issue in [country] today. Remember, there are no right or wrong answers, so please just tell me what you think.
Power sharing	Sometimes the government disagrees with what most people think is best for the country. Which one of the statements on this card describes what you think is best for democracy in general?: (a) A single party forms the government (b) Two or more parties in coalition form the government (c) It depends on the circumstances
Freedom of expression	There are differing opinions on whether or not everyone should be free to express their political views openly in a democracy, even if they are extreme. Which one of the statements on this card describes what you think is best for democracy in general? (a) Everyone should be free to express their political views openly, even if they are extreme (b) Those who hold extreme political views should be prevented from expressing them openly (c) It depends on the circumstances
Responsiveness	Sometimes the government disagrees with what most people think is best for the country. Which one of the statements on this card describes what you think is best for democracy in general? (a) The government should change its planned policies in response to what most people think (b) The government should stick to its planned policies regardless of what most people think (c) It depends on the circumstances
Other variables used to generate the dependent variables	
Generic preference to live in a democracy	How important is it for you to live in a country that is governed democratically? Choose your answer from this card where 0 is not at all important and 10 is extremely important.

Index of liberal democratic aspirations	Sum index of the liberal democratic aspirations measured from 0 to 10 for the following elements of democracy: rule of law, free elections, horizontal accountability, media reliability, vertical accountability, government justification, minorities' rights, parties' freedom, press freedom, differentiated partisan offer, political deliberation.

Appendix B: Mokken scale analysis of cognitive availability items

Table B1: Mokken scale analysis of cognitive availability items ("E" indicates evaluation item and "A" indicates aspiration item)

Democratic principle	Pr(x=1)	Loevinger H
Government responsibility (E)	13.4	0.58
Power sharing (E)	9.3	0.43
Government responsibility (A)	8.6	0.50
Power sharing (A)	7.3	0.36
Government responsiveness (E)	7.1	0.43
Minorities' rights (E)	6.9	0.42
Vertical accountability (E)	6.1	0.47
Differentiated partisan offer (E)	6	0.50
Migrants' voting rights (A)	5.8	0.43
Political deliberation (E)	5.8	0.45
Direct democracy (E)	5.6	0.47
Freedom of expression (E)	5.3	0.38
Horizontal accountability (A)	5	0.44
Government responsiveness (A)	4.8	0.35
Freedom of expression (A)	4.6	0.33
Parties' freedom (E)	4.5	0.49
Rule of law (E)	4.2	0.40
Differentiated partisan offer (A)	4.1	0.48
Media reliability (E)	4.1	0.48
Political deliberation (A)	4	0.47
Reduction income differences (E)	4	0.45
Government justification (E)	3.8	0.50
Vertical accountability (A)	3.7	0.47
Minorities' rights (A)	3.7	0.45
Direct democracy (A)	3.6	0.49
Free elections (E)	3.6	0.45
Parties' freedom (A)	3.5	0.52
Press freedom (E)	3.5	0.52
Reduction income differences (A)	2.7	0.51
Press freedom (A)	2.7	0.57
Media reliability (A)	2.3	0.60
Government justification (A)	2.3	0.60
Protection against poverty (E)	2.3	0.53
Free elections (A)	2.2	0.57
Protection against poverty (A)	1.8	0.60
Rule of law (A)	1.8	0.61
Migrants' voting rights (E)	-	-
Horizontal accountability (E)	-	-
Loevinger H of scalability		0.47

Table B1 summarizes the results of the Mokken scale analysis of the cognitive availability items. The second column Pr (x=1) indicates the difficulty parameter for each of the items, with more difficult items taking higher values. This is measured by the proportion of *don't know* answers to each of the items. The third column summarizes the Loevinger-H index for each of the items, and, at the bottom of the table, the Loevinger-H coefficient of scalability is summarized. Scales and items with a scalability coefficient higher than

0.3 satisfy a Mokken scale, and scales with a value higher than 0.5 are strong (Mokken, 1971). Hence, these results indicate that all items have good scalability properties and that the cognitive availability items satisfy a Mokken scale.

