

Supplementary file

Beyond Apathy: Representative Performance as a Driver of the Age Gap in Voter Turnout

APPENDIX 1 - 6

APPENDIX 1

Table A1.1. Additional Information for Multilevel Logistic Regression Models of the Table 1

Model	N	Countries	Country– elec units	AIC	BIC	logLik	SD ctry int.	SD ctry–elec int.	SD young slope	Corr(int, slope)
Model 1	270,337	29	160	181,203.8	181,277.4	-90,594.9	0.538	0.258	0.270	-0.371
Model 2	187,308	29	147	108,091.4	108,385.5	-54,016.7	0.514	0.176	0.291	-0.007
Model 3	173,072	29	135	102,964.7	103,306.8	-51,448.4	0.472	0.106	0.298	-0.237
Model 4	173,072	29	135	102,966.5	103,308.6	-51,449.3	0.459	0.112	0.298	-0.241
Model 5	173,072	29	135	102,862.3	103,224.5	-51,395.1	0.443	0.105	0.274	-0.101
Model 6	173,072	29	135	102,860.4	103,222.6	-51,394.2	0.473	0.097	0.277	-0.108
Model 7	173,072	29	135	102,948.5	103,310.7	-51,438.3	0.484	0.110	0.296	-0.250
Model 8	173,072	29	135	102,966.7	103,328.9	-51,447.3	0.441	0.111	0.294	-0.232
Model 9	173,072	29	135	102,863.1	103,245.5	-51,393.6	0.439	0.105	0.272	-0.121
Model 10	173,072	29	135	102,861.0	103,243.3	-51,392.5	0.472	0.098	0.276	-0.107

APPENDIX 2

Table A2. Robustness to macroeconomic controls

	Model 11.1	Model 11.2	Model 11.3	Model 11.4	Model 11.5	Model 11.6
Aged 18–29 (ref: 60+)	-1.125*** (0.045)	-1.218*** (0.046)	-1.132*** (0.046)	-1.127*** (0.045)	-1.219*** (0.046)	-1.133*** (0.039)
Aged 30–59 (ref: 60+)	-0.515*** (0.023)	-0.626*** (0.021)	-0.526*** (0.023)	-0.516*** (0.023)	-0.616*** (0.022)	-0.520*** (0.020)
Female	0.165*** (0.016)	0.165*** (0.016)	0.165*** (0.016)	0.165*** (0.016)	0.165*** (0.016)	0.166*** (0.015)
Education: < Lower secondary	-0.293*** (0.029)	-0.276*** (0.028)	-0.290*** (0.029)	-0.292*** (0.029)	-0.281*** (0.029)	-0.292*** (0.027)
Education: Lower secondary	-0.337*** (0.022)	-0.338*** (0.022)	-0.337*** (0.022)	-0.337*** (0.022)	-0.339*** (0.022)	-0.336*** (0.020)
Education: Post-secondary non-tertiary	0.169*** (0.042)	0.172*** (0.042)	0.169*** (0.042)	0.169*** (0.042)	0.170*** (0.042)	0.169*** (0.038)
Education: Tertiary	0.230*** (0.023)	0.232*** (0.023)	0.231*** (0.023)	0.230*** (0.023)	0.229*** (0.023)	0.232*** (0.021)
Household income	0.240*** (0.009)	0.239*** (0.009)	0.240*** (0.009)	0.240*** (0.009)	0.239*** (0.009)	0.241*** (0.008)
Close to party	0.903*** (0.017)	0.904*** (0.017)	0.903*** (0.017)	0.902*** (0.017)	0.903*** (0.017)	0.903*** (0.016)
Political interest: Not at all	-1.408*** (0.035)	-1.407*** (0.035)	-1.407*** (0.035)	-1.408*** (0.035)	-1.410*** (0.035)	-1.405*** (0.033)
Political interest: Hardly	-0.825*** (0.032)	-0.823*** (0.032)	-0.824*** (0.032)	-0.825*** (0.032)	-0.824*** (0.032)	-0.822*** (0.030)
Political interest: Quite	-0.228*** (0.032)	-0.227*** (0.032)	-0.228*** (0.032)	-0.228*** (0.032)	-0.228*** (0.032)	-0.225*** (0.030)
Political trust	0.157*** (0.009)	0.157*** (0.009)	0.158*** (0.009)	0.158*** (0.009)	0.157*** (0.009)	0.158*** (0.009)
Postmaterial attitudes	0.017* (0.008)	0.019* (0.008)	0.017* (0.008)	0.017* (0.008)	0.019* (0.008)	0.017* (0.008)
% MPs under 30	-0.253*** (0.041)	-0.014 (0.035)	-0.241*** (0.042)	-0.236*** (0.040)	-0.005 (0.035)	-0.238*** (0.031)
Postmaterialist salience				0.034 (0.029)	0.011 (0.033)	0.015 (0.027)
Materialist salience	-0.052 (0.028)	0.041 (0.035)	-0.017 (0.035)			
Compulsory voting	0.551** (0.196)	0.535** (0.193)	0.553** (0.196)	0.626** (0.190)	0.602** (0.189)	0.644*** (0.140)
Electoral system: Majoritarian	-0.476 (0.356)	-0.484 (0.356)	-0.473 (0.356)	-0.456 (0.331)	-0.469 (0.330)	-0.446 (0.328)
Electoral system: Mixed	-0.149 (0.114)	-0.172 (0.117)	-0.149 (0.115)	-0.120 (0.116)	-0.149 (0.117)	-0.118 (0.102)

