

Title

Big brother sees you, but does he rule you? The relationship between birth order and political candidacy.

Short title

Big brother sees you, but does he rule you?

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Abstract

While recent research finds strong evidence that birth order affects outcomes such as education, IQ scores, earnings, and health, the evidence for effects on political outcomes is more limited. Based on population-wide data from Sweden, our within-family estimates show that firstborns are significantly more likely to run for and be elected to political office. In addition, for the males in our sample we test whether a number of potential mechanisms account for the relationship between birth order and political participation. Disconfirming our expectations, the birth order effects are only marginally smaller when controlling for occupational economic status, cognitive ability and leadership skills. Our results suggest that big brother, or for that matter big sister, not only sees us; to a certain extent he or she also rules us.

Keywords

birth order; political candidacy; register data; Sweden

Online appendix

Supplementary material for this article is available in the appendix in the online edition.

Data and replication materials

Stata do-files to create the data and reproduce the numerical results in the article are available in the JOP Data Archive on Dataverse (<https://dataverse.harvard.edu/dataverse/jop>).

Research involving human participants

All of the authors' data collection was conducted in compliance with relevant laws and was approved by the regional ethical approval board at Uppsala University.

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Introduction

What motivates citizens to run for office? Previous research has identified the importance of structural conditions, such as the number of open seats or the partisan composition of the electorate (Rohde 1979), as well as personal characteristics of the candidate, such as life experiences as well as cognitive and non-cognitive traits (Dal Bó et al. 2017). Among these factors, family socialization has been shown to be one of the strongest predictors of who becomes a political candidate (Lawless 2011).

While convincingly demonstrating the importance of family socialization, previous research on who becomes a politician has not taken into account that growing up in a specific family can be a different experience for children depending on their birth order.¹ Extant theories posit that birth order influences parent-child and sibling-sibling interactions, suggesting that birth order may affect the political socialization process and thus later political behavior, including the likelihood of running for office. According to the confluence theory, earlier born siblings will be advantaged because the intellectual environment in the family is negatively related to the number of children (Zajonc and Markus 1975). That is, firstborns will spend their first years of life alone with their parents whereas laterborns must also interact with their older siblings which, arguably, compose a less intellectually stimulating environment. The resource dilution theory makes a similar prediction about how birth order affects the cognitive development process, but stresses a different mechanism: the fact that the share of parental attention and resources each laterborn child receives decreases as the size of the family grows (Blake 1981). Finally, according to Sulloway (1996), competition among siblings for parental resources induce children to sort themselves into unique “family niches.” Under this theory, firstborns develop skills and attitudes that allow them to preserve their dominant status in the sibling hierarchy. These skills and attitudes may be relevant for later political engagement.

In addition to impacting the political socialization process within families, birth order may influence political behavior indirectly by shaping traits known to be correlated with running for office (Lawless 2011; Dal Bó et al. 2017). For instance, recent work based on

¹But see Bratsberg et al. (In press) for an accompanying study on voter turnout.

large population registers indicates that birth order is related to things such as educational attainment (Black et al. 2005), occupational status (Black et al. 2018), cognitive ability (Barclay 2015; Rohrer et al. 2015), and certain personality traits (Black et al. 2018). Yet, both the magnitude and generalizability of these birth order effects are still a matter of discussion as not all studies have found birth order to influence the outcomes of interest (e.g., Damian and Roberts 2015; Lejarraga et al. 2019).

To some extent, the variation in the empirical findings of previous birth order studies can be attributed to the methodological challenges associated with this type of research. A problem with much of previous birth order research is that it is based on small samples and compares the outcomes of individuals from different families (between-family design) rather than comparing siblings of different birth order within the same family. As a result, these studies suffer from low statistical power, which makes it difficult to detect subtle birth order effects, and they risk conflating the effect of birth order with that of other confounding variables that vary across families (Rohrer et al. 2015).

Previous research that has sought to establish an empirical link between birth order and elective office holding is subject to similar problems. Typically, scholars have examined the effect of birth order simply by comparing the share of firstborns among politicians to that of a suitable reference population. This type of design has been used to study birth order effects among U.S. presidents (Somit, Peterson, and Arwine 1994), congressmen (Zweigenhaft 1975), and governors (Newman and Taylor 1994). In addition, studies have examined British (Somit, Arwine, and Peterson 1994) and Australian (Newman and Taylor 1994) prime ministers, Dutch local councilors, aldermen, members of parliament and cabinet ministers (Andeweg and Berg 2003), and various national leaders throughout history (Hudson 1990).

Most of these studies purport to find a negative relationship between birth order and the likelihood of holding elective office, but the results have been called into question by other scholars who point to the serious methodological and data limitations plaguing this research (Somit et al. 1996). Of particular importance is the inability of previous studies to separate the influence of birth order from confounding factors like family size

and birth cohort. In this study, we seek to overcome these problems by applying a within-family design to detailed population-wide data from Sweden. Doing so, we found strong support for the view that being a firstborn substantially increases the chances of making a political career. In fact, the effect of birth order is greater than the impact of well-known predictors of political candidacy such as sex and education.

The findings of this study have important theoretical and policy implications. In terms of theory, our study highlights the need for scholars to put greater focus on within-family dynamics in political socialization. For example, Fox and Lawless (2014) find that parental encouragement strongly influences whether children develop an interest in running for office, however, encouragement differs based on the gender of the child. Our results suggest birth order may be another source of heterogeneity. Our findings also have important policy implications since the composition of who runs for office likely has consequences for representation. For example, Carnes and Lupu (2015) show that elected officials from different social classes have different economic policy preferences. However, since legislatures are disproportionately made up of individuals from privileged backgrounds, legislative outcomes tend to be biased in favor of privileged citizens. Along the same lines, biased policymaking may also result in legislatures dominated by first borns. There are, for instance, some recent studies suggesting that firstborn siblings tend to be more politically conservative (Barni et al. 2014; Urbatsch 2014), although some earlier studies have failed to find such an effect (Freese et al. 1999; Følrand et al. 2012).

