



# How education, generation and gender jointly structure green and radical right voting

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## ABSTRACT

This article refines our understanding of the socio-structural basis of voting for green and radical right parties by studying how formal education, generation and gender interact. Given the emergent nature of the GAL-TAN cleavage, it, first, theorises that educational gaps in voting for green and radical right parties have widened across cohorts. Second, it argues that this generational widening of the education divide may be gender specific. In line with the argument, the results from age-period-cohort (APC) analyses on data from the European Social Survey (ESS), rounds 1–10, for ten Western European countries show a successive widening of educational gaps across generations. This holds for both men and women regarding voting for the radical right. Concerning green voting, it applies especially to women, with highly educated millennial women being most attracted to green parties. These patterns imply that the GAL-TAN cleavage crystallises with generational replacement.

**KEYWORDS** Age-period-cohort analysis; cleavage; generational change; gender gap; realignment

With the rise of green parties on the left and radical right parties on the right, the political landscape in many Western democracies has changed fundamentally in recent decades. An influential strand of research explains these changes from the perspective of cleavage theory (Lipset and Rokkan 1967). This work suggests that the rise of new parties is driven by a new conflict over issues related to cultural modernisation and globalisation that is structurally rooted in societal divisions (de Wilde *et al.* 2019; Hooghe and Marks 2018; Kriesi *et al.* 2008). One prominent account conceives of the poles of this new cleavage as ‘green-alternative-libertarian’ (GAL) and ‘traditionalist-authoritarian-nationalist’ (TAN), with new-left green parties and radical right parties being its main proponents at the party-system level (Hooghe and Marks 2018).

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At the societal level, formal education levels, generations<sup>1</sup> and gender figure prominently among the socio-structural factors dividing citizens on different sides of this new cleavage. Accordingly, green parties receive more support from the higher educated (Abou-Chadi and Simon Hix 2021; Hooghe and Marks 2025; Ivarsflaten and Stubager 2012), from women (Dolezal 2010) and within each successive generation (Lichtin *et al.* 2023). In contrast, the radical right performs better among the less educated (Hooghe and Marks 2025; Ivarsflaten and Stubager 2012), among men (Givens 2004; Immerzeel *et al.* 2015) and among members of Generation X (Mitteregger 2024; Rekker 2024). However, with a few exceptions that have considered the interplay of at least two of these variables, be it *education and generation* (Steiner 2023; van der Brug and Rekker 2021) or *gender and generation* (Dassonneville 2021; Harsgor 2018; Shorrocks 2018, 2021), their effects have mostly been studied in isolation.

In this article, we propose that in order to better understand voting for green and radical right parties, we need to study how *these three variables interact*. Our argument focusses on how the effect of formal education—which is often considered to be the most important socio-structural marker underlying the new cleavage (e.g. Bovens and Wille 2017; de Wilde *et al.* 2019; Ford and Jennings 2020; Hooghe and Marks 2025; Kriesi *et al.* 2008; Stubager 2010)—may be moderated by generation and gender. We start by proposing that there is an emerging educational divide that grows deeper as generations change. Building on single country studies for the Netherlands (van der Brug and Rekker 2021) and Germany (Steiner 2023), we argue that education makes a bigger difference for green and radical-right voting among those born later, because later cohorts have been socialised into a world in which formal education has been more relevant for individuals' life chances and in which the GAL-TAN divide already had become politically salient.

In a second, more exploratory step, we make the novel argument that the generational widening of the educational gap may be gender specific—but in different ways for the greens and for the radical right. Regarding green voting, we build on research on the 'gender-generation gap', according to which females from more recent cohorts increasingly opt for left parties (Dassonneville 2021; Harsgor 2018; Shorrocks 2018, 2021). We point out that this generational shift is likely to be driven by highly educated women (cf. Inglehart and Norris 2003). Thus, the widening of the education gap in green voting should be more pronounced among women. Conversely, we theorise the radical right to have a stronghold among low-educated men from recent cohorts. The radical right's particular appeal among this voter segment, we argue, results from it feeling most threatened by the twin shift to a knowledge economy and to a

more gender equal society. This leads us to expect the widening of the education gap in radical right voting to be more pronounced among men.

To study how education, generation and gender interactively structure voting for green and radical right parties, we turn to data from the European Social Survey (ESS), rounds 1 (2002) to 10 (2020). We analyse data for those ten Western European countries included in all waves and with electorally relevant green or radical right parties. Consistent with our argument, we find a successive widening of the educational gaps in green and radical right voting across generations. For green voting, the widening of the educational gap is especially pronounced among women, in line with our expectation. With highly educated women of recent cohorts being much more attracted to green parties than highly educated men from these cohorts, it is also the case that gender makes the biggest difference for the probability of green voting among highly educated Millennials. For the radical right, educational gaps have widened among men and women to similar degrees. Counter to our expectation, the probability to vote for the radical right seems similar among low-educated men and low-educated women from recent cohorts. There is some indication, though, that men and women may be drifting apart if we concentrate only on the rather small segment of respondents born in the 1990s (that are already covered by our data).

Overall, our interactive approach enables a more detailed understanding of the socio-structural basis of voting for green and radical right parties. It contributes to at least three important debates. First, and most importantly, our findings contribute to the literature on the socio-structural basis of the new (GAL-TAN, transnational or globalisation) cleavage (for a review, see: Ford and Jennings 2020). From a cleavage perspective, it is of crucial importance to know whether and how differences in vote choice are rooted in social divisions, because it is this socio-structural basis that renders political divides stable and enduring. However, by treating the effects of sociodemographic markers as additive, previous research has underemphasised the extent to which the new cleavage is rooted in social structure: The full extent to which education, generation and gender structure vote choice becomes apparent only when we consider their joint effect. In this way, we can better understand party appeals to specific social segments, such as the green stronghold among highly educated female Millennials. Second, our article speaks to an ongoing debate on how voting differs across generations (e.g. Norris and Inglehart 2019; Schäfer 2022). On top of differences in levels of party support across generations that have been the prime focus of this literature, our findings for the Western European context point to generational differences in the socio-structural divisions underlying vote choices. Third, we add to an emerging body of research suggesting that electoral realignment is largely

driven by generational replacement (e.g. Haffert and Mitteregger 2023; Jocker *et al.* 2025; Steiner 2023; van der Brug 2010; van der Brug and Rekker 2021). From this perspective, our finding that the socio-structural divisions in terms of education—and, for the greens, in combination with gender—become wider in more recent cohorts is consistent with the notion of there being an emergent cleavage that crystallises with generational replacement.

The remainder of this article is structured as follows. Building on previous literature, Section ‘Voting for green and radical right parties: towards an interactive approach’ lays out our theoretical argument in more detail. Section ‘Data and methods’ gives information on data and methods. Section ‘Empirical results’ presents our results. The Conclusion summarises and discusses our findings and points to avenues for future research.

