

Supplementary Information to “Birth Order and Voter Turnout”

1 Details on Data and Measures for the Norwegian and Swedish Samples

This section provides a description of the data availability, data sources and variables used for the paper “Birth Order and Voter Turnout.”

1.1 Data Availability and additional institutional context

In both countries, the elections for national parliament constitute first-order elections where turnout is very high, typically between 80 and 90 percent, whereas the two remaining elections represent second-order elections with considerably lower turnout rates.

Both Norway and Sweden have proportional multi-party systems. Voter registration is automatic in both countries, and citizens aged 18 or more are eligible to vote in all elections.¹

1.1.1 Norway

The individual records used in the analysis are drawn from Norwegian administrative registers. The data are on loan to the Frisch Centre as part of the project “Who votes and why?” Data are stored on an encrypted server at the Centre and we are not allowed to share data with others.

¹In addition, non-citizens who have been a resident for at least three years are allowed to vote in the local elections in both Norway and Sweden.

Statistics Norway provides microdata for research projects, and has data relating to persons, establishments and enterprises, including those used in this study. The step-by-step procedure for obtaining micro data is described at <https://www.ssb.no/en/omssb/tjenester-og-verktoy/data-til-forskning>. We will also make available a complete list of the variables that we ordered from Statistics Norway for this project.

The important steps for access are:

1. Researchers can gain access to the data by submitting a written application to Statistics Norway.
2. Data access is given to researchers affiliated with an officially approved research institution/university, based on application.
3. For the data used in the present study, a recommendation from the institution's Data Protection Officer based on a DPIA according to the EU GDPR requirements, is needed before the application can be submitted. There is no need for permits from the Regional Committees for Medical and Health Research Ethics (REC) or from The Norwegian Data Protection Authority as all data sources are supplied by Statistics Norway and access will be granted by Statistics Norway directly.
4. In order to be able to submit the data access application, the project must be approved and have a project description. The application should include a detailed research proposal describing the goals and methods of the project, a detailed list of variables, the selection criteria to be used, and how the research will be funded.
5. The application form and attachments should be submitted to mikrodata@ssb.no

1.1.2 Sweden

For the analyses of the Swedish elections, we use individual level information obtained from various administrative registers. The data are stored on an encrypted server and all our analysis have been conducted through a remote desktop application. We are under contractual obligation not to disseminate these data to other individuals.

For interested researchers it is, however, possible to order the data used for these analyses directly from Statistics Sweden. Currently, Statistics Sweden require that researchers obtain a permission from a Swedish Ethical Review Board before data can be ordered (a description, in Swedish, of how to order data from Statistics Sweden is available at: <https://www.scb.se/en/services/guidance-for-researchers-and-universities/>). We will also make available a complete list of the variables that we ordered from Statistics Sweden for this project.

1.2 Variables and Data Sources

1.2.1 Norway

Turnout Local — Equal to 1 if the individual voted in the 2015 local elections, 0 otherwise, if eligible to vote. The information is retrieved from digitized voter files.

Turnout General — Equal to 1 if the individual voted in the 2013 parliamentary election, 0 otherwise, if eligible to vote. The information is retrieved from digitized voter files.

Birth Order — Birth order on the maternal side. Information is constructed from birth year/month and mother's personal identification number, based on records from the Central Population Register.

Family Size — Number of siblings on the maternal side (by 2017). Information is constructed from mother's personal identification number, based on records from the Central Population Register.

Female — Equal to 1 if female. Information is retrieved from the Central Population Register.

Birth Year — Information is retrieved from the Central Population Register.

Educational Attainment — Educational attainment is measured according to the five-digit Norwegian standard classification of educational level (NUS 2000), which corresponds to the ISCED 97 levels of education categories. To each code, Statistics Norway has

assigned the statutory years of schooling, ranging from zero (no education) to 22 (certain PhD programs). In the empirical analyses, we use the cohort-specific percentile rank of years of schooling as our measure of educational attainment in Figure 3 in the main text, while the outcome in Table A1 is completed college education and the sample split in Table A9 is based on whether the parents have (some) college education.

Earnings — The administrative tax register contains information on gross earnings (wages and self-employment income plus earnings-related transfers such as unemployment benefits and sick-leave payments; “pensjonsgivende inntekt”). In the empirical analyses, we use the cohort-specific percentile rank of average earnings over the three calendar years prior to each election.

1.2.2 Sweden

Turnout EP — Equal to 1 if the individual voted in the Swedish European Parliament election in 2009. The information is retrieved from scanned election rolls.

Turnout General — Equal to 1 if the individual voted in the Swedish general election in 2010. The information is retrieved from scanned election rolls.

Birth Order — Birth order on the maternal side. Information is retrieved from the Multi-Generation Registry.

Family Size — Number of siblings on the maternal side. Information is retrieved from the Multi-Generation Registry.

Female — Equal to 1 if female. Information is retrieved from the Swedish Population Register.

Birth Year — Information is retrieved from the Swedish Population Register.