Data and Empirical Framework

To study the importance of birth order on elite political participation we use administrative data from Statistics Sweden on all nominated and elected candidates in the five elections held between 1998 and 2014.² We merge this data with various administrative registers using unique personal identifiers. The linked datasets contain detailed information on family relations, including birth order (measured on the maternal side), as well as

²In Sweden, the national and the two regional (county- and municipal-level) elections are held simultaneously on the second (third before 2014) Sunday in September every four years.

various demographic and socioeconomic characteristics and information on cognitive abilities and leadership skills (for males only) from mandatory conscription (see the Appendix for a more detailed description of the registers and the data).

To increase comparability across elections, we focus on those aged between 18 and 47 at the time of each election, i.e., we study the political activity of young and middle-aged individuals. Because we study elections from 1998 to 2014, our sample will thus include individuals born between 1951 and 1996.³ The sample is further restricted to individuals who have at least one and at most four siblings and excludes families with twin siblings. Table A1 in the Appendix reports descriptive statistics for our estimation samples.

An important advantage of the present study is that we have access to information on the entire population, rather than on just a subsample of the most politically engaged citizens as has been the case in many previous studies (Somit et al. 1996; Andeweg and Berg 2003). This means that the impact of birth order can be studied by standard regression techniques, which makes it more straightforward to control for potential confounders such as family background and cohort trends. To handle these challenges, we rely on a within-family regression model of the following type:

$$y_{ij} = \alpha + \sum_{k=2}^m \beta_k I(BO_{ij} = k) + \mathbf{\Gamma}'\mathbf{X}_{ij} + \mu_j + \epsilon_{ij}, \quad (1)$$

where y_{ij} denotes the outcome of interest for individual i in family j , BO_{ij} records the birth order of the individual, μ_j represents family-level (mother) fixed effects, and ϵ_{ij} is an individual level error term. The fixed effects account for the importance of all family characteristics shared by siblings—including, but not restricted to, sibship size, parental age and socioeconomic status—and thereby assure that there are no confounding across-family processes at work. Even with the within-family design, it will, however, be necessary to control for potential confounders that vary between siblings. For this reason, we also include the vector $\mathbf{\Gamma}'\mathbf{X}_{ij}$ in the equation with controls for birth cohort, age at election and gender. Finally, the models include fixed effects for election year.

³The upper age limit is restricted by the fact that the 1951 cohort is the first for which we have information from the conscription tests.

In this study, we will focus on political candidacy at the municipal level. Sweden has 290 municipalities and the municipal councils have between 21 and 101 seats. Much like the national parliament and county level assemblies, the municipal councils are elected using a party-list proportional system. The voters can also cast an optional preference vote for one candidate on the party-list, but most do not use that opportunity and those who do tend to cast their vote on a top candidate. In each of five the municipal elections 1998–2014, between 51,000 and 54,000 candidates ran for public office and of them, around 13,000 were elected. We use our data to construct three outcome measures in increasing order of exclusiveness: (i) running for office, (ii) getting elected and (iii) being placed first on the ballot and elected for office in any of the five elections between 1998 and 2014.

Results

We present the results from the within-family OLS regression models in Table 1. All estimates are rescaled by a factor 100 and can be interpreted as effects in terms of percentage points. There is clear evidence of a negative effect of birth order on all three outcomes, and the effect is also evident when comparing siblings of higher birth order.⁴ The magnitude of these effects should be considered large in light of the low baseline probabilities (reported at the bottom of the table). In the Appendix (Table A3) we provide further evidence of the size of these effects by comparing them to the estimated impact of well-known predictors of political candidacy such as sex and education. The results show that the birth order effect is greater than that of these other factors for all three outcomes.

The estimates also suggest that the relative effect sizes grow stronger for the more exclusive outcomes. This can be seen by comparing the coefficient estimates to the average of each outcome. Moreover, in the Appendix we reproduce the models in Table 1 using a logit estimator. The logit coefficients show that the relative influence of birth order is greatest for being listed first on the ballot and smallest for running for office.

In the introduction, we argued that occupational economic status, cognitive ability and

⁴There is a total of ten possible pairwise comparisons among the five siblings for each outcome. Only one of these 30 comparisons fails to reach statistical significance at the .05 level: the difference in probability of being placed first on the ballot between the third and fourth sibling ($p = 0.297$).

Table 1: Baseline results

	Nominated	Elected	1st on ballot
Second Born	−0.270*** [0.012]	−0.075*** [0.006]	−0.014*** [0.002]
Third Born	−0.382*** [0.023]	−0.100*** [0.012]	−0.025*** [0.005]
Fourth Born	−0.559*** [0.038]	−0.152*** [0.019]	−0.030*** [0.008]
Fifth Born	−0.748*** [0.064]	−0.251*** [0.031]	−0.064*** [0.013]
Female	−0.108*** [0.009]	−0.004 [0.005]	−0.012*** [0.002]
Average	0.579	0.148	0.025
<i>N</i>	11,055,539	11,055,539	11,055,539