### **Voting for green and radical right parties: towards an interactive approach**

In this section, we start out by discussing previous literature on the effects of generation, education and gender on voting on the GAL-TAN cleavage. While we depart from a broader cleavage perspective, our discussion focusses on voting for green and radical right parties, its two key party poles—as will our subsequent empirical tests. Developing our argument step by step, we begin with differences across generations, then turn to the role of education and argue that its effect is larger in more recent generations. Subsequently, we add gender to the picture, discussing the possibility of gender specific patterns in the widening education divide.

The publication of ‘Cultural Backlash’ (Norris and Inglehart 2019) has sparked a renewed debate on differences in levels of party support across *generations*. Several recent studies have applied age-period-cohort analysis to repeated cross-national survey data to delve deeper into cohort differences in levels of party support and to distinguish those from period and life cycle effects (Lichtin *et al.* 2023; Mitteregger 2024; Rekker 2024). Focusing on voting for the greens in Western Europe, Lichtin *et al.* (2023) find that, controlling for age and period effects, support for the greens increases with each successive generation. Mitteregger (2024) focuses on generational realignment within the left-wing and right-wing camps in Western Europe. Like Lichtin *et al.* (2023), Mitteregger finds a roughly linear increase in the probability to vote for the greens (rather than another left-wing party) across generations. For the right-wing camp, Mitteregger also reports evidence of generational realignment to the radical right, with the probability to vote for the radical right (rather than another right-wing party) peaking among those politically socialised in

the 1980s and 1990s. Rekker (2024) presents a comprehensive analysis of 21 Western established democracies that looks at voting for eight party families. One of its main findings is a generational decline in support of the traditional mainstream parties, i.e. social-democratic, Christian democratic and conservative parties, in more recent cohorts. In line with Lichtin *et al.* (2023) and Mitteregger (2024), this is mirrored in a monotonic generational increase in green party support. For the radical right, Rekker (2024) finds support to be roughly similar across generations, yet with a peak among members of Generation X and a low among those born between 1910 and 1927.

In order to understand the evolution of party strength, these studies suggest that generational change is crucial. What these studies may overlook, however, is that it is specific groups within generations who are attracted to particular parties. For example, it stands to reason that the generational rise of the greens is strongly associated with rising levels of formal education, and that it is the combination of being highly educated and from a more recent generation that matters most. When it comes to the radical right, previous studies' finding of limited aggregate differences across generations may mask the radical right's appeal to specific segments within generations. In a mirror image to what we might see among green voters, it may be the combination of holding lower levels of formal education and being from a more recent generation that matters most. Thus, in addition to differences in levels of party support across generations, we may also see emerging differences within generations.

Many studies of the new cleavage identify formal education as the key socio-structural marker that divides individuals on different sides of the GAL-TAN cleavage (e.g. de Vries 2018; de Wilde *et al.* 2019; Garritzmann 2025; Hooghe and Marks 2025; Kriesi *et al.* 2008; cf. Ford and Jennings 2020). As attitudes on socio-cultural and globalisation-related issues and voting for new left vs. radical right parties are strongly associated with formal education, some go as far as speaking of an 'education cleavage' (Bovens and Wille 2017; Stubager 2010). Generally, formal education may affect political preference formation through two main channels. On the one hand, formal education is seen as causing more emancipative value orientations. As a result, higher levels of formal education are linked to an appreciation for cultural diversity and a cosmopolitan outlook, thus attracting the higher educated to parties that promote associated policies—whereas the lower educated are attracted to parties that are more nationalist, authoritarian and traditionalist. On the other hand, structural economic changes associated with a shift to a knowledge economy and increased international economic integration have elevated the importance of formal education in the job markets of affluent democracies. The lower skilled are relative economic losers of these transformations,

or ‘losers of modernisation’ (Betz 1994) and ‘globalisation’ (Steiner *et al.* 2024), which can create a sense of resentment to which radical right parties may appeal. In line with the resulting expectations for party choice, studies find that voting for the radical right is more likely among the lower educated (Abou-Chadi and Simon Hix 2021; Hooghe and Marks 2025; Ivarsflaten and Stubager 2012) and voting for the greens more likely among the higher educated (Abou-Chadi and Simon Hix 2021; Dolezal 2010; Hooghe and Marks 2025).

However, what has been often overlooked (but see Steiner 2023 and van der Brug and Rekker 2021) is that the impact of education on voting for the greens and the radical right may not be the same across cohorts.<sup>2</sup> In particular, we expect education to be more consequential within later-born cohorts. We posit that two mechanisms may have led to education becoming more consequential for more recent cohorts, one grounded in labour market experiences and the other in political socialisation. First, the information revolution and the shift to a knowledge society has *gradually* amplified the relevance of formal education for individuals’ life chances. Accordingly, the labour market experience of more recent cohorts has been increasingly affected by the rising returns to education that have resulted from these transformations. In particular, it may be the less educated in later cohorts to whom arguments about loss of subjective social status, which makes them vulnerable to right-wing populist mobilisation, apply with particular force (Gidron and Hall 2020; Spruyt *et al.* 2016).<sup>3</sup> Second, unlike earlier cohorts, those born later have been socialised into a world in which the GAL-TAN divide already had become politically salient. The heightened salience of the new divide in their formative years should have increasingly motivated the lower and the higher educated to build allegiances to parties situated at different sides of the divide, that is, parties of the radical right and green parties, respectively. In contrast, voters from older cohorts, who had already developed loyalties to the ‘old’ mainstream left-wing and right-wing parties, are less likely to have been attracted by the newer contenders.

Based on these mechanisms, we propose two hypotheses of a widening education divide, one for the greens and one for the radical right:

H1<sub>green</sub>: The education gap in green voting widens across generations.

H1<sub>radical right</sub>: The education gap in radical right voting widens across generations.

Existing single-country studies for the Netherlands (van der Brug and Rekker 2021) and Germany (Steiner 2023) already point to a generational widening of the education divide. In their analysis of electoral realignment over time and cohorts in the Netherlands, van der Brug and Rekker (2021)

find that education explains, overall, more variance in voting propensities in more recent cohorts. This is in line with the thrust of our argument, but the study does not report *how* specifically education affects voting for individual parties or party families differently in different generations—and whether it does so along the lines suggested here. Even more closely connected to our argument, Steiner (2023) documents a generational transformation of the education divide in Germany, according to which high education increasingly divides voters of the new-left greens and the radical-right AfD (‘Alternative for Germany’) in more recent cohorts. Yet, due to the short time-series for the AfD (founded in 2013), the study cannot delineate cohort from age effects. No study that we are aware of has tested for a generational widening of the education gap in green and radical right voting for a broader Western Europe sample. We take on this task in the present study.

