U.PORTO

MESTRADO EM PSICOLOGIA
PSICOLOGIA DAS ORGANIZAÇÕES, SOCIAL E DO TRABALHO

Generations, Electoral Contexts, and Age Differences in Satisfaction with Democracy in Portugal, 2002 - 2025

Diogo Ricardo da Silva Andrade

M

2026

Universidade do Porto

Faculdade de Psicologia e de Ciências da Educação

GENERATIONS, ELECTORAL CONTEXTS, AND AGE DIFFERENCES IN SATISFACTION WITH DEMOCRACY IN PORTUGAL, 2002 - 2025

Diogo Ricardo da Silva Andrade

Outubro, 2026

Dissertação apresentada no Mestrado em Psicologia, na área de Psicologia das Organizações, Social e do Trabalho, Faculdade de Psicologia e de Ciências da Educação da Universidade do Porto, orientada pelo/a Professor Doutor **Patrício Costa** (FPCEUP).

AVISOS LEGAIS

O conteúdo desta dissertação reflete as perspetivas, o trabalho e as interpretações do/da autor/a no momento da sua entrega. Esta dissertação pode conter incorreções, tanto concetuais como metodológicas, que podem ter sido identificadas em momento posterior ao da sua entrega. Por conseguinte, qualquer utilização dos seus conteúdos deve ser exercida com cautela.

Ao entregar esta dissertação, o autor declara que a mesma é resultante do seu próprio trabalho, contém contributos originais e são reconhecidas todas as fontes utilizadas, encontrando-se tais fontes devidamente citadas no corpo do texto e identificadas na secção de referências. O autor declara, ainda, que não divulga na presente dissertação quaisquer conteúdos cuja reprodução esteja vedada por direitos de autor ou de propriedade industrial.

Sem prejuízo do disposto anteriormente, o autor declara que recorreu a ferramentas de Inteligência Artificial durante o processo de elaboração deste trabalho. Em particular, utilizou-se o Claude para apoio na estruturação do texto, revisão gramatical e utilização da plataforma R Studio, e o DeepL para tradução do texto. O recurso a estas ferramentas limitou-se aos usos descritos, mantendo-se as ideias, a análise, a interpretação dos resultados, a elaboração científica e a redação inicial da Dissertação integralmente da responsabilidade do autor.

Agradecimentos

Há 5 anos, um rapaz sonhador e curioso, acabado de sair da escola, tomava uma decisão algo incerta de tirar uma licenciatura num contexto novo, desta vez sem os amigos de sempre. Olhar para este percurso académico e em tudo o que o envolveu faz-me ter a certeza de que esta foi uma escolha acertada. Saio um homem diferente, mais maduro, mais conhecedor e, acima de tudo, mais feliz por tudo o que tive a oportunidade de experienciar, todas as pessoas que tive o prazer de conhecer e tudo o que pude aprender.

Este percurso nunca teria sido possível sozinho, pelo que devo um agradecimento infindável a todos aqueles que para ele contribuíram.

Começo por deixar um enorme agradecimento a um verdadeiro Professor, Orientador e Amigo, o Professor Patrício Costa, com quem aprendi durante a elaboração desta dissertação. Surgiram-me dúvidas, nomeadamente relativas à minha capacidade de concluir este projeto, porém, a certeza de que escolhi o Professor certo para me orientar na realização do mesmo foi sempre um fator de motivação extra. Agradeço-lhe imenso pela orientação baseada na compreensão, respeito, amizade, disponibilidade, aprendizagem e partilha de assuntos alheios à dissertação, que contribuiu para uma maior tranquilidade na sua realização.

À minha Querida Mãe, o meu anjo da guarda, a quem devo tudo aquilo que sou e sei hoje e que partiu sem ter a oportunidade de me ver a ingressar e a cumprir este objetivo, que também era o dela. Sei que aí em cima estás feliz e orgulhosa por isto, como também sei que estás sempre comigo, inclusive nos momentos mais difíceis deste trajeto, que consegui superar graças à tua guia e aos teus esforços hercúleos para me proporcionar todos os meios para eu viver e aprender. A Ti, agradeço-te eternamente por todos os esforços e dificuldades que passaste para eu poder estar aqui, com saúde e condições para concluir este projeto. Estarás para sempre comigo, minha Querida Mãe.