Educational Attainment — Educational attainment is measured according to the first digit in the three-digit Swedish standard classification of educational level (SUN 2000) which corresponds to the single digit ISCED 97 levels of education categories: 1) primary education or first stage of basic education; 2) lower secondary education or second stage of

basic education; 3) upper secondary education; 4) post-secondary non-tertiary education; 5) first stage of tertiary education; 6) second stage of tertiary education. Following the manual for classifying educational programmes in OECD countries (ISCED-97), we converted the three-digit Swedish standard classification to the following years of schooling to variable: (old) primary school (7); (new) compulsory school (9); (old) junior secondary education (9.5); high school (10-12 depending on the program); short university (13); longer university (14-16 depending on the program); short post-graduate (17); long post-graduate (19). In the empirical analyses, we use the cohort-specific percentile rank of years of schooling as our measure of educational attainment in Figure 3 in the main text, while the outcome in Table A1 is completed college education and the sample split in Table A9 is based on whether the parents have (some) college education. For the children the information on educational attainment is retrieved from the 2009 and 2010 waves of the Longitudinal integration database for health insurance and labour market studies (LISA by Swedish acronym) depending on the outcome in focus (the 2009 EP election or the 2010 general election). For the parents the information is retrieved from the 1970 census and the 1990 wave of LISA.

Earnings — Gross total wage income as reported by the employer to the tax authorities. We use a cohort-specific percentile rank of earnings in the empirical models. In the empirical analyses, we use the cohort-specific percentile rank of average earnings over the three calendar years prior to each election. The information on earnings is retrieved from the 2006, 2007, 2008 and 2009 waves of the Longitudinal integration database for health insurance and labour market studies (LISA by Swedish acronym).

2 Details on Data and Measures for the Non-Nordic Samples

In this Appendix, we present results from five further samples. This section provides a description of these data sources and the variables used in the analyses.

2.1 NLSY (US)

The National Longitudinal Survey of Youth 1979 (NLSY79) is a nationally representative sample of around 13,000 young men and women who were 14 to 22 years old when they were first surveyed in 1979. These individuals are known as NLSY79 respondents. The children born to the women in the original NLSY79 have also been repeatedly surveyed beginning in 1986. In 2006 and 2008, a sample of these children were asked about their participation in the 2004 election. Moreover, the survey included several items on different attitudinal factors such as political interest, political efficacy, and civic duty. We use these data to estimate birth order effects for the NLSY children. We use the following outcome variables in the NLSY sample:

Turnout — Equal to 1 if the individual reported voting in the 2004 presidential election. The variable is constructed from responses to the following question in the 2006:

In talking to people about elections, we often find that a lot of people were not able to vote because they were sick or they just didn't have time or for some other reason. Which of the following statements best describes you: One, I did not vote in the 2004 U.S. presidential election. Two, I thought about voting in the 2004 U.S. presidential election, but didn't. Three, I usually vote, but didn't vote in the 2004 U.S. presidential election. Or four, I am sure I voted in the 2004 U.S. presidential election.

Political Interest — 0-10 scale in which higher numbers denote more political interest. The variable is constructed from responses to the following question in the 2008 survey:

How interested are you in information about what's going on in government and politics? Extremely interested, very interested, moderately interested, slightly interested, or not interested at all?

Internal Political Efficacy — 0-10 scale in which higher numbers denote higher internal political efficacy. The variable is constructed as an average from responses to the following question in the 2006 and 2008 surveys:

How often is politics so complicated that you don't really understand what's going on?

Always, most of the time, about half the time, once in a while, or never?

External Political Efficacy — 0-10 scale in which higher numbers denote higher external political efficacy. The variable is constructed as an average from responses to the following question in the 2006 and 2008 surveys:

How often does the federal government do what most Americans want it to do? Always, most of the time, about half the time, once in a while, or never?

Civic Duty — 0-10 scale in which higher numbers denote higher levels of civic duty. The variable is constructed from responses to the following question in the 2008 survey:

Generally speaking, do you believe that you have a duty to vote in every national election, or do you believe that you do not have a duty to vote in every national election?

2.2 Add Health (US)

The National Longitudinal Study of Adolescent to Adult Health (Add Health) is a longitudinal study of a nationally representative sample of adolescents in grades 7-12 in the United States during the 1994-95 school year. The Add Health cohort has been followed into young adulthood with five in-home interviews, the most recent in 2016-2018, when the sample was aged 32-42. In the analyses in this Appendix we use data from the third wave (2001-2002) to estimate birth order effects for the Add Health participants. We use the following outcome variable in the Add Health sample:

Turnout — Equal to 1 if the individual reported voting in the 2000 presidential election. The variable is constructed from responses to the following question:

Did you vote in the most recent presidential election?

2.3 BHPS (UK)

The British Household Panel Survey (BHPS) began in 1991 and was designed as an annual survey of each adult (16+) member of a nationally representative sample of about 5,500 households (including 10,300 adult members in 1991) drawn from 250 areas of Great

Britain. BHPS has followed this representative sample of individuals over a period of years. As younger household members turn 16 they are also included in the sample. Our estimation sample is constructed from information in the 1991-2008 surveys. The estimation sample is based on children in families in which the parents are young enough at the survey occasion to make it unlikely that they have older children that have left the household and therefore are not included BHPS sample. We use the following outcome variables in the BHPS sample:

Turnout — Equal to 1 if the individual reported voting in response at any occasion during the survey period 1992-2008. The variable is constructed from responses to the following questions in the 1992, 1995, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008 surveys:

Did you vote in the [year] general election?