	Model 11.1	Model 11.2	Model 11.3	Model 11.4	Model 11.5	Model 11.6
GDP growth rate	-0.009 (0.026)	-0.014 (0.026)	-0.009 (0.026)	-0.013 (0.026)	-0.018 (0.027)	-0.012 (0.022)
Youth unemployment rate (15–29)	-0.015 (0.028)	-0.014 (0.029)	-0.015 (0.028)	-0.008 (0.030)	-0.008 (0.030)	-0.007 (0.026)
Age 18–29 × % MPs under 30	0.349*** (0.053)		0.338*** (0.054)	0.344*** (0.053)		0.350*** (0.042)
Age 30–59 × % MPs under 30	0.292*** (0.029)		0.278*** (0.030)	0.291*** (0.029)		0.294*** (0.023)
Age 18–29 × Postmaterialist salience					0.068 (0.045)	0.071 (0.038)
Age 30–59 × Postmaterialist salience					0.021 (0.018)	0.018 (0.017)
Age 18–29 × Materialist salience		-0.075 (0.049)	-0.032 (0.048)			
Age 30–59 × Materialist salience		-0.115*** (0.025)	-0.048 (0.026)			
Observations	173072	173072	173072	173072	173072	173072
ESS Round FE	Yes	Yes	Yes	Yes	Yes	Yes
Random intercepts	Country + country-election					
Random slope	Yes	Yes	Yes	Yes	Yes	Yes

Entries are logit coefficients with standard errors in parentheses. ESS round fixed effects included (omitted from display). Survey weights applied. Random intercepts for country and country-election.