Table B2 summarizes the results of the Mokken scale analysis distinguishing between democratic aspirations and democratic evaluation items. These results indicate that, even when considering democratic aspirations and evaluations independently, all items have good scalability properties and both scales are strong.

Table B2: Mokken scale analysis of cognitive availability items distinguishing between democratic aspirations and evaluations

Aspirations			Evaluations		
	Pr(x=1)	Loevinger H		Pr(x=1)	Loevinger H
Government responsibility	8.6	0.55	Government responsibility	13.4	0.58
Power sharing	7.3	0.38	Power sharing	9.3	0.43
Migrants' voting rights	5.8	0.50	Government responsiveness	7.1	0.44
Horizontal accountability	5.0	0.50	Minorities' rights	6.9	0.43
Government responsiveness	4.8	0.36	Vertical accountability	6.1	0.50
Freedom of expression	4.6	0.34	Differentiated partisan offer	6.0	0.51
Differentiated partisan offer	4.1	0.53	Political deliberation	5.8	0.46
Vertical accountability	3.7	0.50	Direct democracy	5.6	0.50
Direct democracy	3.6	0.53	Freedom of expression	5.3	0.40
Political deliberation	4.0	0.52	Parties' freedom	4.5	0.53
Parties' freedom	3.5	0.56	Rule of law	4.2	0.44
Minorities' rights	3.7	0.49	Reduction income differences	4.0	0.49
Reduction income differences	2.7	0.54	Media reliability	4.1	0.52
Press freedom	2.7	0.61	Government justification	3.8	0.56
Media reliability	2.3	0.64	Free elections	3.6	0.50
Government justification	2.3	0.63	Press freedom	3.5	0.58
Free elections	2.2	0.61	Protection against poverty	2.3	0.62
Protection against poverty	1.8	0.62	Migrants' voting rights	-	-
Rule of law	1.8	0.66	Horizontal accountability	-	-
Loevinger H of scalability		0.52	Loevinger H of scalability		0.49

Appendix C: Cross-level interactions

Table C1: The correlates of DBS: Cross-level interaction between education and historical experience of democracy.

	(1) Cognitive availability	(2) Horizontal constraint	(3) Vertical constraint
Individual level variables			
Education (ref: primary)			
- Secondary	9.11**	0.74*	0.87**
	(1.59)	(0.35)	(0.32)
- University	10.82**	1.24**	1.86**
	(1.80)	(0.37)	(0.39)
Political interest (ref: not interested)			
- Hardly interested	6.90**	0.79**	1.32**
	(0.21)	(0.18)	(0.12)
- Quite interested	6.65**	1.30**	2.15**
	(0.15)	(0.14)	(0.12)
- Very interested	5.24**	0.83**	2.08**
	(0.14)	(0.13)	(0.16)
Age	0.29**	0.05**	0.05**
	(0.01)	(0.01)	(0.01)
Age^2	-0.00**	-0.00**	-0.00**
	(0.00)	(0.00)	(0.00)
Female	-1.71**	0.56**	0.03
	(0.10)	(0.09)	(0.08)
Country-level variables			
Historical experience democracy	0.10**	0.00	0.03**
	(0.04)	(0.01)	(0.01)
Cross-level interactions			
Historical experience democracy*Education			
- Secondary	-0.07*	0.00	0.01
	(0.03)	(0.01)	(0.01)
- University	-0.09**	0.00	0.01
	(0.03)	(0.01)	(0.01)
Constant	77.38**	88.70**	84.39**
	(2.02)	(0.59)	(0.63)
Random-effects parameters			
SD Secondary education (random slope)	4.53**		0.00
	(0.70)		(0.08)
SD University education (random slope)	5.16**		0.58**
	(0.77)		(0.13)
SD Constant (random intercept)	5.80**	1.25**	1.40**
	(0.83)	(0.35)	(0.19)
Observations	52,379	47,293	46,810
Number of groups	29	29	29

Standard errors in parentheses ** p<0.01, * p<0.05

As a difference from the models fitted in Table 4 and in order to facilitate the graphical interpretation of cross-level interactions (see Figure 2) in these models the variable

measuring the historical experience of democracy is fitted in its original metric and ranges between 0 and 100 (in the model summarized in Table 4 the variable was rescaled to range between 0 and 1) .