In addition to this first main contribution, we go one step further and explore whether the generational widening of the education divide may be gender specific. This is our second main contribution. In arguing for gender specific patterns, we build on existing research that has highlighted a ‘modern gender gap’ in voting (Inglehart and Norris 2003): In the past, women were more likely to vote for conservative parties than men; this pattern first disappeared and later even reversed. Today, women in advanced democracies tend to vote disproportionately for center-left and left-wing parties (Abendschön and Steinmetz 2014; Giger 2009; Inglehart and Norris 2000; Koepl-Turyna 2021). Existing research shows that this reversal of the gender gap is primarily driven by generational change: To be precise, it is not so much that individual women have changed their vote over time, but rather that women from more recent cohorts vote differently from those from older cohorts (Dassonneville 2021; Harsgor 2018; Shorrocks 2018, 2021). As women from younger cohorts have replaced women from older cohorts, being female has become more strongly associated with voting for left-wing parties. Thus, there is a ‘gender-generation gap’ according to which the effects of gender and generation on voting for left vs. right parties interact.

Several explanations have been offered for this long-term (generational) shift, but the increasing participation of women in the labour market is usually one of them (e.g. Giger 2009; Iversen and Rosenbluth 2006). As women reject the traditional family model, they favour policies that help reconcile family and work (for both women and men). Left-wing parties are the strongest advocates of day care for young children, full-time schooling, and public infrastructure to care for the elderly and sick. Thus, women are more likely than men to vote for parties that support the welfare state and egalitarian policies (Sass and Kuhnle 2023). While women in general may lean towards left-wing parties, high-skilled women

in particular may favour green parties, which are the most committed to gender equality. These parties seek not only to redress the injustices that result from persistent gender inequality, but also to prevent them from occurring in the first place. However, the literature on the modern gender gap in voting tends to subsume green parties under the label of ‘left-wing parties,’ which risks overlooking differences in voting for different center-left parties (cf. Mitteregger 2024).

What is missing from the analysis of the modern gender gap so far is the combined effect of cohort and education. Across rich democracies, women are clearly the winners of educational expansion. Among younger cohorts, women significantly outperform men in terms of grades and degrees: Among Millennials, the share of women attaining the highest level of education far exceeds that of men (see Figure B-2 in the [Online Appendix](#)). At the same time, women are still more likely to work part-time (at least for some periods), to take longer breaks from paid work after the birth of children, and to care for the elderly. As a result, the highest positions in the labour market are still disproportionately occupied by men, and the notorious gender pay gap persists (EIGE 2023). For the female ‘winners of tertiarization,’ success does not promise the same rewards as it once did, and perhaps still does, for men.

What this discussion suggests is that the generational shift of women turning to (new) left parties, i.e. the ‘gender-generation gap,’ may be chiefly driven by *highly educated* women. It is highly educated women from younger cohorts whom we expect to show the strongest demand for gender equality measures and progressive policies in general. With especially highly educated women from recent cohorts being drawn to green parties, and less so highly educated men from these cohorts, the widening of the education divide hypothesised in  $H1_{green}$  should be more pronounced among women. We thus put forth the following hypothesis for green voting:

$H2_{green}$ : Driven by a green stronghold among highly educated women from recent cohorts, the widening of the education gap in green voting is more pronounced among women.

While previous research shows men to vote disproportionately often for the populist radical right (Donovan 2023; Givens 2004; Hartevelde *et al.* 2015; Immerzeel *et al.* 2015; Spierings and Zaslove 2017), little is known so far about how the propensity of men to vote for the radical right differs across generations and levels of education. We see reason to believe that arguments about subjective losers of modernisation and globalisation being attracted to the radical right (see above) apply to lower educated *men* most forcefully. Their status in society has come under pressure in different ways: They are not only relative losers of the expansion of skills and labour market competition, the rise of gender equality

also threatens their roles as breadwinners and heads of families. Moreover, lower-educated men from more recent generations are least likely to live with a partner and be married (Hudde and Engelhardt 2023). In support of the political repercussions these developments may have, Off *et al.* (2022) find that the backlash against the advancement of women's rights is most pronounced young men, and in particular among those in vulnerable conditions. For radical right voting, we hence expect:

H2<sub>radical right</sub>: Driven by a radical right stronghold among lower educated men from recent cohorts, the widening of the education gap in radical right voting is more pronounced among men.

## Data and methods

### Sample

To test these hypotheses, we use data from the European Social Survey (ESS), rounds 1 (2002) to 10 (2020). We focus on those Western European countries included in all ten waves of the ESS to obtain a balanced sample. From these twelve countries, we dropped those in which green or radical right parties never, or at least for most of the time, did not play a relevant role (Portugal and Spain).<sup>4</sup> This leaves us with ten countries, which we use for the analysis of green voting: Belgium, Finland, France, Germany, Ireland, Netherlands, Norway, UK, Sweden, Switzerland. Given the absence of a radical right party in Ireland, we further dropped Ireland from the analysis of radical right voting, leaving us with nine countries for this analysis. At the individual level, we limit our main analyses to respondents aged 25 and older. This is done because individuals below the age of 25 are often still in education and we would otherwise, for example, code respondents who are on course to completing tertiary education as having obtained a lower level of formal education.<sup>5</sup> To minimise this problem, we use age 25 as a cut-off point.

### Dependent variables

Our dependent variables are based on a question about vote choice in the last national election. The assignment of parties to the greens and the radical right largely follows the party family classifications of ParlGov (Döring *et al.* 2023), although we have used additional sources to code (small) parties that are missing in ParlGov. We list all parties coded as green and radical right by country in Table A-1 of the [Online Appendix](#). Our main outcome variables are two binary variables, coded 1 for having voted for a green/radical right party and 0 for having voted for another party. Abstention, not eligible to vote and voted blank/invalid are coded as missing values.

## **Generations**

We follow Grasso (2014) and Mitteregger (2024) who have developed a generational scheme specifically tailored to the Western European context. It classifies birth cohorts according to the different historical political contexts they were socialised into (Mitteregger 2024: 3). The scheme distinguishes six birth cohorts: those born until 1925 ('Interwar Generation'), those born between 1926 and 1945 ('Post-War Generation'), those born between 1946 and 1957 ('60–70s Generation'), those born between 1958 and 1968 ('80s Generation'), those born between 1969 and 1979 ('90s Generation') and those born from 1980 onwards ('Millennial Generation'). The scheme overlaps with the four-cohort scheme used by Norris and Inglehart (2019) but is a bit more fine-grained and thus better suited to detect gradual shifts (that we expect to see). To check that our conclusions do not hinge on a specific cohort classification, we also re-run our analysis with an even more fine-grained classification which simply sorts respondents into eight generations by decade of birth (cf. Jocker *et al.* 2025) and report the results as robustness check (see [Online Appendix Section F](#)).