APPENDIX 3

Table A3. Alternative operationalization of descriptive representation

	Model 12.1	Model 12.2
Aged 18–29 (ref: 60+)	-1.147*** (0.045)	-1.146*** (0.045)
Aged 30–59 (ref: 60+)	-0.536*** (0.022)	-0.535*** (0.022)
Female	0.164*** (0.016)	0.164*** (0.016)
Education: < Lower secondary	-0.286*** (0.028)	-0.286*** (0.028)
Education: Lower secondary	-0.340*** (0.022)	-0.339*** (0.022)
Education: Post-secondary non-tertiary	0.170*** (0.042)	0.170*** (0.042)
Education: Tertiary	0.230*** (0.023)	0.230*** (0.023)
Household income	0.240*** (0.009)	0.239*** (0.009)
Close to party	0.903*** (0.017)	0.903*** (0.017)
Political interest: Not at all	-1.407*** (0.035)	-1.408*** (0.035)
Political interest: Hardly	-0.824*** (0.032)	-0.823*** (0.032)
Political interest: Quite	-0.228*** (0.032)	-0.227*** (0.032)
Political trust	0.158*** (0.009)	0.158*** (0.009)
Postmaterial attitudes	0.017* (0.008)	0.018* (0.008)
% MPs under 40	-0.190*** (0.041)	-0.229*** (0.043)
Postmaterialist salience	0.031 (0.029)	
Materialist salience		-0.066* (0.030)
Compulsory voting	0.610** (0.189)	0.523** (0.195)
Electoral system: Majoritarian	-0.490 (0.342)	-0.550 (0.376)
Electoral system: Mixed	-0.094 (0.114)	-0.118 (0.109)
Age 18–29 × % MPs under 40	0.243*** (0.046)	0.244*** (0.046)
Age 30–59 × % MPs under 40	0.195*** (0.022)	0.196*** (0.022)
Observations	173072	173072
ESS Round FE	Yes	Yes
Random intercepts	Country + country-election	Country + country-election
Random slope	Yes	Yes

Entries are logit coefficients with standard errors in parentheses. ESS round fixed effects included (omitted from display). Survey weights applied. Random intercepts for country and country-election.

APPENDIX 4

Table A4.1. Alternative operationalization of substantive representation (medium indices)

	Model 13.1	Model 13.2
Aged 18–29 (ref: 60+)	-1.220*** (0.040)	-1.189*** (0.040)
Aged 30–59 (ref: 60+)	-0.616*** (0.019)	-0.584*** (0.019)
Female	0.165*** (0.015)	0.165*** (0.015)
Education: < Lower secondary	-0.277*** (0.027)	-0.274*** (0.027)
Education: Lower secondary	-0.337*** (0.020)	-0.336*** (0.020)
Education: Post-secondary non-tertiary	0.171*** (0.038)	0.178*** (0.038)
Education: Tertiary	0.231*** (0.021)	0.231*** (0.021)
Household income	0.240*** (0.008)	0.240*** (0.008)
Close to party	0.904*** (0.016)	0.902*** (0.016)
Political interest: Not at all	-1.408*** (0.033)	-1.410*** (0.033)
Political interest: Hardly	-0.822*** (0.030)	-0.823*** (0.030)
Political interest: Quite	-0.226*** (0.030)	-0.227*** (0.030)
Political trust	0.157*** (0.009)	0.158*** (0.009)
Postmaterial attitudes	0.019* (0.008)	0.020** (0.008)
% MPs under 30	-0.016 (0.026)	-0.002 (0.026)
Postmaterialist salience		0.070** (0.027)
Materialist salience	0.012 (0.026)	
Compulsory voting	0.554*** (0.138)	0.604*** (0.141)
Electoral system: Majoritarian	-0.458 (0.361)	-0.466 (0.333)
Electoral system: Mixed	-0.146 (0.097)	-0.124 (0.100)
Age 18–29 × Postmaterialist salience (medium)		-0.027 (0.038)
Age 30–59 × Postmaterialist salience (medium)		-0.062*** (0.015)
Age 18–29 × Materialist salience (medium)	-0.131*** (0.039)	
Age 30–59 × Materialist salience (medium)	-0.101*** (0.020)	
Observations	173072	173072
ESS Round FE	Yes	Yes
Random intercepts	Country + country-election	Country + country-election
Random slope	Yes	Yes

Entries are logit coefficients with standard errors in parentheses.

ESS round fixed effects included (omitted from display).

Survey weights applied.

Random intercepts for country and country-election.