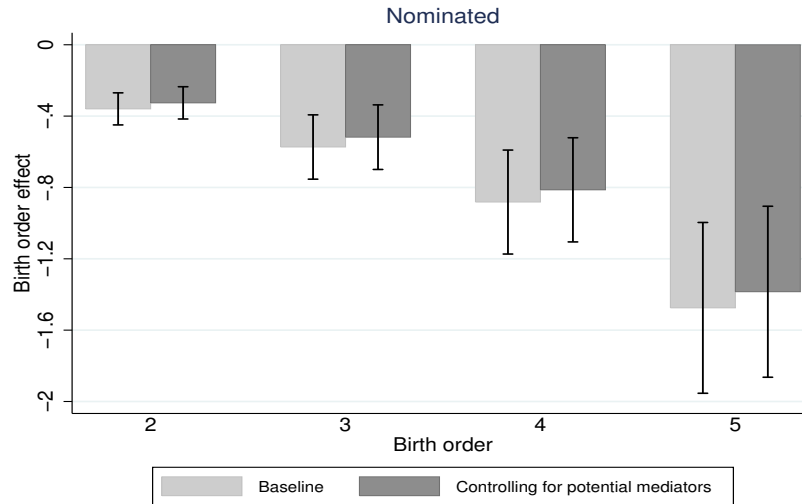
Note: OLS regression estimates using as outcomes (i) running for office, (ii) winning office, and (iii) being placed first on the ballot in the five municipal level elections held between 1998 and 2014. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

personality traits may mediate the relationship between birth order and political candidacy. In Figure 1 we examine to what extent the observed relationship between birth order and running for office is accounted for by these factors. The lightgrey bars in the figure show baseline effects corresponding to the estimates displayed in Table 1, and the darkgrey bars indicate estimates when controlling for education (fixed effects for six attainment and ten content categories), occupation (fixed effects for 52 categories), cognitive ability (fixed effects for nine categories summarizing the results from four subtests intended to capture logical, verbal, spatial, and technical abilities taken at conscription) and leadership skills (fixed effects for nine categories based on interviews with the conscripts conducted by psychologists). For data availability reasons, the sample used to produce the results in Figure 1 is restricted to males born between 1951 and 1980 ($N=2,688,132$).

The estimates displayed in Figure 1 suggest that controlling for these factors only marginally alters the magnitude of birth order effects. Consequently, education, occu-

pational status and cognitive and non-cognitive skills as measured by the conscription tests can, at most, account for about a tenth of the overall effect of birth order on the probability of running for office. In the Appendix we provide corresponding results for the other two outcomes: winning political office and being placed first on the ballot.

Figure 1: Conditional Birth-Order Effects



Note: The lightgrey bars display coefficient estimates (and 95% confidence interval) for the birth order effects from models including fixed effects for family (birth mother), birth year, age at election, and election year. The darkgrey bars display corresponding birth order effects from models including additional controls for education, occupational status, cognitive ability, and leadership skills. The sample is restricted to males born between 1951 and 1980.

In the Appendix we also report a set of auxiliary analyses and robustness checks. Exploiting the fact that some families experienced the death of an older sibling or that an older sibling was put up for adoption, we estimate models separating biological and social birth order effects (Table A4). In line with previous studies on cognitive and non-cognitive abilities, we find that the bulk of the birth order effect is post-natal and social in nature (Black et al. 2018). Moreover, we show that the results are similar for men and women (Table A7) and without any restrictions on individuals' age (Table A8) or elections included in the sample (Table A9). While somewhat more imprecise based on the sample with the fewest observations, we also find the pattern of estimates to be similar in families of different sizes (Tables A10-A12).

Conclusion

Our results show that birth order is related to becoming a political candidate. We find that firstborn children are significantly more likely to run for public office, be a top candidate and win a seat than their younger siblings. Up to this point, research exploring birth order and political behaviors and attitudes have suffered from serious flaws. Previous studies have been based on small unrepresentative samples and have failed to adequately account for family size, occupational status, or cohort differences. The fact that we analyze several cohorts of Swedish population data and utilize a within-family research design enables us to overcome all of these limitations. Therefore, our study provides the first credible evidence of a relationship between birth order and political candidacy. In addition, we show that the birth order effect is also visible among siblings of higher birth order, which indicates that there is more to this relationship than a simple difference between firstborns and their younger siblings.

The results of this study suggest several avenues for future research. First, we were not able to establish the causal mechanisms linking birth order and political participation. Extant theory suggests that sibling competition, parental attention and parental expectations foster factors relevant to politics. While we did not find evidence that occupational status, cognitive ability or leadership skills represent such factors, future research should test other potential causal pathways. We also recognize that since our analysis is based on the single case of Sweden, there is the question of whether our findings travel to other contexts. In particular earlier research on other outcomes indicates that the birth order effects may be contingent on the economic and cultural context (e.g., Tenikue and Verheyden 2010). Ideally, future research will replicate our analysis in other national settings. Finally, birth order likely influences other political behaviors and attitudes that we were not able to study as part of this research note. Hopefully, our findings will inspire others to do work in this area.

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Online appendix to “Big brother sees you, but does he rule you? The relationship between birth order and political candidacy.”

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Appendix A: Details on Data and Measures

This section provides a description of the data sources and variables used for the paper “Big brother sees you, but does he rule you? The relationship between birth order and political candidacy.”

Data Availability

We use individual level data from Swedish registers. The data material is located on an encrypted server to which we have to log in through a remote desktop application in order to perform all of our data analyses. Due to the sensitivity of the data, we are under contractual and ethical obligation not to distribute these data to others.

For those researchers who want to replicate our results there are two ways to get access to the administrative data. The first way is to order the data directly from Statistics Sweden (SCB). Statistics Sweden presently requires that researchers obtain permission from the Swedish Ethical Review Board before data can be ordered (a description 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 all of the variables that we ordered from Statistics Sweden for this project, together with the statistical code used for the analyses.

The second way to replicate our analyses is to come to Sweden and reanalyze these data through the same remote server system that we used. Researchers interested in using this option should reach out to us prior to coming to Sweden so that we can apply for approval from the Ethical Review Board for the researcher to temporarily be added to our research team, which is mandatory in order to get access to the remote server system.

Variables and Data Sources

Nominated — Equal to 1 if the individual ran for office at the municipal level in the five general elections held 1998, 2002, 2006, 2010, and 2014. The information is retrieved

from the Register of Nominated and Elected Candidates held at Statistics Sweden.