In the case of horizontal constraint (Model 2), the model does not include random slopes for the different levels of education, since including those prevents the model from converging. In any case, the model with random slopes would probably be more conservative in terms of the size of the standard errors and would probably lead to the same substantive findings. That is, that the historical experience of democracy does not moderate the differences across education groups.

Appendix D: Alternative operationalization of horizontal constraint and additional analyses of horizontal constraint

In this appendix I operationalize and analyze the alternative measure of horizontal constraint discussed in the "Data and methods" section of the paper. This measure adopts a fully deductive approach in order to operationalize horizontal constraint. This approach follows a logic similar to that of the original measure based on the Gutman errors from the Mokken scale. However, in this case, in order to operationalize horizontal constraint I simply count how many times a respondent considers that any liberal principle is more important than the two essential liberal democracy principles: free elections and the rule of law. I then reverse the count measure and rescale it so that it ranges between 0 and 100 (as in the original measure). Hence, the measure takes higher values for those who attribute an importance to non-essential elements of democracy that is equal or lower than that attributed to free elections and the rule of law.

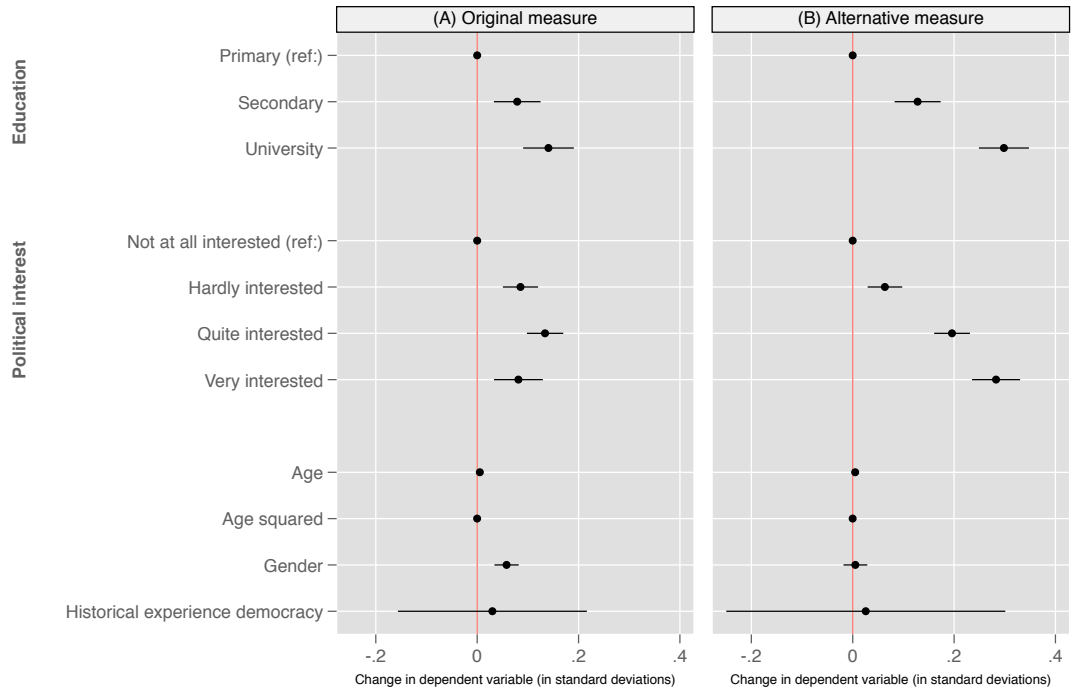
As in the case of the original horizontal constraint variable, the alternative measure is rightly skewed with a mean of 88.5 and a standard deviation of 18. As I argue above though, this measure is inferior to the one used throughout the paper since it does not provide a threshold to judge whether horizontal constraint levels are high or low. Therefore, through this measure it is not possible to determine which proportion of citizens have a horizontally constrained DBS. In any case, 60 percent of respondents have the highest score in this alternative measure of horizontal constraint (100). These are people who, in comparison to the importance they attribute to free elections and the rule of law, do not attribute a higher importance to any of the 9 non-essential elements of the liberal model of democracy. This proportion is similar to the proportion of citizens who have a DBS with a strong level of horizontal constraint (65.1 percent).[1] Therefore, the conclusion we would reach with this alternative operationalization is similar to the one reached with the original measure: a majority of citizens have a DBS that is coherently structured (horizontally constrained).