A toda a minha família, que me acompanhou ao longo de todo este processo. À minha Avó, por ter tomado conta de mim todos os dias, em conjunto com a minha Mãe, e por ser um exemplo na forma como, apesar das inúmeras perdas e dificuldades que a vida lhe trouxe e traz, mantém um carinho inigualável por todos os que lhe são próximos. Ao meu Irmão André, por toda a ajuda e companhia ao longo da minha vida, bem como todos os importantes conselhos dados, vindos de um modelo que admiro e em quem sempre me inspirei, sendo um verdadeiro Irmão no sentido da palavra, que me deu também as condições para que pudesse estudar em

tempos mais complicados. À minha Madrinha, por me ter acolhido numa das fases mais difíceis da vida, por todos os esforços feitos para que nada falte diariamente. Ao meu Pai, por ter contribuído ao longo deste percurso e por estar sempre disponível para me acolher.

À Ana, por representar, sem dúvida, o melhor que a faculdade me trouxe e com quem tenho a oportunidade de partilhar, não só este trajeto, mas também uma bonita história de amor. Por ser um porto de abrigo quando tudo à volta se parece desmoronar, pela presença que é capaz de melhorar até os dias mais sombrios, por fazer de mim uma pessoa melhor sempre e por ser um claro exemplo de alguém que é capaz de dar tudo de si para que todos à sua volta estejam bem. És, sem dúvida, uma pessoa fundamental na minha vida.

Aos meus amigos de longa data, por todos os momentos de convívio e confraternização essenciais para descontrair depois de semanas inteiras de estudo. Obrigado por mostrarem a importância que um grupo de amigos pode ter na nossa vida, pela camaradagem e presença, independentemente da distância ou da menor disponibilidade de tempo. Àqueles que conheci na faculdade, agradeço por todos os laços que estabeleci e faço questão de manter para além do fim deste projeto, por todos os almoços partilhados durante os dias de aulas e todas as conversas que tornavam esses dias menos morosos.

À Prima Nanda, que infelizmente partiu antes do fim deste trajeto, e que estava sempre disposta a ajudar em tudo o que fosse preciso, tendo sido um exemplo de resiliência notável para mim, que guardarei comigo para sempre. Deixo-lhe um sincero e profundo agradecimento por ter sempre acreditado em mim e por todos os incentivos que me deu.

Resumo

Esta dissertação analisou a variação da satisfação com a democracia entre 2002 e 2025, com o objetivo de compreender os efeitos da idade, do período eleitoral e das dinâmicas geracionais, bem como de outras variáveis atitudinais e sociodemográficas.

A análise baseou-se nos dados dos inquéritos pós-eleitorais do *Portuguese Election Study* (PES) (Lobo et al., 2024; Lobo et al., 2025), medindo a satisfação com a democracia ao longo das nove eleições legislativas portuguesas entre 2002 e 2025.

Os resultados sugeriram a existência de um efeito do período eleitoral e de algumas variáveis individuais sobre a satisfação, sem evidência de efeitos da idade e da geração. O período constituiu-se como um preditor forte e persistente, com a satisfação a atingir o nível mais baixo entre 2009 e 2011, período em que Portugal foi afetado pela crise económica da Grande Recessão. A avaliação do governo foi o preditor mais forte, explicando grande parte da satisfação elevada em 2022, embora não tenha explicado a satisfação reduzida em 2011, o que está em linha com a distinção entre apoio específico e apoio difuso à democracia. Verificou-se, adicionalmente, que os resultados principais se mantiveram robustos numa especificação binária alternativa da variável dependente.

Em suma, a satisfação com a democracia associou-se sobretudo ao contexto e ao período eleitoral, e não a padrões agregados relacionados com a geração ou idade, reforçando a importância das dinâmicas de período na interpretação do apoio à democracia em Portugal.

Palavras-chave: Satisfação com a democracia; idade-período-coorte; eleições; Estudo Eleitoral Português; Portugal; Modelo ordinal.

Abstract

This dissertation analysed changes in satisfaction with democracy between 2002 and 2025, seeking to understand the effects of age, electoral period and generational dynamics, as well as other attitudinal and sociodemographic variables.