Political Interest — 0-10 scale in which higher numbers denote more political interest. The variable is constructed as an average from responses to the following question in the 1991, 1992, 1993, 1994, 1995, 1996, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, and 2008 surveys:

How interested would you say you are in politics? Would you say you are very interested, fairly interested, not very interested, or not at all interested?

External Political Efficacy — 0-10 scale in which higher numbers denote higher external political efficacy. The variable is constructed as an average from responses to the following question in the 1992, 1994, 1996, 1998, 2001, 2003, and 2006 surveys:

Ordinary people don't really have a chance to influence what governments do. [Response alternatives: strongly agree; agree; neither agree nor disagree; disagree; strongly disagree.]

2.4 SOEP (Germany)

The German Socio-Economic Panel (SOEP) is a longitudinal survey of approximately 11,000 private households (including around 30,000 individuals) in the Federal Republic

of Germany from 1984 and the eastern German länder from 1990. Our estimation sample is constructed from information in the 1984-2013 surveys. The estimation sample is based on children in families in which the parents are young enough at the survey occasion to make it unlikely that they have older children that have left the household and therefore are not included SOEP sample. We use the following outcome variables in the SOEP sample:

Turnout — 0-1 scale in which higher values denote higher likelihood of intended and actual voting in parliamentary elections. The variable is constructed as an average from responses to the following question in the 2010 survey:

Did you vote in the last German parliamentary election on September 27, 2009?

and the following questions in the 2005 and 2009 surveys:

Do you intend to vote in the upcoming election on Sunday? [Response alternatives: in any case; probably; possibly; probably not; in no case.]

Political Interest — 0-10 scale in which higher numbers denote more political interest. The variable is constructed as an average from responses to the following question in the 29 surveys fielded between 1985 and 2013:

Generally speaking, how interested are you in politics? [Response alternatives: very interested; interested; not so interested; not at all interested.]

Civic Duty — 0-10 scale in which higher numbers denote higher levels of civic duty. The variable is constructed as an average from responses to the following question in the 1990, 1992, 1995, 2004, 2007, and 2012 surveys:

Different things in life are important to different people. Are the following things for you personally today very important, important, less important, or totally unimportant? [To be politically and socially engaged.]

2.5 SHP (Switzerland)

The Swiss Household Panel (SHP) is a longitudinal survey that started in 1999 with a sample of 5,074 households containing 12,931 household members. In 2004 a second sample of 2,538 households with a total of 6,569 household members was added. Since 2013 the SHP contains a third sample of 4,093 households with 9,945 individuals. Our estimation sample is constructed from information from the first two SHP samples in the 1999-2013 surveys. The estimation sample is based on children in families in which the parents are young enough at the survey occasion to make it unlikely that they have older children that have left the household and therefore are not included SHP sample. We use the following outcome variables in the SHP sample:

Turnout — 0-1 scale in which higher values denote higher likelihood of intended voting in federal polls. The variable is constructed as an average from responses to the following questions in the 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, and 2011 surveys:

Let's suppose that there are 10 federal polls in a year. How many do you usually take part in?

Political Interest — 0-10 scale in which higher numbers denote more political interest. The variable is constructed as an average from responses to the following question in the 14 surveys fielded between 1999 and 2012:

Generally, how interested are you in politics, if 0 means "not at all interested" and 10 "very interested"?

External Political Efficacy — 0-10 scale in which higher numbers denote higher external political efficacy. The variable is constructed as an average from responses to the following question in the 14 surveys fielded between 1999 and 2012:

How much influence do you think someone like you can have on government policy, if 0 means "no influence", and 10 "a very strong of influence"?

3 Auxiliary Results and Robustness Checks

In this section we provide some details on the auxiliary results and robustness checks briefly discussed in the main text. Table A1 present within-family estimates of the effect of having a college degree on turnout in the four Norwegian and Swedish elections. As expected, college education is strongly associated with voter turnout. Moreover, similar to the results for the relationship between birth order and turnout, the estimates suggest that the influence of college education is stronger in lower turnout elections.

Table A2 provides estimates of turnout differentials with respect to birth order separately for males and females. In three out of four elections (Norway 2013 and 2015 and Sweden 2010), the influence of birth order is slightly stronger among females. The main impression, though, is one of similar patterns of estimates across males and females. Thus, we find no strong evidence of heterogeneity across gender.

In Table A3, we present average marginal effects based on conditional logit models with family fixed effects. The average marginal effects are averages of separate calculations based on the logit estimates of the effect of changing birth order status on the probability of voting for each individual in the sample. These marginal effects are slightly larger in magnitude in comparison to the estimates from the linear probability models shown in Table 1 in the main text. However, the overall pattern of results is very much in line with the estimates presented in the main text. Thus, the conditional logit results show that the likelihood of voting is monotonically and strongly decreasing in birth order.

In our main analysis, we restrict the estimation samples to individuals who themselves and whose siblings are all aged 20-65 at the time of the elections. In Table A4, we present results from models based on estimation samples without these age restrictions. Once again, the estimates from these models are very similar to the ones we report in Table 1 in the main text.