Next, I assess how the original and the alternative measures compare when it comes to the correlates of horizontal constraint. To ensure that the two measures are comparable I

[1] This is the proportion of citizens with a value higher than 93.7 in the original horizontal constraint measure, which is equivalent to an H index of 0.5 or greater.

standardize them by dividing them by their standard deviation. The results obtained with each of the measures are summarized in Figure D1. Overall, the substantive findings are quite similar. Independently of the operationalization of horizontal constraint, those who are more educated and have higher levels of political interest have slightly higher levels of horizontal constraint. Moreover, in both cases the effect of countries' historical experience of democracy is very close to 0 and not statistically significant. However, it seems that, in the alternative operationalization, the effects of education and political interest are more pronounced. Hence, when using the alternative operationalization the differences between the most interested/educated and the least interested/educated are larger. However, even in this case the conclusion would still be that these differences are of reduced magnitude.

Figure D1: Correlates of horizontal constraint: original measure (A); alternative measure (B). Random intercepts linear models.[2]



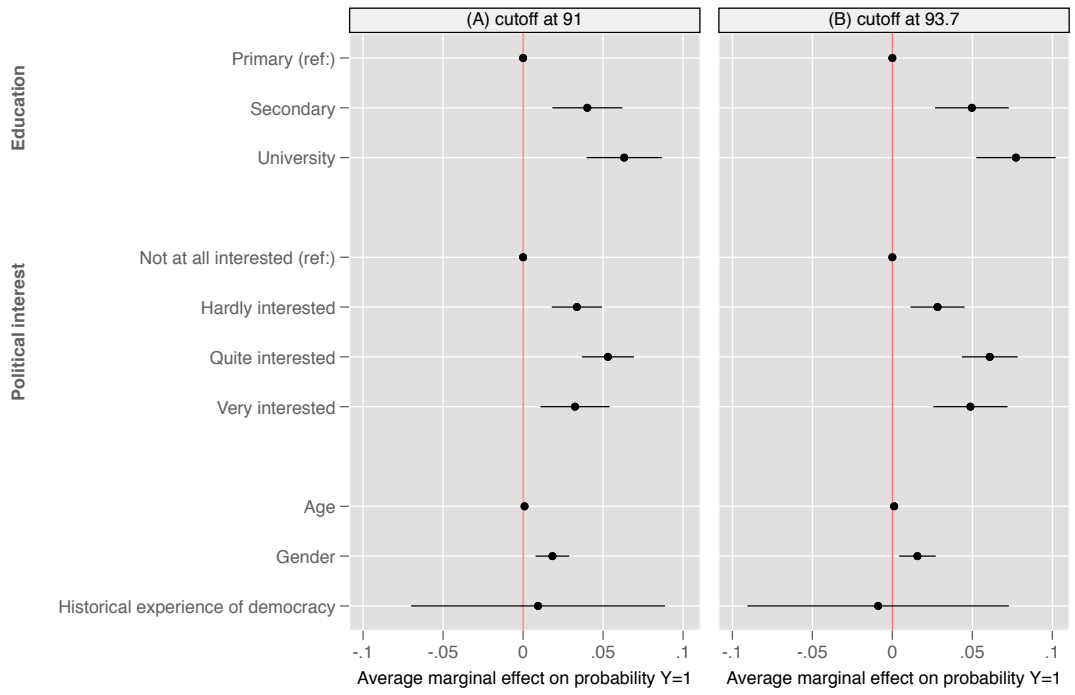
Another alternative to analyze the horizontal constraint of DBS would be to dichotomize the original scale so that it takes the value 0 for those with an unconstrained belief system and the value 1 for those who have a coherently organized belief system. For this purpose,