## **Education**

We measure formal education through the highest educational degree obtained. We distinguish between three categories: lower secondary or below, upper secondary and tertiary education. Overall, these groups each make up about a third of our sample. Over time, there has been a huge shift in educational degrees across cohorts in our sample: Whereas those with (below) lower secondary education make up a majority within the Interwar and Post-War Cohorts, they are a small minority among Millennials (see Figure B-2 in the [Online Appendix](#)). This shift is much more pronounced among women than men. While 71% of women (and 57% of men) in the Interwar Generation have obtained (below) lower secondary education, 53% of female (and 46% of male) Millennials have obtained tertiary education. As the educational expansion has been much more dramatic among women than men, gender gaps in educational attainment have reversed.

## **Control variables**

In addition to cohort and education, we control for basic sociodemographic variables at the individual level, namely age, gender and immigration background. Following van der Brug and Rekker (2021), we distinguish between the life phases of late adolescence (–21), early

adulthood (22–29), middle adulthood (30–65) and late adulthood (66–). Due to the sample being limited to those 25 and older, we effectively differentiate only between the latter three age groups, however. Gender is measured as a binary variable in the ESS differentiating between male and female. Immigration background is coded 1 for individuals when they themselves or their parents were not born in the respective country.

## Models

Because our data are characterised by a hierarchical structure with individuals nested in combinations of country and ESS round, we estimate multilevel models with individuals nested in country-rounds with random intercepts at the country-round level.<sup>6</sup> As our two outcome variables are binary, we estimate these multilevel models as binary logistic regressions. We include dummy variables for ESS rounds, thereby controlling for period effects. By including effects of cohorts, age groups and ESS rounds (i.e. periods), we follow standard practice of age-period-cohort (APC) analysis. Like van der Brug and Rekker (2021) and Jocker *et al.* (2025), for example, we thus aim to disentangle age, period and cohort effects by running regressions that include all three as predictors, while coding birth years and age in life years into theoretically informed categories and estimating period effects freely by including dummy variables for each ESS round. This follows the approach to solve the APC identification problem through imposing a functional form for the regression models that is informed by theoretical assumptions (Kritzer 1983). To accommodate the different electoral strengths of green/radical right parties across countries, we also include a set of fixed effects for countries.

In a first step, we aim to test  $H1_{\text{green}}$  and  $H1_{\text{radical right}}$  by running models that include a set of two-way interactions between education, on the one hand, and generation, age group and ESS wave, on the other. This allows us to tease out generational differences in the effect of education from age- or period-based differences in the effect of education. In a second step, we aim to test  $H2_{\text{green}}$  and  $H2_{\text{radical right}}$  by adding an interaction with gender. Thus, in these models we include three-way interactions (1) between education, gender and generation, (2) between education, gender and ESS wave, and (3) between education, gender and age group.

In order to interpret the results from these models, we rely on (mean) predicted probabilities of voting for the greens/radical right at different values of cohort and education (and gender). We also consider conditional (average) marginal effects of education across (1) cohorts ( $H1_{\text{green}}$  and  $H1_{\text{radical right}}$ ) and (2) across combinations of cohorts and gender ( $H2_{\text{green}}$  and  $H2_{\text{radical right}}$ ). These quantities are computed on the basis of

the fixed part of the model. As recommended in Berry *et al.* (2010), we thereby evaluate the presence of interaction effects in binary logit models by considering effects on the probability scale (rather than from the statistical significance of the product term in the regression model) (see also Ai and Norton 2003).

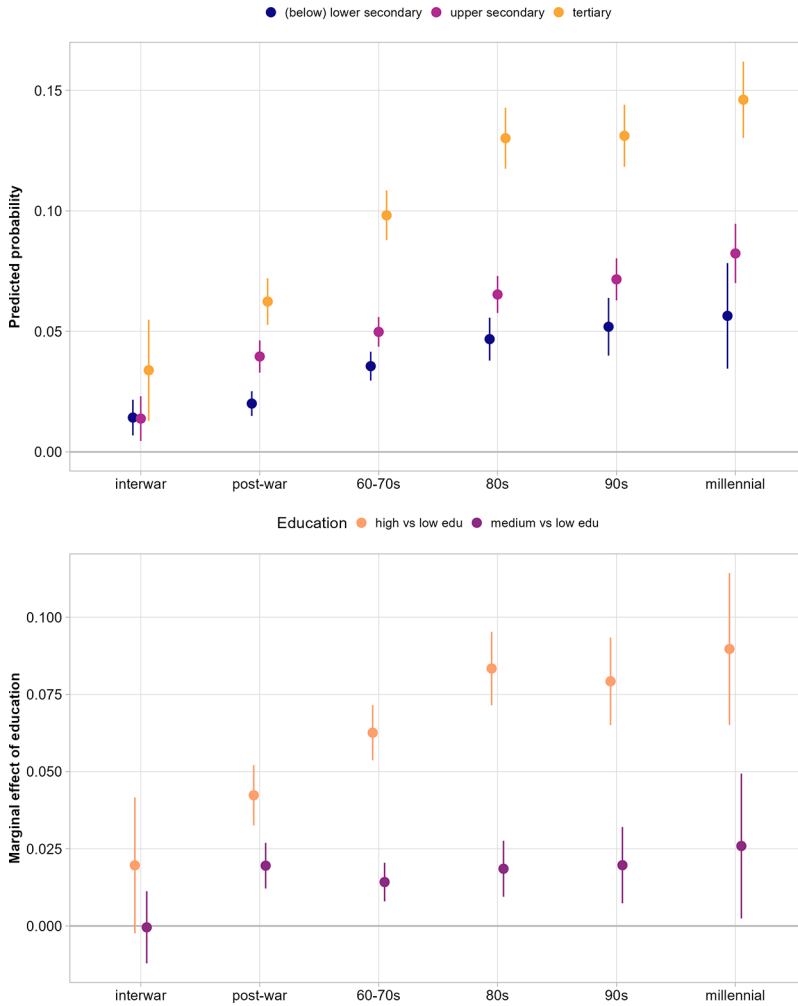
## Empirical results

### *Voting for green parties*

We ran multilevel logistic regressions explaining the choice of a green party in the last general election versus the choice of any other party. Before turning to the results on the two-way and three-way interactions, we report—as a benchmark—results from simple additive models. The results of all these models are displayed alongside each other in Table C-1 in the [Online Appendix](#). We begin with a model with only cohorts, age groups, ESS wave and gender (model 1 in [Online Appendix Table C-1](#)). This model indicates that each successive cohort is more likely to vote green than the one before it, in line with previous research (Lichtin *et al.* 2023; Mitteregger 2024; Rekker 2024). Women are also significantly more likely to choose the greens. Even when we include birth cohort and wave fixed effects, the probability of voting for a green party is highest for younger respondents and decreases with increasing age. The second model adds education and immigration background (model 2 in [Online Appendix Table C-1](#)). The previous results remain intact and as we move from the lowest to the highest levels of formal education, the probability of voting green strongly increases, too. Finally, people with a family history of immigration are also more likely to vote for the greens.