Elected — Equal to 1 if the individual was elected for office at the municipal level in the five general elections held 1998, 2002, 2006, 2010, and 2014. The information is retrieved from the Register of Nominated and Elected Candidates held at Statistics Sweden.

First on Ballot — Equal to 1 if the individual was placed first on the ballot and elected for office at the municipal level in the five general elections held 1998, 2002, 2006, 2010, and 2014. The information is retrieved from the Register of Nominated and Elected Candidates held at Statistics Sweden.

Birth Order — Birth order 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 also 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). The information on educational attainment is retrieved from the 1998, 2002, 2006, 2010 and 2014 waves of the Longitudinal integration database for health insurance and labour market studies (LISA by Swedish acronym).

Educational Content — Educational content is measured according to the first digit in the four-digit Swedish standard classification of educational content (SUN 2000) which corresponds to the single digit ISCED 97 fields of education categories: 1) general programmes; 2) education; 3) humanities and arts; 4) social sciences, business and law; 5) science; 6) engineering, manufacturing and construction; 7) agriculture; 8) health and welfare; 9) services; 10; not known or unspecified. The information on educational content is retrieved from the 1998, 2002, 2006, 2010 and 2014 waves of the Longitudinal integration database for health insurance and labour market studies (LISA by Swedish acronym).

Occupational Status — Occupational status is measured according to the first two digits in the four-digit Swedish standard classification of occupations (SSYK) which corresponds to the two-digit ISCO classification of occupations. The information on occupational status is retrieved from the 2002, 2006, 2010 and 2014 waves of the Longitudinal integration database for health insurance and labour market studies (LISA by Swedish acronym).

Cognitive Ability — Cognitive ability is measured on a nine-point stanine scale (mean=5, s.d.=2) summarizing the results from four subtests intended to capture logical, verbal, spatial, and technical abilities. These tests are taken as part of mandatory conscription at about age 18 among the males in the sample. The resulting measure has been shown to be a good measure of general intelligence (Carlstedt, 2000) and positively predicts candidacy status in the Swedish context (Dal Bó et al., 2017). The information is retrieved from the Military Archives of Sweden.

Leadership Skills — Our measure of leadership skills is based on the results from interviews with the conscripts conducted by psychologists. The main objective of the interview was to certify that the conscript could cope with the psychological requirements of the military service and, ultimately, war stress. Based on the interview, the psychologist ranked the conscript's military aptitude along a nine-point stanine scale (mean=5, s.d.=2). It is important to note that this is a measure of a specific ability (military aptitude) rather than a specific trait. Military aptitude has been shown to tap into a bundle of different

personality traits that we should expect to be positively related to candidacy status such as willingness to assume responsibility, emotional stability, independence, persistence, having an outgoing character and power of initiative (Fox and Lawless, 2005; Lawless, 2011; Kanthak and Woon, 2015; Schneider et al., 2016). Above all, the measure of military aptitude used in this study has been reported to be highly correlated with leadership skills (Lindqvist and Vestman, 2011).

Appendix B: Summary Statistics

Table A1 reports descriptive statistics for our estimation samples. The first column displays summary statistics for the full sample whereas column 2-4 provide information about the individuals in families within which there is variation in our three different outcomes: standing as a candidate (column 2); winning a seat (column 3); and being placed on top of the ballot of a party represented in the municipal assembly (column 4) in the five elections held between 1998 and 2014. In column 1 we can see that the outcomes we focus on in this study are very rare (e.g. across the five elections 0.58% of the individuals were nominated and even fewer were elected or placed first on a ballot).

Another thing to note is that the individuals in the within-family samples are more often male, somewhat older and were raised in larger families compared to the individuals in the full sample. The latter pattern (the within-family sample being comprised of older individuals in larger families) is a result of the declining trend in family size coupled with the mechanical relationship between the number of siblings in a family and the likelihood of at least one sibling being politically active. The reason for the surplus of males is related to gender differences in political participation in the Swedish context. Despite the fact that the gender gap has declined over time, males are more likely to run for and win office (Wängnerud and Sundell, 2012). As a consequence, there is less variation (between and within families) in elite participation among females.

Appendix C: Auxiliary Results

Table A2 presents results from conditional logit models with fixed effects for family corresponding to the OLS estimates displayed in Table 1 in the main text. Since the magnitude of the logit coefficients is not affected by the mean of the dependent variables, we can compare the relative size of the effects across columns. The estimates clearly suggest that the relative effect sizes grow stronger for the more exclusive outcomes (winning office and, above all, being placed first on the ballot).

Table A1: Summary Statistics

	Total Sample	Within Family Nominated	Within Family Elected	Within Family 1st on Ballot
Nominated	0.58 (7.59) [11,055,539]	17.0 (37.6) [376,242]	– – –	– – –
Elected	0.15 (3.84) [11,055,539]	– – –	16.0 (36.7) [102,196]	– – –
First on Ballot	0.03 (1.59) [11,055,539]	– – –	– – –	14.1 (34.8) [19,883]
Female	48.7 (50.0) [11,055,539]	46.8 (49.9) [376,242]	48.2 (50.0) [102,196]	44.2 (49.7) [19,883]
Birth Year	1973.5 (10.3) [11,055,539]	1971.7 (9.1) [376,242]	1970.9 (8.8) [102,196]	1970.3 (8.5) [19,883]
Education (Years)	12.4 (1.9) [10,740,662]	12.6 (2.0) [369,112]	12.6 (2.0) [100,397]	12.7 (2.0) [19,524]
Family Size	2.70 (0.82) [11,055,539]	3.01 (0.92) [376,242]	2.99 (0.91) [102,196]	3.06 (0.92) [19,883]
Mother's Birth Year	1946.2 (11.1) [11,055,539]	1944.2 (9.7) [376,242]	1943.6 (9.5) [102,196]	1942.7 (9.4) [19,883]
Mother's Education (Years)	11.1 (2.6) [10,772,333]	11.0 (2.7) [367,877]	10.9 (2.7) [99,917]	11.0 (2.7) [19,298]

Note: Means, standard deviations (in parentheses), and number of observations [in brackets] for some key variables. Column 1 shows summary statistics for the total sample; columns 2-4 display summary statistics for the subset of families within which there is variation in the three outcomes.