In Table A5 we restrict the samples to children of parents who have never divorced. The results are very close to the corresponding estimates presented in Table 1 in the main text.

Tables A6 and A7 report results by family size. In both countries, the point estimates for the larger families are somewhat weaker than the corresponding estimates in the smaller families. However, the estimates are quite imprecise for the larger families with fewer observations. Still, the pattern of estimates in which the negative relationship increases monotonically for higher birth orders is evident in all but the smallest sample (five sibling families in Norway 2013). Thus, we conclude that the magnitudes of the turnout differentials seem to be similar in families of different sizes.

In Table A8 we test whether the birth order effect is conditional on the age difference between the siblings. In order to keep this analysis simple, we restrict the sample to two-sibling families and compare effect sizes for sibling pairs born 0-3 years apart to sibling pairs more than three years apart (where three years roughly corresponds to the median age difference between siblings in two-sibling families in both Norway and Sweden). Across all elections, the birth order estimates are somewhat stronger the larger the age difference between the siblings, especially in Sweden. However, only in one case - the 2010 national election in Sweden - is the difference in effect size across the two groups statistically significant ($p = 0.002$).

Finally, Table A9 displays results from a simple heterogeneity analysis in which we examine whether parental socioeconomic status (SES) moderates the birth order effects. To capture parental SES, we distinguish between families in which both parents have some (but not necessarily complete) college education and families in which none or just one of the parents have proceeded to post-secondary education. The estimates indicate that the effects of birth order on voter turnout are slightly stronger among low SES families, with the EU election in Sweden as a partial exception. The p -values from tests of the joint significance of the difference in coefficient size across low and high parental education are equal to 0.010 (Norway 2013), 0.018 (Norway 2015), 0.025 (Sweden 2010) and 0.876 (Sweden 2009).

Table A1: College education and turnout, within family estimates

	Norway		Sweden	
	2013	2015	2009	2010
College	0.095*** (0.002)	0.132*** (0.002)	0.149*** (0.001)	0.052*** (0.001)
Turnout	0.85	0.67	0.47	0.90
Observations	303,797	530,326	2,376,479	2,471,927

Notes: All models include controls for gender, birth year and family (mother) fixed effects. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A2: Birth order and turnout, by gender

Panel A: Norway				
	Norway 2013		Norway 2015	
	Women	Men	Women	Men
Second child	-0.020*** (0.004)	-0.018*** (0.004)	-0.035*** (0.004)	-0.032*** (0.004)
Third child	-0.035*** (0.007)	-0.024*** (0.007)	-0.061*** (0.007)	-0.045*** (0.007)
Fourth child	-0.042*** (0.011)	-0.033*** (0.011)	-0.072*** (0.010)	-0.068*** (0.010)
Fifth child	-0.074*** (0.018)	-0.053*** (0.018)	-0.120*** (0.016)	-0.086*** (0.017)
Turnout	0.86	0.83	0.69	0.64
Observations	86,583	93,719	154,841	164,031

Panel B: Sweden				
	Sweden 2009		Sweden 2010	
	Women	Men	Women	Men
Second child	-0.038*** (0.002)	-0.046*** (0.002)	-0.012*** (0.001)	-0.012*** (0.001)
Third child	-0.057*** (0.003)	-0.064*** (0.003)	-0.020*** (0.002)	-0.016*** (0.002)
Fourth child	-0.079*** (0.005)	-0.081*** (0.005)	-0.028*** (0.003)	-0.021*** (0.004)
Fifth child	-0.099*** (0.008)	-0.099*** (0.008)	-0.046*** (0.005)	-0.027*** (0.006)
Turnout	0.47	0.44	0.90	0.87
Observations	740,010	806,665	771,776	837,362

Notes: All models include controls for gender and birth year fixed effects as well as family (mother) fixed effects. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A3: Birth order and turnout, average marginal effects after conditional logit estimations with family fixed effects

	Norway		Sweden	
	2013	2015	2009	2010
Second child	-0.046*** (0.005)	-0.050*** (0.003)	-0.054*** (0.001)	-0.037*** (0.002)
Third child	-0.068*** (0.008)	-0.076*** (0.005)	-0.080*** (0.002)	-0.054*** (0.003)
Fourth child	-0.084*** (0.013)	-0.100*** (0.008)	-0.104*** (0.003)	-0.067*** (0.005)
Fifth child	-0.130*** (0.021)	-0.150*** (0.013)	-0.128*** (0.005)	-0.086*** (0.008)
Observations	80,068	225,313	1,280,756	589,232

Notes: All models include controls for gender and birth year fixed effects as well as family (mother) fixed effects. The estimates display marginal effects of discrete changes in birth order on the probability of voting over the response surface. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A4: Birth order and turnout without age restrictions

	Norway		Sweden	
	2013	2015	2009	2010
Second child	-0.019*** (0.002)	-0.032*** (0.002)	-0.043*** (0.001)	-0.013*** (0.001)
Third child	-0.026*** (0.003)	-0.048*** (0.003)	-0.063*** (0.002)	-0.018*** (0.001)
Fourth child	-0.036*** (0.005)	-0.063*** (0.005)	-0.081*** (0.002)	-0.025*** (0.002)
Fifth child	-0.047*** (0.009)	-0.090*** (0.008)	-0.098*** (0.004)	-0.033*** (0.002)
Turnout	0.84	0.67	0.47	0.89
Observations	383,868	684,015	3,332,796	3,806,957