The third model additionally interacts cohorts and levels of education. To interpret this model, we turn to [Figure 1](#). It shows the predicted probabilities of voting for a green party in the top panel and average marginal effects of education in the bottom panel. As before, we see a general increase in the probability of voting for green parties from the oldest to the youngest cohorts. There is also a clear influence of education: In each cohort, the probability of voting green tends to increase with the level of formal education.

Most crucially, these differences across educational groups tend to become larger in more recent cohorts in line with  $H1_{\text{green}}$ , though with a plateau from the 80s Generation onwards. For the latest three cohorts, the effect of education is much stronger than for earlier ones. From the Interwar Generation to the 80s Generation, the effect of high (vs. low) education increases almost linearly. Within the 80s, 90s and Millennial Generation, the highly educated are about 8–9 percentage points more



**Figure 1.** Voting for a green party by cohort and education.

Note: Predicted probabilities (upper part) and marginal effects (lower part) with 95% confidence intervals from multilevel binary logistic regression with three-way interaction between education, cohort and gender (model 3 in Table C-1 in the [Online Appendix](#)).

likely to vote for the greens than the low educated. With almost 15%, the predicted probability of green voting reaches its highest level among Millennials with tertiary education. In addition to the effect of education being larger in more recent cohorts, [Figure 1](#) also reveals the generational increase in support for the Greens to be not uniform: It is steepest among those with tertiary education.

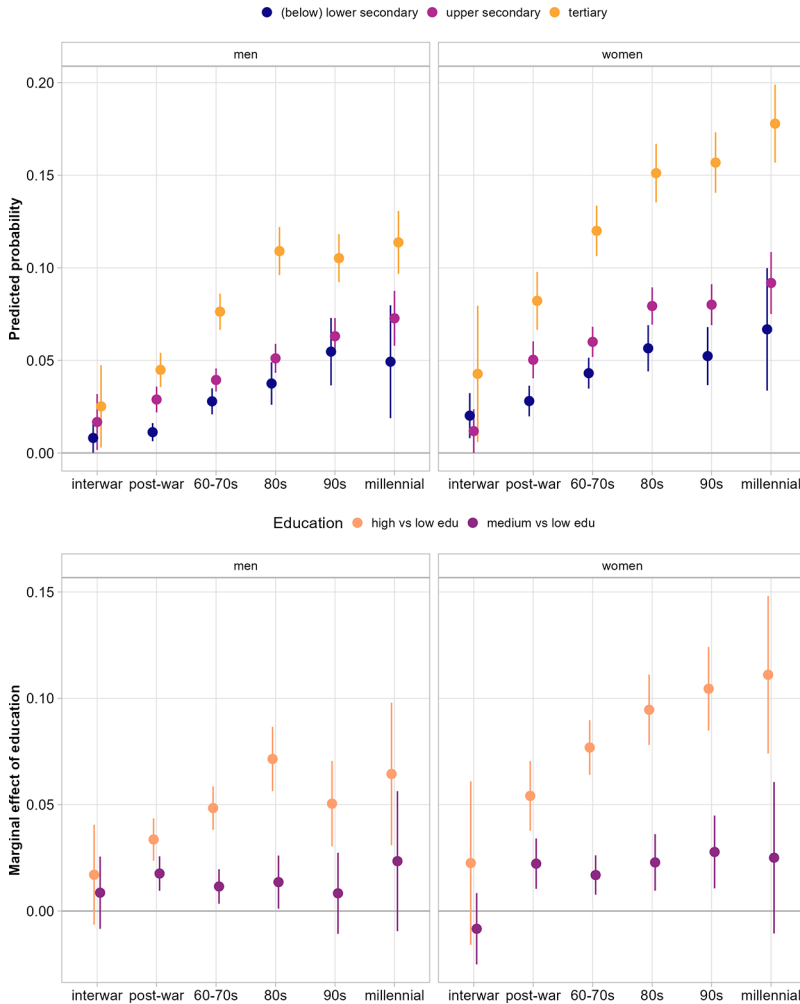
Recall that these results are net of period and age-related variation in the effect of education. We display predicted probabilities by education and ESS wave ([Online Appendix Figure D-1](#)) and by education and age

group (Figure D-2) in the [Online Appendix](#). Regarding age, the slight life cycle-related decline in green support holds for all educational groups. Regarding period effects, there is a tendency of green support to increase over time, which is concentrated among those with tertiary education. Thus, similar to the widening of the education gap *across generations*, there is also a tendency for the education gap to widen *over time*. While this period effect is also in line with our general expectation of a crystallising cleavage, the pattern is less clear than for cohorts (which might reflect that our data cover only two decades).

Next, we turn to [Figure 2](#) to interpret the results of the most complex model that includes three-way interactions between education, cohort and gender (see model 4 in Table C-1 in the [Online Appendix](#)). As above, we display predicted probabilities in the upper part and marginal effects of education in the lower part, this time divided by respondents' gender with the results for men on the left-hand side and for women on the right-hand side. Looking at the predicted probabilities first, we see that the probability of voting Green is highest among highly educated female millennials (with a probability of about 18%), in line with our expectation of a green stronghold in this segment. Looking at the differences between educational groups across cohorts, we see that the expectation of a successive widening of the education gap ( $H2_{\text{green}}$ ) applies more strongly to women. The gap between women with low and high levels of education is largest among millennial women, at about 11 percentage points. There is no such clear widening among men: While gaps between education groups widen for men up to the 80s generation, they narrow again in later cohorts. These results are line with  $H2_{\text{green}}$ , and thus qualify the results on  $H1_{\text{green}}$  from above: The widening of the education gap in green voting is more pronounced among women.<sup>7</sup>

Looking at these results from the perspective of how generational differences are contingent on education and gender, we see that the steepest rise in the probability of voting Green is among highly educated women: Among the Interwar Generation, about 4% of them are predicted to vote for the greens, but among Millennials, the share more than quadruples to about 18%. Generational increases are more modest both among men and among women with lower levels of education.

Another angle is to ask what these interactions reveal about the effect of gender. In that regard, a visual inspection of the predicted probabilities indicates, in line with previous research, that the probability of green voting tends to be generally higher among female respondents. Comparing the predicted probabilities on the right- and left-hand side of the upper part of [Figure 2](#) more closely, we see that the biggest difference between men and women in green voting is found among highly educated



**Figure 2.** Predicted probabilities and marginal effects of voting for a green party.

Note: Predicted probabilities (upper part) and marginal effects (lower part) with 95% confidence intervals from multilevel binary logistic regression with three-way interaction between education, cohort and gender (model 4 in Table C-1 in the [Online Appendix](#)).