The analysis was based on data from the post-election surveys of *the Portuguese Election Study* (PES) (Lobo et al., 2024; Lobo et al., 2025), measuring satisfaction with democracy across the nine Portuguese general elections between 2002 and 2025.

The results suggested an effect of electoral period and certain individual variables on satisfaction, with no evidence of effects from age or generation. Period emerged as a strong and persistent predictor, with satisfaction reaching its lowest level between 2009 and 2011, when Portugal was affected by the economic crisis of the Great Recession. Government evaluation was the strongest predictor, accounting for much of the high satisfaction in 2022, although it did not explain the low satisfaction in 2011, consistent with the distinction between specific and diffuse support for democracy. The main findings were additionally confirmed as robust to an alternative binary specification of the dependent variable.

In short, satisfaction with democracy was primarily associated with electoral context and period, rather than with generational or age-related aggregate patterns, reinforcing the importance of period dynamics in interpreting support for democracy in Portugal.

Keywords: Satisfaction with democracy; age-period-cohort; elections; Portuguese Electoral Study; Portugal; ordinal model.

Index

Introduction 1

Theoretical framework 2

Method 6

Study design 6

Participants and data 7

Operationalisation of variables 7

Dependent variable 7

Temporal Independent Variables 7

Control variables 9

Analytical strategy 10

Ethical framework 12

Results 13

Sample characteristics 13

Age and Satisfaction with Democracy 14

Cohort and Satisfaction with Democracy 15

Synthetic cohort model 16

Electoral context and satisfaction with democracy 18

Full Model 2002–2025 18

The role of government evaluation in the period effect 22

Assumptions 24

Robustness checks and Model performance metrics 25

Discussion 25

Conclusion 29

Limitations and practical implications 30

Limitations 30

Practical implications 32

References 33

Appendices 40

Introduction

Nowadays, satisfaction with democracy is a widely studied topic in political science, constituting one of the most relevant and widely used indicators for assessing the stability and legitimacy of democratic regimes in the eyes of their citizens (Singh & Mayne, 2023). Foa, Klassen, Slade, et al. (2020) show that in various parts of the world, notably North America, Southern Europe, Latin America and Sub-Saharan Africa, satisfaction with democracy has declined sharply. In Southern Europe, there was a widespread decline in political trust following the economic crisis of the Great Recession of 2008 (Tsatsanis et al., 2021), which significantly affected the region; recovery diverged between countries, with trust restored to pre-crisis levels in Portugal but remaining persistently low in Spain and Greece (Christmann et al., 2025). Gorbunova and Raimundo (2013) demonstrated that this volatility has long been evident in Portugal: in 1999, it was the country with the highest satisfaction with democracy in mainland Europe (79% *very satisfied*); by 2008, at the height of the Great Recession, this had fallen to 39%.

It is frequently suggested, in the literature and in public debate, that younger generations tend to be less satisfied with democracy than previous generations were at the same stage of life (Foa & Mounk, 2016; Foa, Klassen, Wenger, et al., 2020), associated with factors such as difficulty finding employment and precarious working conditions (Quaranta & Martini, 2016, 2017).

This dissertation analyses possible predictors of satisfaction with democracy in Portugal, examining the possible existence – or absence – of associations between several independent variables and the dependent variable, satisfaction with democracy.

Data were drawn from the Portuguese Election Study (PES) (Lobo et al., 2024; Lobo et al., 2025), whose post-election surveys cover all nine Portuguese legislative elections between 2002 and 2025. As different respondents are observed across these years, the data allow for an exploratory assessment of age-, period-, and cohort-related patterns, though not of within-individual change over time, which constitutes a limitation of this design.

This dissertation adopts an approach inspired by the age-period-cohort (APC) model, though not a formal one, given the identification problem and multicollinearity among its three temporal components, which renders the approach necessarily exploratory. A hierarchical age-

period-cohort (HAPC) model was also estimated to address this limitation and assess whether the two approaches converge.

Theoretical framework

Singh and Mayne (2023) identified more than 400 publications on satisfaction with democracy, confirming it as one of the most widely studied topics in political science, examined both as an outcome and as a predictor of other political phenomena.