Notes: All models include controls for gender, birth year and family (mother) fixed effects. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A5: Birth order and turnout in never divorced families

	Norway		Sweden	
	2013	2015	2009	2010
Second child	-0.017*** (0.002)	-0.031*** (0.002)	-0.043*** (0.001)	-0.011*** (0.001)
Third child	-0.022*** (0.004)	-0.046*** (0.004)	-0.061*** (0.002)	-0.013*** (0.001)
Fourth child	-0.028*** (0.007)	-0.061*** (0.006)	-0.081*** (0.004)	-0.018*** (0.002)
Fifth child	-0.056*** (0.011)	-0.095*** (0.011)	-0.094*** (0.006)	-0.025*** (0.004)
Turnout	0.86	0.69	0.49	0.91
Observations	238,536	412,740	1,638,332	1,687,442

Notes: All models include controls for gender and birth year fixed effects as well as family (mother) fixed effects. The samples are restricted to families in which the parents never have divorced each other. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A6: Birth order and turnout by family size in Norway

Panel A: Norway 2013				
	2 siblings	3 siblings	4 siblings	5 siblings
Second child	-0.025*** (0.004)	-0.019*** (0.003)	-0.006 (0.005)	0.001 (0.010)
Third child	-	-0.033*** (0.006)	-0.009 (0.008)	0.003 (0.013)
Fourth child	-	-	-0.010 (0.012)	0.016 (0.018)
Fifth child	-	-	-	0.028 (0.025)
Turnout	0.84	0.85	0.84	0.83
Observations	121,644	120,699	47,231	15,457
Panel B: Norway 2015				
	2 siblings	3 siblings	4 siblings	5 siblings
Second child	-0.040*** (0.004)	-0.035*** (0.003)	-0.029*** (0.005)	-0.022** (0.011)
Third child	-	-0.058*** (0.006)	-0.034*** (0.007)	-0.018 (0.013)
Fourth child	-	-	-0.045*** (0.011)	-0.031* (0.018)
Fifth child	-	-	-	-0.061** (0.024)
Turnout	0.66	0.67	0.67	0.66
Observations	219,726	209,663	78,698	23,342

Notes: All models include controls for gender and birth year fixed effects as well as family (mother) fixed effects. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A7: Birth order and turnout by family size in Sweden

Panel A: Sweden 2009				
	2 siblings	3 siblings	4 siblings	5 siblings
Second child	-0.049*** (0.002)	-0.044*** (0.002)	-0.036*** (0.003)	-0.035** (0.005)
Third child	-	-0.068*** (0.003)	-0.054*** (0.004)	-0.041*** (0.006)
Fourth child	-	-	-0.073*** (0.006)	-0.055*** (0.008)
Fifth child	-	-	-	-0.072*** (0.011)
Turnout	0.47	0.46	0.44	0.41
Observations	1,192,192	866,544	321,772	108,217
Panel B: Sweden 2010				
	2 siblings	3 siblings	4 siblings	5 siblings
Second child	-0.013*** (0.001)	-0.012*** (0.001)	-0.011*** (0.002)	-0.008* (0.004)
Third child	-	-0.018*** (0.002)	-0.015*** (0.003)	-0.013** (0.005)
Fourth child	-	-	-0.022*** (0.004)	-0.011 (0.006)
Fifth child	-	-	-	-0.018* (0.008)
Turnout	0.90	0.89	0.88	0.86
Observations	1,251,148	895,684	326,675	107,143

Notes: All models include controls for gender and birth year fixed effects as well as family (mother) fixed effects. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A8: Birth order effects and age differences between siblings

	Norway 2013		Norway 2015	
	0-3 years	>3 years	0-3 years	>3 years
Second child	-0.029*** (0.010)	-0.026*** (0.007)	-0.045*** (0.004)	-0.044*** (0.007)
Turnout	0.85	0.84	0.67	0.66
Observations	60,292	61,352	110,198	109,528
	Sweden 2009		Sweden 2010	
	0-3 years	>3 years	0-3 years	>3 years
Second child	-0.052*** (0.004)	-0.044*** (0.003)	-0.018*** (0.003)	-0.008*** (0.002)
Turnout	0.48	0.46	0.89	0.90
Observations	581,958	610,234	621,954	629,194

Notes: All models include controls for gender and birth year fixed effects as well as family (mother) fixed effects. The samples are restricted to two-sibling families. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A9: Birth order effects and parental education

	Norway 2013		Norway 2015	
	No college	Some college	No college	Some college
Second child	-0.020*** (0.002)	-0.010** (0.004)	-0.037*** (0.002)	-0.021*** (0.005)
Third child	-0.028*** (0.004)	-0.024*** (0.008)	-0.053*** (0.004)	-0.036*** (0.009)
Fourth child	-0.039*** (0.007)	-0.011 (0.013)	-0.070*** (0.006)	-0.047*** (0.014)
Fifth child	-0.056*** (0.011)	-0.048** (0.023)	-0.106*** (0.010)	-0.052** (0.024)
Turnout	0.83	0.91	0.63	0.74
Observations	247,819	54,737	433,101	95,132