Millennials. The marginal effect plot in Figure D-5 in the [Online Appendix](#) reveals this more clearly: It shows the difference between women's and men's probability of voting for the greens in the 18 groups defined by generation and education. In most groups, women are statistically significantly more likely to vote green than men. However, the gender gap is generally larger among those with higher levels of education and especially so among those from the two most recent cohorts. While among those with a medium level of education, the differences between the

genders mostly hovers around 2 percentage points only, among highly educated Millennials women are about 6 percentage points more likely to vote for green parties than men.

Finally, results by period (ESS wave) again point in a similar direction as the cohort patterns, though being less pronounced. As shown in [Online Appendix Figure D-3](#), the probability to vote green tends to increase *over time* as well—and it does so especially among highly educated women. This results in a widening education divide especially among women, and an increasing gender divide among the highly educated.

In the [Online Appendix](#), we present robustness checks from re-running the three-way interaction model with more fine-grained generations defined by decades of birth (see [Online Appendix Figure F-1](#)). These lead to similar substantive conclusions and further confirm our expectation of a successive widening of the education gap in green voting, that is chiefly driven by women. As we partition the Millennial Generation into two distinct cohorts (i.e. those born in the 1980s and those born in the 1990s), the results point to a further widening of the education gap in green voting in the most recent cohort of those born in the 1990s, with the estimated difference between the high and low educated being about 15 percentage points among women from this cohort. Thus, the divergence is again mostly driven by highly educated women whose predicted probability of voting green is at about 19% among those born in the 1990s compared to about 11% for highly educated men from the same cohort. These results come with considerable statistical uncertainty, however, as the confidence intervals become wide given sparse data, especially for the low educated in the 1990s. As the groups become smaller and the estimates more imprecise, we stick to the broader categories for the main analyses.

### ***Voting for radical right parties***

For the radical right parties, we expect to see patterns that are mostly a reverse image of those for the greens. To briefly reiterate the expectations outlined above: We expect early cohorts, if anything, to be overall less supportive of radical right parties than more recent cohorts, women to vote for them less often than men, and a negative effect of education that is more pronounced in more recent cohorts ( $H1_{\text{radical right}}$ ). Moreover, we hypothesised the generational widening of the gender gap to be more pronounced among men, driven by strong support for the radical right among low educated men from recent cohorts ( $H2_{\text{radical right}}$ ).

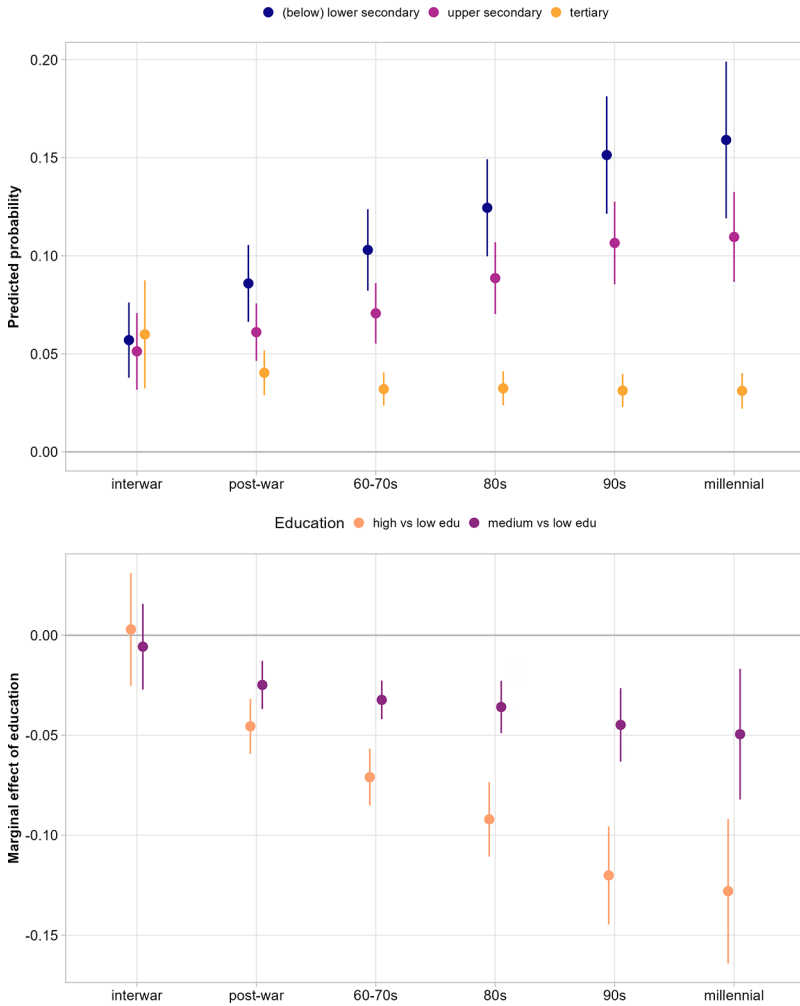
Again, we turn to multivariate models to test these expectations in a stepwise manner. In a baseline model with no interactions and only cohorts, age groups, ESS wave and gender, members of the three older

cohorts, especially those of the Interwar Generation, are significantly less likely to vote for a radical right party (see model 1 in Table C-2 in the [Online Appendix](#)). Between the three most recent generations, there are effectively no differences. If anything, support for the radical right is marginally lower among Millennials compared to the 1980s and 1990s generation. These results are broadly in line with those from previous studies (Mitteregger 2024; Rekker 2024). Moreover, women are less likely to vote for radical right parties, and age does not have an additional impact. The second model confirms that the probability to vote for the radical right decreases with higher levels of education and is lower among those with an immigration background.

The upper part of [Figure 3](#) shows the predicted probabilities of a model in which cohort and education are interacted (see model 3 in Table C-2 in the [Online Appendix](#)). Two observations are worth noting. First, in the group of respondents with lower education, the predicted vote share increases steeply as we move from older to younger cohorts. At a somewhat lower level, this is also true for those with medium education. However, among the highly educated, the probability of voting for radical right parties decreases in later-born cohorts, at least compared to the Interwar Generation.<sup>8</sup> It follows, second, that the education gap in voting for radical right parties widens considerably across cohorts.