Satisfaction with democracy is an indicator of citizens' assessment of how the democratic system functions. It is therefore important to distinguish satisfaction with democracy as a principle from satisfaction with its actual functioning, a distinction closely resembling Easton's (1965, 1975) separation between diffuse support for the democratic system and specific support for its performance. This dissertation focuses on satisfaction with the functioning of democracy in Portugal, which is closer to specific support than to diffuse support. Dissatisfaction with democratic performance does not necessarily imply dissatisfaction with democracy itself, nor a preference for an authoritarian regime (Linde & Ekman, 2003).

This indicator varies over time under the influence of several mechanisms: amongst others, the life cycle of each individual, linked to how satisfaction changes with ageing; the specific historical and electoral context, which affects all age groups simultaneously; and the shared socialisation experiences of those born within the same time frame, which may endow a generation with distinctive attitudes. Age, period and cohort cannot, however, be isolated, given their exact mathematical interdependence - cohort corresponds to the difference between age and period (Fienberg & Mason, 1979; Mason & Fienberg, 1985; Yang & Land, 2013; Bell & Jones, 2018). A given result may therefore reflect any of these three mechanisms, or a combination of them, without allowing a definitive conclusion as to which. This limitation is addressed through multiple specifications, including an HAPC model (Appendix Table F1 and F2) (Bell & Jones, 2018).

Portugal is particularly relevant for examining these effects, given its relatively recent transition to democracy in 1974 as part of the third wave of democratisation (Huntington, 1991). The 'transition fatigue' hypothesis suggests that satisfaction tends to rise in the first decades following a democratic transition, particularly among young people who, through their activism

and defence of political and civic freedoms, contributed significantly to the fall of authoritarian regimes. As a new generation with no memory of authoritarian rule reaches adulthood, more concerned with democracy's functioning than its intrinsic value, legitimacy gradually fades, and satisfaction declines when citizens face issues such as youth unemployment, corruption, inequality or crime, just as observed in the first generation to live under democratic rule compared with the older generations who fought to establish it (Foa, Klassen, Wenger, et al., 2020). In Southern Europe, the memories of right-wing authoritarian regimes may have acted as a protective factor against this loss of legitimacy, although this protection may weaken as such memories fade (Tsatsanis et al., 2021).

Age may also matter through the life-cycle approach, which posits a shift in political attitudes as citizens grow older, reflecting accumulated life experience, economic stability, and a more consolidated relationship with institutions (Braungart & Braungart, 1986). Under this approach, differences between generations at a given time may reflect life stage rather than lasting generational difference, although life-cycle development occurs within a specific social and historical context. Some studies find a U-shaped relationship between age and satisfaction with democracy, with lower levels in middle age and higher levels among the young and the elderly (Wong et al., 2017), contradicting the linear version of this theory, which predicts that satisfaction increases throughout the life cycle.

The literature also emphasises the political and historical context in which elections take place. Thus, the period effect consists of large-scale events capable of simultaneously affecting individuals of different ages and generations at a given point in time (Yang & Land, 2008), particularly during severe economic crisis such as the Great Recession (Armingeon & Guthmann, 2014), which significantly affected several countries, notably in Southern Europe, and was associated with a decline in political trust (Christmann et al., 2025).

Satisfaction with democracy may also be explained by cohort and generational effects. Though often used interchangeably, the two terms differ conceptually: a cohort comprises people born within the same time interval who age together, whereas a generation additionally develops a shared consciousness and distinctive attitudes (Ryder, 1965; Braungart & Braungart, 1986). Given the impossibility of directly testing group consciousness, this dissertation tests for cohort effects.

The literature on cohort effects is divided. One line of research points to a persistent generational divide in Western democracies, with each successive generation reporting lower

satisfaction than the previous one at the same life stage (Foa, Klassen, Wenger, et al., 2020), a divergence also evident in commitment to democracy as a system (Foa & Mounk, 2016). A second line of research does not confirm this: Zilinsky (2019) shows that Millennials do not differ from the rest of society in their assessment of democracy, with younger people in fact more satisfied than their elders. Other studies confirm the absence of consistent generational differences or find only a modest effect (Wuttke et al., 2022).