Table A2 also displays the marginal effects based on the the logit coefficients (in parentheses). These marginal effects diverge somewhat from the OLS estimates displayed in Table 1 in the main text. Above all, the effects on being nominated are smaller whereas the estimated influence of birth order on getting elected and being place first on the ballot are larger in the conditional logit model. Two things should be noted here. First, the samples used in the logit models are several orders of magnitude smaller, especially for the more demanding outcomes, and therefore are not directly comparable to the OLS estimates reported in the main text. This is a direct consequence of the fixed effect logit estimator dropping all families in which there is no variation in the outcome variable among the siblings. Second, the overall pattern of results is very much in line with the estimates presented in the main text. Thus, the marginal effects show that the likelihood of running for and winning office is decreasing in birth order.

Table A2: Baseline results - logit

	Nom	Elect	First
Second Born	-0.546*** [0.022] (-0.137***)	-0.621*** [0.043] (-0.121***)	-0.702*** [0.098] (-0.148***)
Third Born	-0.713*** [0.040] (-0.172***)	-0.774*** [0.081] (-0.155***)	-1.103*** [0.182] (-0.236***)
Fourth Born	-0.955*** [0.063] (-0.226***)	-1.096*** [0.127] (-0.230***)	-1.269*** [0.277] (-0.272***)
Fifth Born	-1.222*** [0.100] (-0.280***)	-1.764*** [0.206] (-0.388***)	-2.525*** [0.506] (-0.494***)
Average	16.607	15.648	13.788
<i>N</i>	372,046	101,176	19,684

Note: Logit regression estimates using as outcomes (i) running for office (Nom), (ii) winning office (Elect), and (iii) being placed first on the ballot (First) in the five municipal level elections held between 1998 and 2014. The upper entries display coefficient estimates, the mid entries (in brackets) display standard errors clustered by family, and the lower entries (in parentheses) display marginal effects. All models include fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

In the main text we argue that the effects of birth order on political candidacy should be considered large in magnitude. To get a better sense of the size of these effects, Table A3 report estimates from models in which we compare the birth order effect to the effect of well-known and strong predictors of political candidacy: having a college degree and the candidate's sex (Fox and Lawless, 2014). The college indicator variable is defined as having at least 15 years of full-time education.

The results in Table A3 supports our argument that the birth order effects should be considered large in magnitude. Across all three outcomes, the the birth order effect at each parity is greater than the influence of having a college degree or the candidate's sex on the likelihood of running for or winning office.

Table A3: Comparing effect sizes

	Nominated	Elected	1st on ballot
Second born	-0.274*** [0.012]	-0.073*** [0.006]	-0.014*** [0.002]
Third born	-0.386*** [0.024]	-0.096*** [0.012]	-0.024*** [0.005]
Fourth born	-0.564*** [0.040]	-0.147*** [0.020]	-0.030*** [0.008]
Fifth born	-0.763*** [0.067]	-0.248*** [0.032]	-0.063*** [0.013]
College	0.102*** [0.013]	0.047*** [0.007]	0.010*** [0.003]
Female	-0.116*** [0.009]	-0.007 [0.005]	-0.013*** [0.002]
Average	0.595	0.152	0.026
<i>N</i>	10,740,662	10,740,662	10,740,662

Note: OLS regression estimates using as outcomes (i) running for office, (ii) winning office, and (iii) being placed first on the ballot in the five municipal level elections held between 1998 and 2014. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

There are of course multiple possible explanations for the birth order effect on political candidacy. At the most basic level we can distinguish between biological and social birth order effects. The former could result from experiences in-utero that affect development processes connected to cognitive formation (Kristensen and Bjerkedal, 2007) or personality traits (Black et al., 2018) with downstream effects on political behavior. To attempt to isolate these mechanisms, we follow earlier work by Kristensen and Bjerkedal (2007) and Black et al. (2018) and exploit the fact that some families experienced the death of an older sibling or that an older sibling was put up for adoption. In these families, the biological birth order is different from the social birth order.

Table A4 presents results from models in which we distinguish between biological and social birth order effects. Columns 1, 3 and 5 reproduce the results displayed in Table 1 in the main text. In columns 2, 4 and 6 the biological and social birth order effects are allowed to vary. When decomposing the overall birth order effect into a biological and a social mechanism, it is clear that only the social mechanism contributes to the negative effect of being later-born on political candidacy. The social birth order effects are clearly negative whereas, if anything, there is a weak tendency for a positive effect of the biological birth order, especially for the most demanding outcome (being placed first on the ballot). These results are consistent with previous studies on birth order effects on cognitive and non-cognitive abilities (Kristensen and Bjerkedal, 2007; Black et al., 2018).

One should note, however, that biological and social birth order differs only in a small share of the families. Out of the total 1,535,609 families in the estimation sample, birth order is different from the social birth order in 33,923 families. Moreover, the sibling dynamics in these families may differ a lot from the rest of the sample due to the trauma of experiencing the loss of siblings via adoption or early death. To check this, Table A5 presents results based on a sample restricted to the 33,923 families in which the biological and social birth order differs. As should be expected, the estimates in this restricted sample are less precise, especially for the higher parities. Still, the social birth order effects are all negative and, with the exception of fifth born siblings, increasingly stronger for higher parities whereas the pattern of biological birth order effects is inconsistent.

These results suggest that the overall birth order effects are mostly accounted for by social mechanisms.