[2] In all the coefficient plots of these Supplementary Materials the lines represent 99 percent confidence intervals.

one can use the two thresholds discussed in the "Results" section. One option is to assign the value 1 to respondents with a value higher than 91 in the original horizontal constraint measure. This corresponds to an H-index of 0.3 in a Mokken scale, which means that a set of items has acceptable scalability properties. Another option is to assign the value 1 only to respondents with a value higher than 93.7 in the horizontal constraint scale. This corresponds to an H-index of 0.5 in a Mokken scale, and, therefore, these citizens can be considered to have a strongly horizontally constrained DBS.

Figure D2 summarizes the effects of the correlates analyzed in this paper on these two alternative operationalizations of DBS. Panel A summarizes the results for the measure based on the 91 threshold, and Panel B the results corresponding to the 93.7 cutoff. Both models are estimated through random intercepts logistic models, and the figures summarize the average marginal effects of each covariate. Again, the conclusions one reaches with this alternative operationalization are very similar to those based on the models fitted using the full scale of the horizontal constraint measure (see Panel A in Figure D1).

Figure D2: Correlates of horizontal constraint: dichotomous measures based on H-index thresholds. Average marginal effects from random intercepts logistic models.



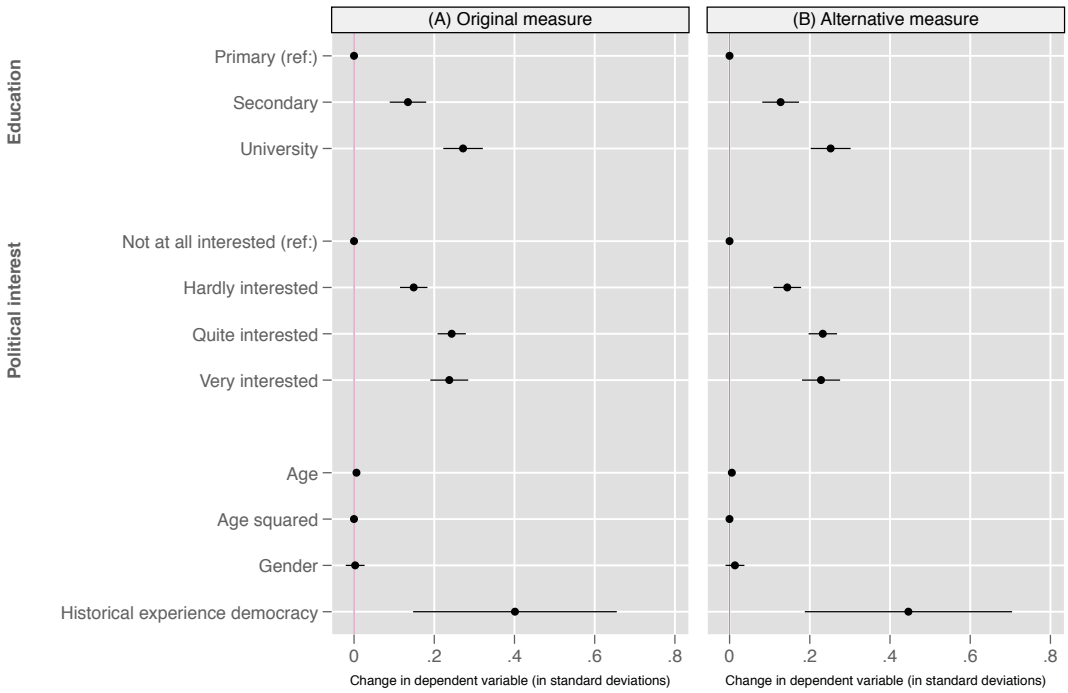
Appendix E: Alternative operationalization of vertical constraint