Table A4.2. Operationalization logic for the substantive representation: Postmaterialist index

Size of postmaterialist indices	Composition	Advantages	Disadvantages
Narrow	Individual freedoms and civil rights	Very clean, good explanatory power and low risk of conceptual drift	High party-level noise, potential sensitivity to manifesto length and style, less stable across countries and years
Medium	Individual freedoms and civil rights, democratic principles, equality and inclusion and multiculturalism (positive)	Higher reliability at the party level, better behaved distribution at election level, stronger leverage in interactions with age, more comparable cross-nationally	Broader meaning and higher risk of conceptual drift

Table A4.3. Operationalization logic for the substantive representation: Materialist index

Size of materialist indices	Composition	Advantages	Disadvantages
Narrow	Education expansion and labour market integration	Very strong face validity, less risk of over-inclusion and stronger link to turnout calculations	Misses symbolic inclusion and thin signal when aggregated
Medium	Education expansion and labour market integration, and needs of non-economic demographic groups (including youth, women, and others).	More variance at election level, better cross-national comparability and less sensitivity to single CMP categories	Broader meaning and higher risk of conceptual drift

APPENDIX 5**Table A5.** Alternative age categorization (young as 18–34 and middle-aged 35–59)

	Model 14.1	Model 14.2
Aged 18–34 (ref: 60+)	-1.054*** (0.033)	-1.056*** (0.034)
Aged 35–59 (ref: 60+)	-0.460*** (0.021)	-0.467*** (0.020)
Female	0.163*** (0.015)	0.163*** (0.015)
Education: < Lower secondary	-0.323*** (0.027)	-0.323*** (0.027)
Education: Lower secondary	-0.346*** (0.020)	-0.345*** (0.020)
Education: Post-secondary non-tertiary	0.172*** (0.038)	0.172*** (0.038)
Education: Tertiary	0.265*** (0.021)	0.266*** (0.021)
Household income	0.238*** (0.008)	0.238*** (0.008)
Close to party	0.900*** (0.016)	0.901*** (0.016)
Political interest: Not at all	-1.396*** (0.033)	-1.396*** (0.033)
Political interest: Hardly	-0.813*** (0.030)	-0.813*** (0.030)
Political interest: Quite	-0.225*** (0.030)	-0.225*** (0.030)
Political trust	0.157*** (0.009)	0.157*** (0.009)
Postmaterial attitudes	0.015 (0.008)	0.015 (0.008)
% MPs under 30	-0.228*** (0.031)	-0.233*** (0.030)
Postmaterialist salience	0.020 (0.027)	
Materialist salience		-0.020 (0.026)
Compulsory voting	0.618*** (0.141)	0.542*** (0.140)
Electoral system: Majoritarian	-0.432 (0.330)	-0.452 (0.353)
Electoral system: Mixed	-0.113 (0.099)	-0.137 (0.097)
Age 18–34 × % MPs under 30	0.362*** (0.036)	0.354*** (0.038)
Age 35–59 × % MPs under 30	0.241*** (0.024)	0.233*** (0.024)
Age 18–34 × Postmaterialist salience	0.068* (0.032)	
Age 35–59 × Postmaterialist salience	-0.003 (0.017)	
Age 18–34 × Materialist salience		-0.046 (0.034)
Age 35–59 × Materialist salience		-0.029 (0.021)
Observations	173072	173072
ESS Round FE	Yes	Yes
Random intercepts	Country + country-election	Country + country-election
Random slope	Yes	Yes

Entries are logit coefficients with standard errors in parentheses.

ESS round fixed effects included (omitted from display). Survey weights applied. Random intercepts for country and country-election.