Table A4: Biological vs. social birth order effects

	Nom	Nom	Elect	Elect	First	First
<i>Social birth order</i>						
Second Born	-0.270*** [0.012]	-0.325*** [0.092]	-0.075*** [0.006]	-0.088** [0.045]	-0.014*** [0.002]	-0.032* [0.019]
Third Born	-0.382*** [0.023]	-0.449*** [0.156]	-0.100*** [0.012]	-0.097 [0.073]	-0.025*** [0.005]	-0.066** [0.030]
Fourth Born	-0.559*** [0.038]	-0.552*** [0.212]	-0.152*** [0.019]	-0.133 [0.099]	-0.030*** [0.008]	-0.095** [0.037]
Fifth Born	-0.748*** [0.064]	-0.869*** [0.298]	-0.251*** [0.031]	-0.298** [0.150]	-0.064*** [0.013]	-0.166*** [0.053]
<i>Biological birth order</i>						
Second Born	—	0.055 [0.091]	—	0.013 [0.044]	—	0.018 [0.019]
Third Born	—	0.069 [0.155]	—	-0.003 [0.073]	—	0.041 [0.029]
Fourth Born	—	-0.010 [0.210]	—	-0.021 [0.098]	—	0.064* [0.037]
Fifth Born	—	0.121 [0.293]	—	0.046 [0.148]	—	0.103** [0.052]
Female	-0.108*** [0.009]	-0.108*** [0.009]	-0.004 [0.005]	-0.004 [0.005]	-0.012*** [0.002]	-0.012*** [0.002]
Average	0.579	0.579	0.148	0.148	0.025	0.025
<i>N</i>	11,055,539	11,055,539	11,055,539	11,055,539	11,055,539	11,055,539

Note: OLS regression estimates using as outcomes (i) running for office (Nom), (ii) winning office (Elect), and (iii) being placed first on the ballot (First) in the five municipal level elections held between 1998 and 2014. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

In Figure 1 in the main text, we tested whether controlling for socioeconomic status (measured as educational attainment, educational content and occupational status), cognitive ability and leadership skills accounts for the relationship between birth order and the probability of running for office. In Figures A1 and A2 below, we present corresponding results for the other two outcomes: winning office (Figure A1) and being placed

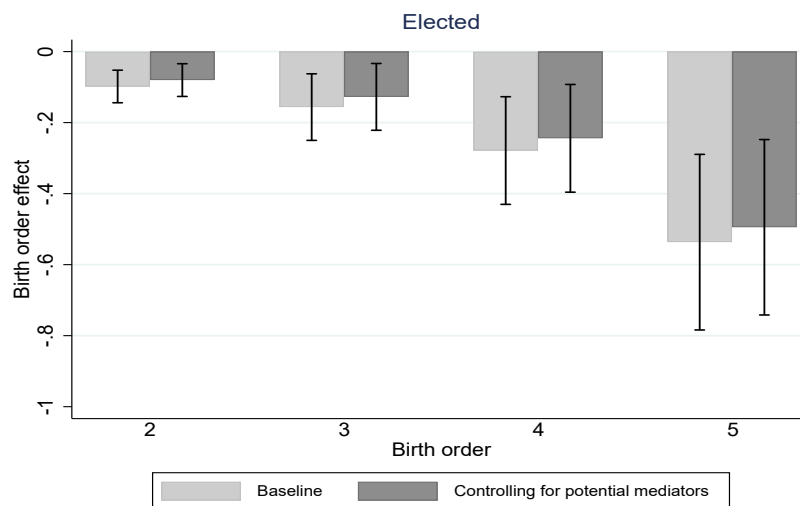
Table A5: Biological vs. social birth order effects - restricted sample

	Nom	Elect	First
<i>Social</i>			
<i>birth order</i>			
Second Born	-0.483*** [0.130]	-0.130** [0.061]	-0.022 [0.026]
Third Born	-0.548** [0.226]	-0.090 [0.119]	-0.041 [0.049]
Fourth Born	-0.781* [0.401]	-0.312 [0.191]	-0.058 [0.066]
Fifth Born	-0.505 [0.685]	-0.306* [0.184]	-0.026 [0.060]
<i>Biological</i>			
<i>birth order</i>			
Second Born	-0.016 [0.107]	-0.007 [0.058]	0.024 [0.022]
Third Born	0.149 [0.171]	0.023 [0.089]	0.050 [0.036]
Fourth Born	-0.015 [0.232]	-0.057 [0.126]	0.071 [0.057]
Fifth Born	0.218 [0.384]	0.173 [0.199]	0.113* [0.068]
Average	0.661	0.179	0.031
<i>N</i>	274,587	274,587	274,587

Note: OLS regression estimates using as outcomes (i) running for office (Nom), (ii) winning office (Elect), and (iii) being placed first on the ballot (First) in the five municipal level elections held between 1998 and 2014. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. The sample is restricted to families in which at least one sibling died at young age and/or at least one sibling was out up for adoption. ***/**/*, indicates significance at the 1/5/10% level.

first on the ballot (Figure A2). The lightgrey bars in the figures show unmediated effects and the darkgrey indicate the corresponding estimates when controlling for education (both attainment and content), occupation (fixed effects for 52 different occupational categories) and cognitive ability and leadership skills (as measured during mandatory conscription). The sample is restricted to males born between 1951 and 1980. As is the case for running for office, the estimates displayed in Figures A1 and A2 suggest that controlling for these potential mediators only marginally alters the magnitude of the birth order effects.

Figure A1: Conditional Birth Order Effects - Winning Office



In Table A7 we have entered interaction terms between birth order and an indicator variable for being female. All covariates except for the family fixed effects are also interacted with the female indicator variable. The interaction coefficients are mostly insignificant and display no clear pattern. This suggests that the birth order effects are similar for men and women.