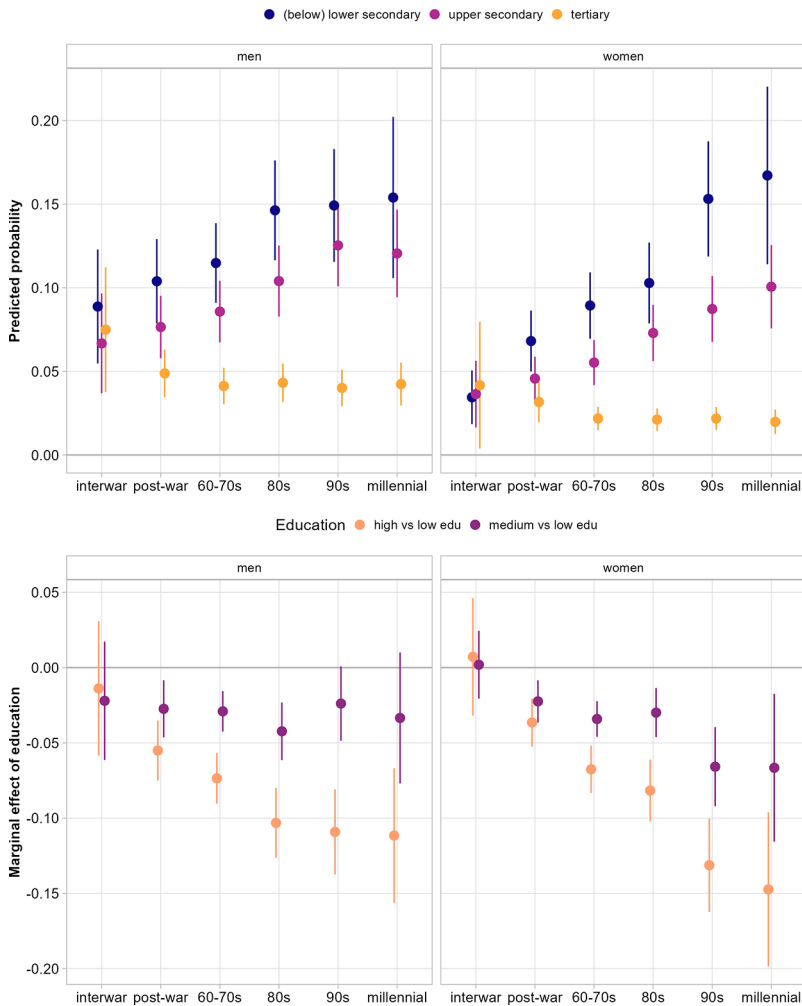
The marginal effects shown in the lower part of [Figure 3](#) confirm the increasingly strong effect of education. In each cohort apart from the Interwar Generation, those with a medium or high level of education are significantly less likely to vote for a radical right party than those with the lowest level of education, and the gap between education groups widens as we move from earlier to more recent cohorts. Among Millennials, the likelihood of voting for the radical right is about 5 percentage points lower among those with upper secondary education, and even 13 percentage points lower among those with tertiary education, than in the low education group. Accordingly, we can confirm  $H1_{\text{radical right}}$  of a widening educational gap.<sup>9</sup>

Finally, we look at the results of a model that interacts education, cohort and gender (see model 4 in Table C-2 in the [Online Appendix](#)). [Figure 4](#) visualises the findings. The predicted probabilities by cohort and education in the top of the figure show similar pictures for men and women. The marginal effect plots in the bottom contrast the predicted voting behaviour of educational groups across the different cohorts, separately for women and men. The figure shows that the highly educated among more recent cohorts are significantly and substantially less likely to vote for the radical right. Yet, the education gap widens across cohorts for both women and men in a largely similar manner.<sup>10</sup> This result is at odds with  $H2_{\text{radical right}}$ .



**Figure 3.** Voting for a radical right party by cohort and education. Note: Predicted probabilities (upper part) and marginal effects (lower part) with 95% confidence intervals from multilevel binary logistic regression with three-way interaction between education, cohort and gender (model 3 in Table C-2 in the [Online Appendix](#)).

While the radical right is strong among lower-educated men from recent cohorts, as we expected, it is—surprisingly to us—equally strong among lower-educated women from recent cohorts. In [Online Appendix Figure D-10](#), we look at the gender differences (by generation and education) directly. The figure shows that across most cohorts, women are less likely to vote for radical right parties than men—but this difference is not increasing as we move from the earliest to the most recent cohorts. In fact, for the two most recent cohorts, women and men with the lowest level of education vote for these parties at indistinguishable rates. Thus,



**Figure 4.** Predicted probabilities and marginal effects of voting for a radical right party.

Note: Predicted probabilities (upper part) and marginal effects (lower part) with 95% confidence intervals from multilevel binary logistic regression with three-way interaction between education, cohort and gender (model 4 in Table C-2 in the [Online Appendix](#)).

whereas for medium and high levels of education, the gender gap is similar for each cohort, among the low educated, it seems smaller, even absent, in the two most recent cohorts.

While these results are surprising in light of the expected stronghold of the radical right among lower-educated men from recent cohorts, they connect to the results for the greens in one way: There we found that within younger cohorts it is the combination of being higher educated and female that is most strongly associated with voting for the greens.

For the radical right, we find a partial mirror image of this result in that females in recent cohorts are only repelled from voting for the radical right when they hold at least medium levels of education.

In the [Online Appendix](#), we present robustness checks from re-running the model with the three-way interactions with more fine-grained cohorts defined by decades of birth (see [Online Appendix Figure F-2](#)). These results are generally similar to the results from above, but with an important nuance: When breaking the Millennial Generation down into two cohorts of those born in the 1980s and those born in the 1990s, there are now signs of divergence between lower educated men and lower educated women among those born most recently. While the predicted probability of low educated men from this cohort to vote for the radical right is at 18% (its highest value), it is at only 12% for low educated women from this cohort. The results tentatively suggest a further widening of the education gap in radical right voting among men born in the 1990s, but not among women. If anything, educational gaps among women born in the 1990s have narrowed again, compared to women from earlier cohorts. This would be in line with  $H2_{\text{radical right}}$ . However, much of this remains speculative as the confidence intervals become very wide for those born in the 1990s, especially for the lower education groups, due to sparse data. Thus, while there is some indication in the data of lower educated men and lower educated women to finally trend further apart in their propensity to support the radical right among those born most recently, this needs to be revisited by future research to draw any firm conclusion.

## Conclusion

In this article, we have focused on parties that emerged as a consequence of the ‘silent revolution’ (Inglehart 1977) and the ‘silent counter-revolution’ (Ignazi 1992): Green and radical right parties. These party families are often seen as opposites on the globalisation and modernisation cleavage that increasingly structures contemporary party systems. In contrast to earlier studies, we look at the interplay of education, cohort and gender. While each individual marker has been extensively studied, combinations of at least two of them have been studied rarely and a potential three-way interaction between them has been overlooked entirely (to the best of our knowledge). However, there are reasons to expect that these three socio-structural markers influence voting behaviour not only in isolation but in an interactive manner. While younger cohorts might be overall more likely to vote for either radical right or green parties, we expected a widening of differences between education groups across cohorts. Accordingly, higher levels of formal education increasingly raise the likelihood of voting for a green party but decrease the likelihood of voting

for a radical right party. Within the highly educated group, women, especially those born more recently, can be expected to vote disproportionately for parties that fully subscribe to gender equality, allowing them to reap the benefits of their educational success (cf. Breyer 2024). Conversely, among the lower educated, it might be men, especially those born more recently, who—as relative losers of modernisation and globalisation—are most attracted to the radical right.