Model 14.1

Model 14.2

APPENDIX 6

Table A6.1. Robustness to alternative random-effects structures

	Model 15.1	Model 15.2	Model 15.3	Model 15.4
Aged 18–29 (ref: 60+)	-1.090*** (0.025)	-1.047*** (0.025)	-1.161*** (0.050)	-1.158*** (0.050)
Aged 30–59 (ref: 60+)	-0.514*** (0.020)	-0.518*** (0.020)	-0.546*** (0.035)	-0.558*** (0.035)
Female	0.162*** (0.015)	0.162*** (0.015)	0.167*** (0.015)	0.168*** (0.015)
Education: < Lower secondary	-0.266*** (0.026)	-0.259*** (0.026)	-0.320*** (0.027)	-0.320*** (0.027)
Education: Lower secondary	-0.343*** (0.020)	-0.337*** (0.020)	-0.323*** (0.021)	-0.322*** (0.021)
Education: Post-secondary non-tertiary	0.170*** (0.038)	0.178*** (0.038)	0.159*** (0.038)	0.159*** (0.038)
Education: Tertiary	0.223*** (0.021)	0.223*** (0.021)	0.244*** (0.021)	0.244*** (0.021)
Household income	0.242*** (0.008)	0.243*** (0.008)	0.245*** (0.008)	0.245*** (0.008)
Close to party	0.904*** (0.016)	0.904*** (0.016)	0.903*** (0.016)	0.904*** (0.016)
Political interest: Not at all	-1.394*** (0.033)	-1.393*** (0.033)	-1.405*** (0.033)	-1.406*** (0.033)
Political interest: Hardly	-0.815*** (0.030)	-0.813*** (0.030)	-0.824*** (0.030)	-0.824*** (0.030)
Political interest: Quite	-0.223*** (0.030)	-0.222*** (0.030)	-0.228*** (0.030)	-0.228*** (0.030)
Political trust	0.157*** (0.009)	0.158*** (0.009)	0.159*** (0.009)	0.158*** (0.009)
Postmaterial attitudes	0.016* (0.008)	0.017* (0.008)	0.017* (0.008)	0.017* (0.008)
% MPs under 30	-0.263*** (0.030)	-0.269*** (0.030)	-0.129*** (0.038)	-0.143*** (0.038)
Postmaterialist salience	0.012 (0.027)		0.037 (0.036)	
Materialist salience		-0.029 (0.026)		-0.016 (0.034)
Compulsory voting	0.622*** (0.138)	0.537*** (0.137)	0.612*** (0.142)	0.543*** (0.141)
Electoral system: Majoritarian	-0.500 (0.326)	-0.518 (0.351)	-0.435 (0.329)	-0.455 (0.351)
Electoral system: Mixed	-0.116 (0.097)	-0.144 (0.096)	-0.125 (0.102)	-0.149 (0.100)
Age 18–29 × % MPs under 30	0.470*** (0.030)	0.481*** (0.030)	0.226*** (0.052)	0.232*** (0.054)
Age 30–59 × % MPs under 30	0.288*** (0.023)	0.273*** (0.023)	0.151*** (0.038)	0.153*** (0.039)
Age 18–29 × Postmaterialist salience	0.099*** (0.020)		0.043 (0.051)	
Age 30–59 × Postmaterialist salience	0.019 (0.017)		-0.017 (0.035)	
Age 18–29 × Materialist salience		0.035 (0.026)		-0.022 (0.050)
Age 30–59 × Materialist salience		-0.049* (0.020)		-0.041 (0.035)
Observations	173072	173072	173072	173072
ESS Round FE	Yes	Yes	Yes	Yes
Random intercepts	Country + country-election	Country + country-election	Country + country-election	Country + country-election

	Model 15.1	Model 15.2	Model 15.3	Model 15.4
Random slope	No	No	Yes	Yes
RE correlation allowed	—	—	No ()	No ()

Entries are logit coefficients with standard errors in parentheses.

ESS round fixed effects included (omitted from display).

Survey weights applied.

This table varies the random-effects structure as a robustness check.

Table A6.2. Types of random structures covered in the paper and their meanings

Random slope models	Variations	Meanings for the age gap
No slope (Model 15.1 and 15.2)	Only baseline turnout	Understates cross-national heterogeneity in age gaps, might inflate significance of cross-level interactions
One slope for youth (Main model 1-10)	Youth penalty	Acknowledges that the age gap exists at the country-election level and allows institutions explain why it is larger or smaller
Two slopes (Model 15.3 and 15.4)	Youth and middle aged citizens	Dilutes the meaning of the age gap, over-parametrizes and complicates interpretation of interactions