In the "Results" section I have discussed the possibility that some of the results about the correlates of vertical constraint might be driven by the fact that the measure of specific democratic aspirations used to estimate vertical constraint exclusively includes principles related to the liberal model of democracy. To assess the plausibility of this rival explanation I have operationalized an alternative measure of vertical constraint. This measure of vertical constraint is estimated as the original one, but besides the eleven items measuring aspirations related to the liberal model of democracy it also includes two items measuring aspirations about the social-justice model of democracy (reduction of income differences and protection against poverty) and one item measuring aspirations about the direct-democratic model of democracy. The measure of democratic aspirations is obtained by adding all these principles of democracy and dividing this measure by the number of items (14). Then, as in the case of the original vertical constraint measure, I first estimate an OLS model in which these democratic aspirations are specified as the dependent variable and the generic preference to live in democracy as the independent variable. In a second step the absolute value of the residuals of this model are calculated for each respondent. The resulting variable is rescaled to range between 0 and 100 and is reversed so that higher values indicate smaller residuals and, therefore, higher vertical constraint.

Figure E1 summarizes how the two measures compare when it comes to the correlates of vertical constraint. To ensure that the two measures are comparable I standardize them by dividing each by their standard deviation. The results of the model fitted with this alternative operationalization are summarized in Panel B of Figure E1. A comparison with the results obtained through the original vertical constraint measure used throughout the paper (Panel A of Figure E1) reveal that the effects of the main covariates are very similar between these two different operationalizations.[3]

[3] Due to the inclusion of additional items to estimate the alterative measure of vertical constraint the number of individuals included in each model is different. The model estimated through the original measure includes 46,810 individuals. The model estimated through the alternative measure includes 46,180 individuals.

Figure E1: Correlates of vertical constraint: original measure (A); alternative measure (B). Random intercepts linear models.



Appendix F: Correlates of vertical and horizontal constraint at different levels of cognitive availability

In the "Conclusion" section I point out that the analyses of the correlates of vertical and horizontal constraint are restricted to the subsample of respondents who did not provide any *don't know* answer for any of the 11 liberal democratic aspirations items used to operationalize vertical and horizontal constraint. The reason for excluding these respondents is that including individuals who have a missing values for any of the principles of democracy used to estimate vertical and horizontal constraint will bias the estimation of the number of Gutman errors and the estimated levels of attitudinal constraint (because the levels of constraint would be estimated using a smaller number of liberal democratic principles). This implies that approximately 12 percent of the original ESS sample is not included in the analyses of the correlates of horizontal and vertical constraint. Therefore, in order to provide a more detailed analysis of Europeans' DBS, in this appendix I conduct a separate analysis of the correlates of vertical and horizontal constraint at different levels of cognitive availability. However, one must note that full cognitive availability for the 11 items measuring liberal democratic aspiration is still required in order to estimate vertical and horizontal constraint. The subsample with low levels of cognitive availability summarized in these analyses is, therefore, limited to respondents who provided a valid answer to these 11 items but admitted they did not know how to answer any of the remaining questions about their democratic aspirations and evaluations. Therefore, the analyses are likely to exclude those with the lowest levels of cognitive availability, since these are the ones that failed to provide a valid answer about their liberal democratic aspirations (the liberal democratic aspirations items are, according to Table B1, among the easiest ones).

Figure F1 summarizes the results of the analysis of the correlates of vertical constraint at different levels of cognitive availability. Panel A is equivalent to the original Model 3 in Table 4, which summarizes the results obtained using the full sample of respondents, who have not provided any *don't know* answer for any of the liberal democratic aspirations items. Panel B summarizes the results corresponding to the respondents who have full cognitive availability. That is, those respondents who provide a valid answer to all the 36 questions about their democratic aspirations and evaluations (66 percent of the sample). Panel C summarizes the results for respondents with partial

cognitive availability. That is, those respondents who fail to provide a valid answer to at least one of the 25 remaining questions (after excluding the 11 items referring to liberal aspirations). The results summarized in Figure F1 do not alter the conclusions about the main correlates of vertical accountability. Independently of the levels of cognitive availability, the historical experience of democracy at the country-level, as well as individuals' political interest and education, still have a substantial impact on vertical constraint.