	Sweden 2009		Sweden 2010	
	No college	Some college	No college	Some college
Second child	-0.044*** (0.001)	-0.042*** (0.003)	-0.013*** (0.001)	-0.010*** (0.002)
Third child	-0.064*** (0.002)	-0.060*** (0.006)	-0.020*** (0.001)	-0.011*** (0.003)
Fourth child	-0.083*** (0.003)	-0.076*** (0.010)	-0.027*** (0.002)	-0.012*** (0.005)
Fifth child	-0.101*** (0.005)	-0.108*** (0.019)	-0.036*** (0.004)	-0.026*** (0.010)
Turnout	0.44	0.62	0.89	0.92
Observations	2,110,974	263,769	2,108,566	251,698

Notes: All models include controls for gender and birth year fixed effects as well as family (mother) fixed effects. Some college refers to individuals both of whose mothers and fathers have some (but not necessarily complete) college education. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

4 External Validity and Mechanisms

The primary conclusion of the sensitivity checks discussed above is that the baseline estimates from Table 1 in the main text are reasonably robust to changes in model specification and sample restrictions. However, although the estimates appear to be internally valid, a possible weakness to our results is that they may not generalize to other countries and contexts. Norway’s and Sweden’s electorates and political institutions stand out along many dimensions in cross-country comparisons. Considering the fact that all political behavior is embedded in specific institutional environments, it is fair to ask to what degree, if at all, the estimates obtained in our study translate to other contexts.

To explore the external validity of our results, we compare the association between birth order and voter turnout in five samples from four countries: The National Longitudinal Study of Adolescent to Adult Health (Add Health); The National Longitudinal Survey of Youth 1979 (NLSY79); The British Household Panel Survey (BHPS); The German Socio-Economic Panel (SOEP); The Swiss Household Panel (SHP). The sample construction and exact measures used in these studies are discussed above.

The choice of these particular samples is based on both practical and substantial criteria. First, estimation of within-family models requires samples that includes multiple siblings with information on birth order and/or age of all siblings in the family (both those included and not included in the sample). Second, we need information on relevant outcome variables, especially voter turnout, for the individuals in the sample. Third, we have strived for including samples from different national contexts and various electoral systems in order to boost the external validity of our results.

Table A10 presents estimates of first-born premiums on voter turnout in the five samples. Since these samples are much smaller than the Norwegian and Swedish samples employed in the main analyses, we have simplified the models by using a dummy indicator for being first-born (as opposed to later-born) in the analyses presented here. Moreover, we provide results from two different model specifications. In the upper panel we show estimates from between-family models including fixed effects for age and gender. In

the lower panel we report estimates from within-family models including controls for gender and age- and family-fixed effects. For comparison purposes, Table A11 provides corresponding estimates of first-born effects on voter turnout based on the Norwegian and Swedish data.

Several things can be noted from these results. First, as expected, the estimates in these much smaller samples are more imprecise. Nevertheless, the turnout difference between first- and later-borns is consistently positive across all samples and model specifications (with the exception of the between-family estimate from the Swiss sample). Second, similar to what we found in the Norwegian and Swedish samples, there is a tendency for the turnout differential to decrease in magnitude as the level of turnout (shown in brackets) increases. Third, as is evident in both Table A10 and Table A11, there are some noteworthy differences in the magnitudes of the within- and between-family estimates. However, the overall pattern of the results are nevertheless rather similar.

We use the coefficient estimates from the within-family specification to construct Figure 2 in the main text. Yet, for the sake of completeness, we show the corresponding graph based on the between-family estimates below. The tendency for the magnitude of the first-born effect to decrease as the overall turnout rate increases is even more evident in Figure A1.

Four of the non-Nordic samples also include measures of different attitudinal factors shown to predict voter turnout in earlier studies. Based on these measures, Table A10 reports estimates of first-born effects on political interest, internal and external political efficacy, and support for the norm of voting as a civic duty. These outcome variables are measured on 0-10 scales in which higher values denote more of the attribute in question. Once again, and as expected, the estimates, especially in the lower panel, are somewhat imprecise due to the small sample sizes. Still, it is interesting to note that being first-born is positively related to all attitudinal factors. These results are consistent with the notion that the association between birth order and voter turnout is partly mediated by important attitudinal predispositions.