In the main text we have restricted the estimation sample to political candidacy during the five municipal elections held in 1998, 2002, 2006, 2010 and 2014. Moreover, the sample is restricted to individuals aged between 18 and 47 at the time of these five elections. The rationale behind these restrictions is that we want to include individuals

Figure A2: Conditional Birth Order Effects - First on Ballot

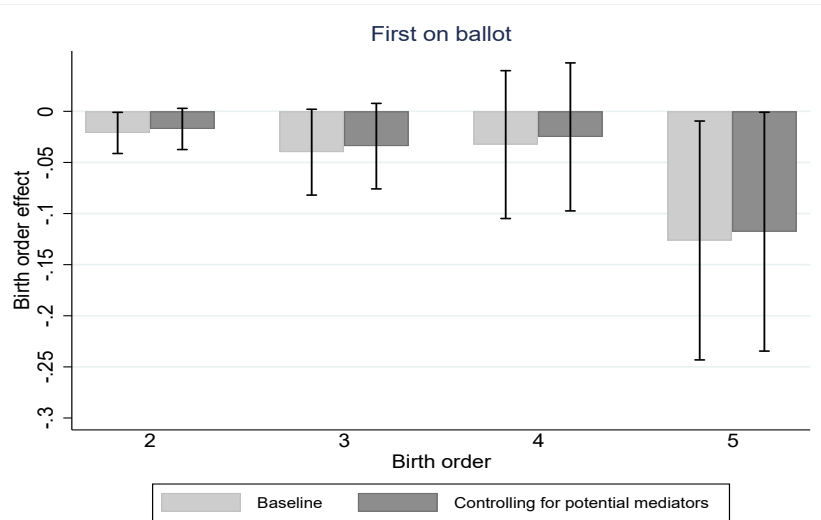


Table A6: Conditional Birth Order Effects

	Nom	Nom	Elect	Elect	First	First
Second Born	-0.360*** [0.046]	-0.326*** [0.046]	-0.098*** [0.023]	-0.080*** [0.024]	-0.021** [0.010]	-0.017* [0.010]
Third Born	-0.573*** [0.092]	-0.518*** [0.092]	-0.156*** [0.048]	-0.128*** [0.048]	-0.040* [0.021]	-0.034 [0.021]
Fourth Born	-0.882*** [0.149]	-0.813*** [0.149]	-0.279*** [0.077]	-0.244*** [0.077]	-0.033 [0.037]	-0.025 [0.037]
Fifth Born	-1.475*** [0.244]	-1.385*** [0.245]	-0.537*** [0.126]	-0.495*** [0.126]	-0.126** [0.060]	-0.118** [0.060]
FE's for education		x		x		x
FE's for occupation		x		x		x
FE's for cognitive skills		x		x		x
FE's for leadership skills		x		x		x
Average	0.763	0.763	0.192	0.192	0.038	0.038
N	2,688,132	2,688,132	2,688,132	2,688,132	2,688,132	2,688,132

Note: OLS regression estimates using as outcomes (i) running for office (Nom), (ii) winning office (Elect), and (iii) being placed first on the ballot (First) in the five municipal level elections held between 1998 and 2014. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. Columns 2, 4 and 6 additionally includes fixed effects for education (seven educational attainment and ten educational content indicators), occupation (52 different occupational categories) and cognitive ability and leadership skills (nine categories as measured during mandatory conscription). The sample is restricted to males born between 1951 and 1980. ***/**/*, indicates significance at the 1/5/10% level.

Table A7: Results by sex

	Nom	Elect	First
Second Born	-0.274*** [0.016]	-0.070*** [0.008]	-0.017*** [0.003]
Third Born	-0.367*** [0.027]	-0.088*** [0.014]	-0.026*** [0.006]
Fourth Born	-0.518*** [0.047]	-0.144*** [0.023]	-0.024** [0.010]
Fifth Born	-0.846*** [0.081]	-0.267*** [0.038]	-0.077*** [0.018]
Second Born × Female	0.008 [0.021]	-0.009 [0.011]	0.006 [0.004]
Third Born × Female	-0.031 [0.027]	-0.027** [0.013]	0.002 [0.005]
Fourth Born × Female	-0.083* [0.048]	-0.017 [0.024]	-0.014 [0.010]
Fifth Born × Female	0.201** [0.099]	0.032 [0.045]	0.027 [0.020]
Average	0.579	0.148	0.025
<i>N</i>	11,055,539	11,055,539	11,055,539

Note: OLS regression estimates using as outcomes (i) running for office (Nom), (ii) winning office (Elect), and (iii) being placed first on the ballot (First) in the five municipal level elections held between 1998 and 2014. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

in the same age span across all elections. Since we only have data from the conscription tests for individuals born 1951 and later, we face a trade-off between including more age cohorts or more elections. In our main analyses, we have settled for a sample including data from the five elections held between 1998 and 2014 implying that the maximum age at each election is 47 years (born 1951 in the 1998 election). Thus, our sample includes young and middle-aged individuals (18-47 years of age).

In Tables A8 and A9, we lift these restrictions in two steps. Table A8 presents baseline results using a sample without any age restrictions. In Table A9, we have also included information from five additional municipal elections held in 1982, 1985, 1988, 1991 and 1994.¹

Three things can be noted with these results. First, when including older individuals in the non-restricted samples, the gender effect grows stronger. Second, the birth order effects are slightly stronger compared to the corresponding estimates reported in Table 1 in the main text. At the same time, the baseline probabilities for the three outcomes are somewhat higher in these on average older samples, suggesting that the relative effect sizes across the different samples are similar. Third, the pattern of increasingly stronger negative effects for higher birth orders is evident irrespective of sample restrictions.

Tables A10 through A12 present results by family size. Two things are noteworthy here. First, the point estimates for the larger families are somewhat larger than the corresponding estimates in the smaller families. The tendency for the penalty of being later-born to increase with family size suggests that a resource dilution mechanisms may be driving the birth order effects on political candidacy (Blake, 1981). However, one should also note that the estimates are quite imprecise for the larger families with fewer observations. Thus, the confidence interval around the estimate for each parity in the larger families overlap the point estimate for the corresponding parity in the smaller families (i.e. the effect of being second-born in five-sibling families vs. four-, three-, and two-sibling families). Second, the pattern of increasingly larger negative effects for higher

¹Until 1994, the elections in Sweden were held every three years. Information on party list position is not available for the 1991 election.