Figure F1: Correlates of vertical constraint: original sample (A); respondents with full cognitive availability (B); respondents with partial cognitive availability (C). Random intercepts linear models.

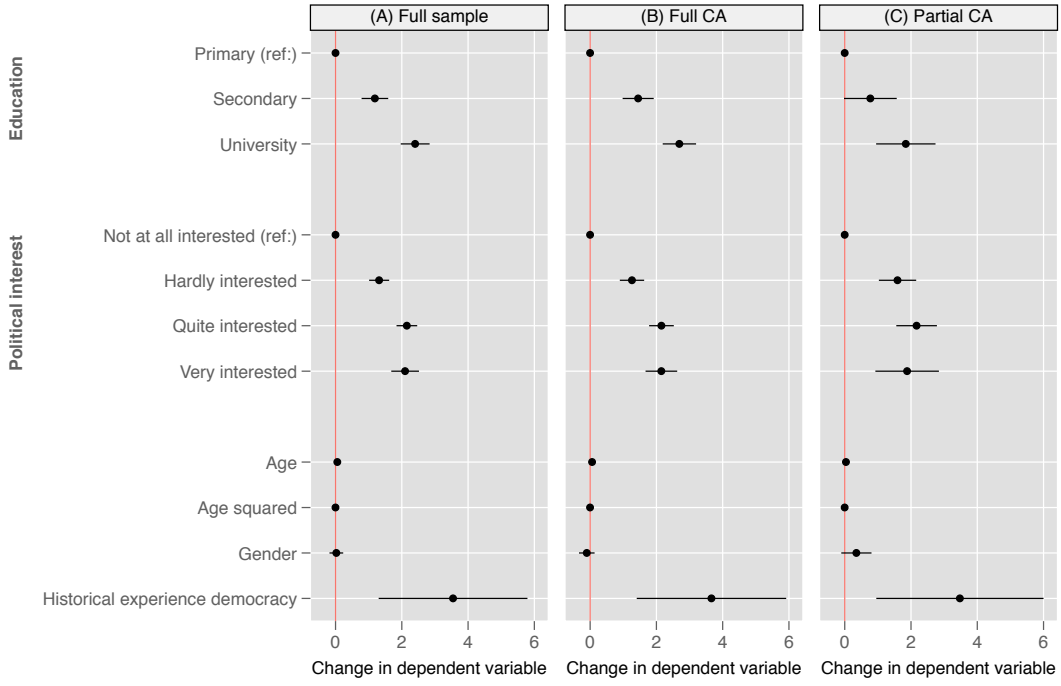


Figure F2 summarizes the results of the analysis of the correlates of horizontal constraint at different levels of cognitive availability. Like in Figure F1, panel A is equivalent to the original Model 2 in Table 4 and summarizes the results using the full sample of respondents. Panel B summarizes the results corresponding to the respondents who have full cognitive availability, and Panel C summarizes the results for respondents with partial cognitive availability. The results summarized in Figure F2 reveal some differences in the size and statistical significance of the correlates of horizontal constraint depending on individuals' levels of cognitive availability. These correlates appear to be more influential

in the case of those with high levels of cognitive availability. In any case, these results do not alter the main conclusion of the paper with regard to the correlates of horizontal constraint. The results obtained using the full sample (Panel A of Figure F2), and summarized throughout the paper, lead to the conclusion that there is no substantial variation in levels of horizontal constraint across population subgroups, since the effects of all the variables is negligible. Even though some of the coefficients for the full sample are statistically significant, their substantive impact on horizontal constraint is very limited. This is the same conclusion that we reach when distinguishing between different levels of cognitive availability. Even if the coefficients for some correlates are statistically significant for those with high cognitive availability but not for those with lower cognitive availability, in both cases we reach the conclusion that the effects of these variables is very weak.

Figure F2: Correlates of horizontal constraint: original sample (A); respondents with full cognitive availability (B); respondents with partial cognitive availability (C). Random intercepts linear models.