There are at least three possible objections against the results presented in Table A10

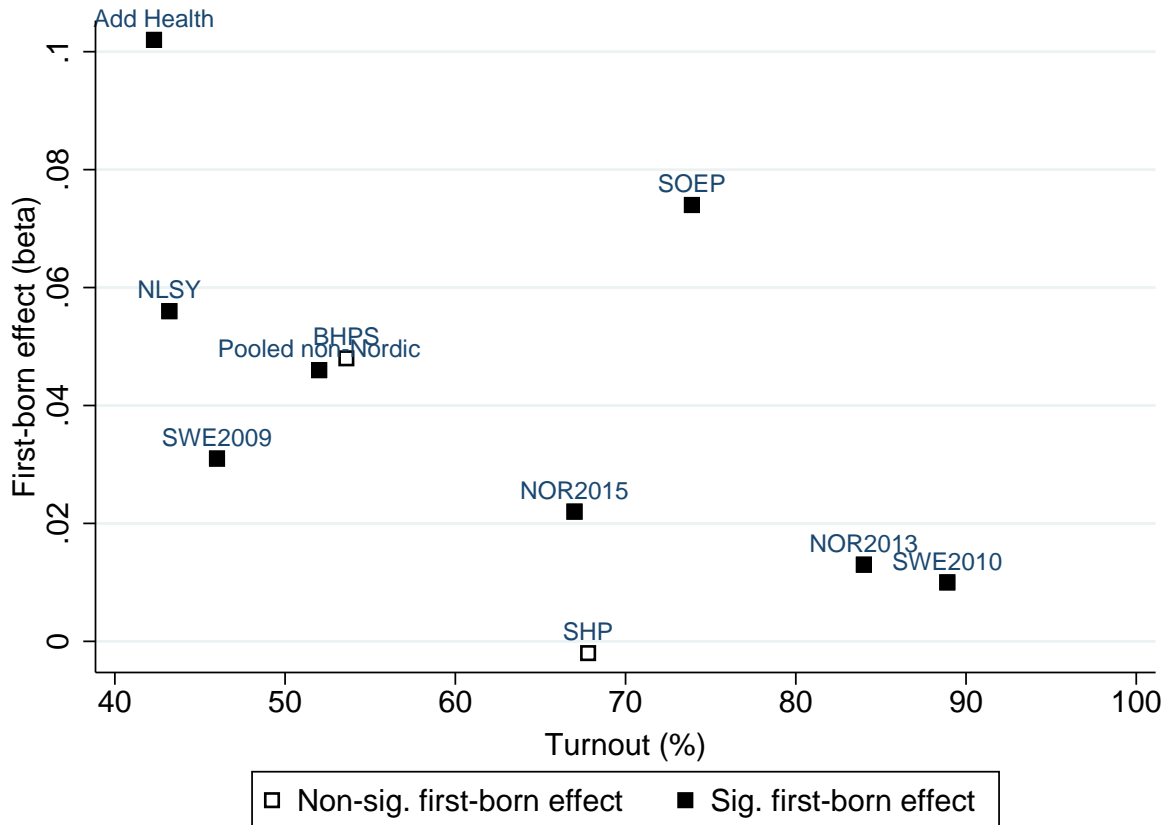


Figure A1: First-born turnout premium in nine samples, between family estimates

in the Appendix and Figure 2 in the main text. First, although positive none of the estimated first-born effects on voter turnout are statistically significant in the five non-Nordic survey samples (at least not at the .05 level). Second, it is not clear that the magnitude of the turnout difference between first- and later-borns decreases as the overall turnout rate increases if restricting the analysis to the five non-Nordic countries. Third, our main reason for reducing birth order to a dummy indicator differentiating first-borns from those born later in these analyses is the loss of precision due to the much smaller sample sizes in the five survey studies. Nevertheless, it is important to check whether the overall pattern of results holds when using the full birth order specification. We examine these issues in column 6 in Table A10 and Tables A12 and A13.

In column 6 in Table A10 we have pooled the five non-Nordic samples. The estimates suggest that the first-born effects on both turnout and the attitudinal predispositions are statistically significant in the pooled sample. In Table A12 we have included an interaction term between the first-born indicator and the average turnout rates in the five

samples. The average turnout rate is demeaned in order to simplify interpretation. As expected the interaction term is negative, implying that the turnout difference between first- and later-borns are lower at higher levels of overall turnout. The interaction effect is substantially large but only statistically significant in the between-family model.

Finally, in Table A13 we display estimates from models including the full birth order specification both separately for each of the five non-Nordic samples (columns 1 through 5) and for all samples pooled (column 6). Two things can be noted here. First, with a few exceptions the overall pattern of coefficients is similar to the one found in the two Nordic countries in the sense that the estimates show that the probability of voting is decreasing in birth order. Second, most of these estimates are very imprecise and some of them, especially in the smallest (SOEP) sample and at higher parities, are implausibly large in magnitude. This is most likely due to the small sample sizes and the limited number of large families included in these samples. Still, the confidence intervals around the coefficients obtained in the pooled sample (average turnout equal to 52%) include the corresponding estimates in the Norwegian 2015 (average turnout 67%) and Swedish 2009 (average turnout 46%) samples.