Table A8: Baseline results - no age restrictions

	Nominated	Elected	1st on ballot
Second Born	-0.342*** [0.012]	-0.104*** [0.006]	-0.021*** [0.003]
Third Born	-0.495*** [0.023]	-0.155*** [0.012]	-0.033*** [0.005]
Fourth Born	-0.675*** [0.037]	-0.222*** [0.019]	-0.045*** [0.008]
Fifth Born	-0.806*** [0.059]	-0.288*** [0.029]	-0.069*** [0.011]
Female	-0.265*** [0.009]	-0.056*** [0.005]	-0.029*** [0.002]
Average	0.813	0.217	0.041
<i>N</i>	18,206,798	18,206,798	18,206,798

Note: OLS regression estimates using as outcomes (i) running for office, (ii) winning office, and (iii) being placed first on the ballot in the five municipal level elections held between 1998 and 2014. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

Table A9: Baseline results - no age or election restrictions

	Nominated	Elected	1st on ballot
Second Born	-0.360*** [0.011]	-0.109*** [0.006]	-0.021*** [0.002]
Third Born	-0.535*** [0.021]	-0.162*** [0.010]	-0.034*** [0.004]
Fourth Born	-0.736*** [0.033]	-0.230*** [0.016]	-0.044*** [0.007]
Fifth Born	-0.919*** [0.051]	-0.298*** [0.024]	-0.064*** [0.009]
Female	-0.330*** [0.009]	-0.077*** [0.004]	-0.034*** [0.002]
Average	0.878	0.222	0.041
<i>N</i>	30,359,473	30,359,473	27,689,986

Note: OLS regression estimates using as outcomes (i) running for office, (ii) winning office, and (iii) being placed first on the ballot in the ten municipal level elections held between 1982 and 2014. Information on party list position is not available for the 1991 election. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

birth orders is evident across all outcomes and family sizes.

Table A10: Results by family size - running for office

	2 siblings	3 siblings	4 siblings	5 siblings
Second child	-0.233*** (0.019)	-0.282*** (0.019)	-0.335*** (0.036)	-0.397*** (0.075)
Third child	-	-0.382*** (0.034)	-0.433*** (0.052)	-0.495*** (0.099)
Fourth child	-	-	-0.594*** (0.076)	-0.716*** (0.129)
Fifth child	-	-	-	-0.977*** (0.172)
Average	0.518	0.593	0.721	0.799
Observations	5,435,757	3,862,851	1,343,683	413,248

Notes: OLS regression estimates using a dummy indicator for running for office in the five municipal level elections held between 1998 and 2014 as outcome. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

Table A11: Results by family size - winning office

	2 siblings	3 siblings	4 siblings	5 siblings
Second child	-0.073*** (0.010)	-0.082*** (0.009)	-0.066*** (0.018)	-0.108*** (0.038)
Third child	-	-0.095*** (0.017)	-0.088*** (0.025)	-0.136*** (0.049)
Fourth child	-	-	-0.140*** (0.037)	-0.233*** (0.063)
Fifth child	-	-	-	-0.349*** (0.081)
Average	0.138	0.150	0.172	0.190
Observations	5,435,757	3,862,851	1,343,683	413,248

Notes: OLS regression estimates using a dummy indicator for winning political office in the five municipal level elections held between 1998 and 2014 as outcome. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

Table A12: Results by family size - first on ballot

	2 siblings	3 siblings	4 siblings	5 siblings
Second child	-0.013*** (0.004)	-0.019*** (0.004)	-0.004 (0.007)	-0.030* (0.018)
Third child	-	-0.027*** (0.007)	-0.012 (0.010)	-0.043** (0.021)
Fourth child	-	-	-0.015 (0.015)	-0.055** (0.027)
Fifth child	-	-	-	-0.075** (0.034)
Average	0.022	0.026	0.032	0.038
Observations	5,435,757	3,862,851	1,343,683	414,248

Notes: OLS regression estimates using a dummy indicator for being placed first on the ballot in the five municipal level elections held between 1998 and 2014 as outcome. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models fixed effects for family (birth mother), birth year, age at election, and election year. ***/**/*, indicates significance at the 1/5/10% level.

Finally, in Table A13 we test whether birth order predicts winning office and being placed first on the ballot conditional on being nominated. In essence, this means that we restrict the sample to families in which at least two siblings were nominated at some point. Thus, the sample size is much smaller and the baseline probability of getting elected and placed at the top of a party list of candidates is much higher. As a consequence, the estimates in Table A13 are less precise and also much larger in magnitude compared to the corresponding estimates in Table 1 in the main text. Nevertheless, it is comforting to note that we can reproduce the pattern of negative and increasingly large birth order effects when conditioning on being nominated.

Table A13: Baseline results - conditional on being nominated

	Elect	First
Second Born	-7.049** [3.396]	-1.906 [1.761]
Third Born	-11.462* [6.490]	-4.157 [3.009]
Fourth Born	-16.251* [9.098]	-4.634 [4.350]
Fifth Born	-27.292* [14.157]	-8.338 [7.076]
Average	25.530	4.384
<i>N</i>	64,049	64,049

Note: OLS regression estimates using as outcomes (i) winning office (Elect) and (ii) being placed first on the ballot (First) in the five municipal level elections held between 1998 and 2014. The upper entries display coefficient estimates and the lower (in brackets) display standard errors clustered by family. All models include fixed effects for family (birth mother), birth year, age at election, and election year. The sample is restricted to nominated individuals. ***/**/*, indicates significance at the 1/5/10% level.

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