To test these expectations, we used data from the European Social Survey for ten Western European countries between 2002 and 2020. We ran multilevel logistic regression models to explain the vote choice for either green or radical right parties. Based on age-period-cohort models, we found consistent effects of birth cohort on voting behaviour: In line with previous studies (Lichtin *et al.* 2023; Mitteregger 2024; Rekker 2024), older cohorts are overall less likely to vote for radical right parties and support for the greens increases with each successive generation. Within cohorts, education also affects voting. In all generations (except the Interwar Generation), the probability of voting for the radical right decreases with higher education levels, while the probability of voting for the greens increases. Crucially, these differences are much more pronounced in recent cohorts.

For the greens, this generational widening of the education divide applies especially to women. Highly educated women from recent cohorts are the most likely to vote for a green party and significantly more likely than highly educated men. Accordingly, gender makes the biggest difference for green voting among those with the highest education levels from the most recent cohorts,<sup>11</sup> education impacts green voting more for women than men, and the gap between lower and higher educated women in green voting has widened across generations. For the radical right, the generational widening of the education divide applies to men and women to similar degrees—at least when applying our default, established cohort classification (Grasso 2014; Mitteregger 2024). This latter result runs counter to our expectation.

Why then do we find the expected green stronghold among highly educated females from recent generations but not, to an equal degree, the expected radical right stronghold among low educated men from recent generations? A plausible possibility is that gender differences among the lower educated in the propensity to support the radical right are only a recent phenomenon. Our results from using a more fine-grained cohort classification that splits Millennials into those born in the 1980s and those born in the 1990s are consistent with this interpretation: Within the 1990s cohort, lower-educated men stand out, also from lower-educated women, in their support for the radical right. Yet, because of sparse data,<sup>12</sup> these estimates lack precision. This possibility would also be in

line with the observation of recently accelerating gender divides among young people that gained a lot of attention in media reports (Burn-Murdoch 2024; Mathisen 2025). Not least because our work suggests these gender divides to interplay with education, we hope that future research revisits the question of (educational) gender divides in recent generations once sufficient new data has become available.

Future studies may also extend the present analysis in three other directions. First, it might be of interest to extend our analysis to voting for other party families. For example, based on the reasoning above, we would expect highly educated younger males to vote for market-oriented liberal parties more frequently. Second, it might be worthwhile to bring nonvoting into the picture as we otherwise overlook that the lower educated in recent cohorts are also especially likely to not vote at all (Schäfer *et al.* 2020). Third, we have refrained from studying attitudinal differences that may lie beneath the interactive effects on party choice. When it comes to political attitudes, there are also few studies that consider interactive effects. However, there are exceptions, for example, studies on how educational gaps in socio-cultural attitudes differ across generations (Lindskog and Oskarson 2023), studies on generational differences in which issues are associated with left-right positions (Steiner 2024) or studies on generational differences in how issue are associated with vote choice (Jocker *et al.* 2025). It seems fruitful to bring these perspectives into conversation in future research to better understand the mechanisms behind widening education divides in vote choice across generations and by gender.

For now, our interactive approach enables more detailed insights into the socio-structural basis of vote choice along the GAL-TAN divide, compared to an additive approach. This sets us in a position to qualify findings from previous research which have dealt with these factors in an additive fashion. First, while it is, of course, true that green and radical right voting is structured by education, this is more clearly the case in more recent cohorts. Second, while there are overall differences across generations in the probability of voting for the greens and the radical right, generational trends differ heavily by education and, for the greens, also by gender. Third, while women are overall more likely to vote for the greens, this is especially true for highly educated Millennials.

## Notes

1. In this article, we use the terms generations and (birth) cohorts interchangeably.
2. Gethin *et al.* (2021) show how the effect of education on left/right voting has changed *over time*. These authors document a 'reversal of the education

cleavage' in that high education was associated with voting for the 'right' in the past and became associated with voting for the 'left' only over time (also see: Kitschelt and Rehm 2023). However, their study does not delve into how the effect of education on voting for green and radical right parties varies across cohorts.

3. Another important consideration here is that holding lower levels of formal education was the norm in earlier cohorts. As a result of the mass expansion of education, this has shifted dramatically, now leaving those with low levels of formal education (i.e. (below) lower-secondary degrees) as minorities within their cohorts (see [Online Appendix Figure B-2](#); also see Garritzmann 2025).
4. See [Figure B-1](#) in the [Online Appendix](#), which shows vote shares for green and radical right parties per country and ESS wave for the initial twelve countries.
5. Because we have many more young Millennials in our sample, we would otherwise heavily distort differences in educational degrees across cohorts. In the full sample, only 29 percent of Millennials hold a tertiary degree (compared to 44 percent of members of the 90s Generation). Among those 25 and older, 48 percent of Millennials hold a tertiary degree (compared to 44 percent of members of the 90s Generation). On the flipside, this decision means that we lose about half of the Millennials in our sample. However, the remaining number (about 25,000 respondents, which amounts to 12 percent of the sample) remains large enough to make a sensible analysis feasible.
6. These random intercepts account for fluctuations in the strength of green/radical right parties at the country-round level. Alternatively, this is achieved by regression models with fixed effects for country-rounds. As shown in [Table E-1](#) in the [Online Appendix](#), such models produce essentially identical results.
7. These patterns already emerge in a simple descriptive break-down of the share of green voters by education, generation and gender (see [Online Appendix Figure B-3](#)).
8. To square these results with the overall cohort patterns discussed above, it is important to bear the compositional shifts between cohorts in mind (see [Figure B-2](#) in the [Online Appendix](#)): While radical right support increased among the lower educated across generations, the group of the lower educated has also become smaller across generations.
9. We present the accompanying predicted probabilities by ESS wave ([Figure D-6](#)) and age group ([Figure D-7](#)) in the [Online Appendix](#). Accordingly, there are essentially no life cycle effects (for all educational groups). The probability to vote for the radical right increases markedly over time, especially with wave 7 (2014). This jump in radical right support takes place among all three education groups.
10. As was the case for the greens, these patterns already emerge in a simple descriptive break-down of the share of radical right voters by education, generation and gender (see [Online Appendix Figure B-4](#)).
11. A complimentary explanation for this pattern lies in the role of *fields* of education (Hooghe *et al.* 2024; Martin *et al.* 2025): Compared to highly educated men, highly educated women are more likely to have studied in

cultural-communicative fields, which are associated with a higher propensity to support GAL parties.

12. Recall that we include only individuals above the age of 25. The last birth year that is observed in our models for the radical right is 1997.

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## Disclosure statement

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

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