Table A10: First-born effects on turnout and predispositions in other countries

Panel A: Between-family models						
	AddHealth	NLSY	BHPS	SOEP	SHP	Pooled
Turnout	0.102*** (0.031) [0.423]	0.056** (0.025) [0.432]	0.048 (0.031) [0.536]	0.074** (0.031) [0.739]	−0.004 (0.017) [0.678]	0.046*** (0.012) [0.520]
Pol. interest	— — —	0.195 (0.124) [4.377]	0.496*** (0.123) [2.816]	0.642*** (0.107) [3.137]	0.277*** (0.102) [4.686]	0.339*** (0.059) [3.888]
Int. efficacy	— — —	0.267*** (0.095) [5.401]	— — —	— — —	— — —	0.267*** (0.095) [5.401]
Ext. efficacy	— — —	0.290*** (0.074) [3.276]	0.098 (0.112) [4.033]	— — —	0.248*** (0.093) [3.665]	0.232*** (0.051) [3.518]
Duty	— — —	0.507*** (0.188) [7.539]	— — —	0.343** (0.153) [3.423]	— — —	0.472*** (0.145) [6.492]
Panel B: Within family models						
	AddHealth	NLSY	BHPS	SOEP	SHP	Pooled
Turnout	0.061 (0.038) [0.423]	0.013 (0.032) [0.432]	0.077* (0.043) [0.536]	0.064* (0.038) [0.739]	0.025 (0.020) [0.678]	0.050*** (0.015) [0.520]
Pol. interest	— — —	0.200 (0.169) [4.377]	0.363** (0.167) [2.816]	0.605*** (0.114) [3.137]	0.330*** (0.123) [4.686]	0.404*** (0.071) [3.888]
Int. efficacy	— — —	0.333** (0.135) [5.401]	— — —	— — —	— — —	0.333** (0.135) [5.401]
Ext. efficacy	— — —	0.205* (0.106) [3.276]	−0.030 (0.162) [4.033]	— — —	0.418*** (0.127) [3.665]	0.217*** (0.072) [3.518]
Duty	— — —	0.406 (0.256) [7.539]	— — —	0.422** (0.176) [3.423]	— — —	0.444** (0.178) [6.492]
Observations	1,464	2,047–3,876	973–1,434	521–1,373	1,253–2,083	3,564–7,635

Notes: All models include controls for gender and birth year fixed effects. In addition the models in Panel B includes family (mother) fixed effects. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level. Sample means for the outcomes are presented in brackets.

Table A11: First-born effects on turnout in Norway and Sweden

Panel A: Between-family models				
	Norway		Sweden	
	2013	2015	2009	2010
First-born	0.013*** (0.001)	0.022*** (0.001)	0.031*** (0.001)	0.010*** (0.000)
Turnout	0.84	0.67	0.46	0.89
Observations	305,031	532,429	2,628,858	2,692,280

Panel B: Within-family models				
	Norway		Sweden	
	2013	2015	2009	2010
First-born	0.014*** (0.002)	0.027*** (0.002)	0.036*** (0.001)	0.010*** (0.001)
Turnout	0.84	0.67	0.46	0.89
Observations	305,031	532,429	2,628,858	2,692,280

Notes: All models include controls for gender and birth year fixed effects. In addition the models in Panel B includes family (mother) fixed effects. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A12: Conditional first-born effects on turnout in other countries - pooled sample

	Between-family model Pooled	Within-family model Pooled
First-born	0.047*** (0.012)	0.050*** (0.015)
First-born × Average turnout	-0.214** (0.083)	-0.101 (0.089)
Observations	6,407	6,407

Notes: All models include controls for gender, birth year fixed effects, fixed effects for country sample and family (mother) fixed effects. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.

Table A13: Birth order effects on turnout in other countries

Panel A: Between-family models						
	Add Health	NLSY	BHPS	SOEP	SHP	Pooled
Second child	-0.103*** (0.031)	-0.032 (0.025)	-0.056* (0.033)	-0.059** (0.030)	0.001 (0.018)	-0.039*** (0.012)
Third child	-0.102** (0.042)	-0.097*** (0.036)	-0.023 (0.048)	-0.059 (0.048)	0.018 (0.030)	-0.049*** (0.019)
Fourth child	-0.112* (0.061)	-0.212*** (0.056)	-0.025 (0.081)	-0.215** (0.089)	0.013 (0.105)	-0.109*** (0.032)
Fifth child	-0.054 (0.107)	-0.248** (0.108)	-0.229*** (0.077)	-0.320* (0.121)	0.121** (0.055)	-0.176*** (0.058)
Panel B: Within-family models						
	AddHealth	NLSY	BHPS	SOEP	SHP	Pooled
Second child	-0.061 (0.042)	-0.036 (0.035)	-0.079* (0.047)	-0.090** (0.041)	-0.025 (0.020)	-0.060*** (0.015)
Third child	-0.060 (0.070)	-0.052 (0.061)	-0.053 (0.081)	-0.110 (0.073)	-0.019 (0.036)	-0.068** (0.027)
Fourth child	-0.094 (0.115)	-0.149 (0.092)	-0.056 (0.127)	-0.267** (0.115)	-0.047 (0.102)	-0.156*** (0.046)
Fifth child	-0.001 (0.184)	-0.257** (0.111)	-0.188 (0.188)	-0.281* (0.159)	-0.107 (0.079)	-0.214*** (0.071)
Turnout	0.42	0.43	0.54	0.74	0.68	0.52
Observations	1,464	2,047	973	521	1,253	6,407

Notes: All models include controls for gender, birth year fixed effects, and family (mother) fixed effects. In addition, the model for the pooled sample includes country fixed effects. Standard errors, shown in parentheses, allow for clustering at the family level. ***/**/*, indicates significance at the 1/5/10% level.