Educational attainment has been associated with higher satisfaction with democracy (Gorbunova & Raimundo, 2013), consistent with Arellano et al. (2026), who found positive associations with democratic outcomes in 60% of 76 studies. This appears to contrast with the 'critical citizens' thesis, whereby higher education and access to information act as drivers of cognitive mobilisation, leading citizens to be more demanding and sceptical in their assessment of the performance of institutions and governments (Inglehart, 1997; Norris, 1999). In Portugal, this thesis finds only partial confirmation since, although specific support declined while diffuse support remained stable, cognitive mobilisation – measured through political interest and media exposure – had no significant impact on citizens' expectations of the political system (Teixeira et al., 2014).

Unemployment has been linked to lower satisfaction with democracy (Quaranta & Martini, 2016). Friedrichsen and Zahn (2014), using data from 16 Western European countries, including Portugal, show that the unemployed are significantly less likely to be satisfied with democracy than the employed, with unemployment the strongest economic predictor of this satisfaction.

Religious attendance, a form of social and community integration, may also be associated with satisfaction with democracy, although evidence from Portugal is scarce. Friehe and Pfeifer (2024) found a positive association in Germany, consistent with the broader literature on social capital (Putnam, 1993, 2000).

Another variable addressed in the literature is party proximity, particularly through the 'winner-loser gap', whereby supporters of the winning party report higher satisfaction than supporters of the losing party, a gap that is more pronounced in majoritarian systems and attenuated in consensus-based, proportional systems (Anderson & Guillory, 1997). Portugal's proportional electoral system makes this framework relevant. This dissertation tests a related but distinct variable - participants' declared party proximity - which does not identify whether their preferred party won or lost a given election.

Region is a relevant factor in Portugal, given well-documented socio-economic regional disparities between the coast and the interior, and between North and South (Silva & Ribeiro, 2014). The literature on 'forgotten places' - post-industrial towns, cities and some rural areas characterised by poor economic performance - links these peripheral regions to political discontent and populist voting, attributed to a perceived neglect by metropolitan elites (Rodríguez-Pose, 2018).

In Portugal, gender has generally not been found to be a significant predictor of satisfaction with democracy (Gorbunova & Raimundo, 2013; Sanches & Gorbunova, 2016), nor of 'discontent', a factor index encompassing dissatisfaction with democracy (Magalhães, 2005).

Electoral participation has been associated with greater satisfaction, with panel data suggesting that voting itself increases satisfaction among all participants in elections, even those who voted for the losing party, though the effect is larger for supporters of the winning party (Kostelka & Blais, 2018). Ferreira da Silva (2025), using Portuguese data, tested whether satisfaction predicts electoral participation.

Finally, government evaluation is a variable for which an extensive literature links favourable assessments of the incumbent to greater satisfaction with democracy (Christmann, 2018; Christmann & Torcal, 2017), with the latter authors showing that changes in government evaluation are associated with changes in satisfaction. This reinforces Magalhães's (2005) argument that the two variables share the same latent dimension, discontent, a pattern consistent with the coexistence, in several countries, of strong support for institutions and equally strong dissatisfaction with their performance (Diamond, 2001, as cited in Magalhães, 2005).

Based on the literature reviewed, this dissertation examines whether satisfaction with democracy in Portugal is better understood as reflecting age-related life-course patterns, generational socialisation, electoral-period contexts, or individual psychosocial and political characteristics. The following research question and hypotheses guide the empirical analysis:

RQ1: Are variations in satisfaction with democracy in Portugal between 2002 and 2025 more consistent with life-course, generational, or electoral-period patterns?

H1: Satisfaction with democracy is expected to vary with age, reflecting differences in life stage, social integration, institutional experience, and perceived stability.

H2: The association between age and satisfaction with democracy is expected to be non-linear, rather than strictly linear.

H3: Cohorts socialised in different political and economic contexts are expected to differ in satisfaction with democracy.

H4: Satisfaction with democracy is expected to vary across election years, reflecting the influence of broader political, economic, and institutional contexts on citizens' evaluations of democratic performance.

H5: More favourable evaluations of government performance are expected to be associated with higher satisfaction with democracy and to account for part of the observed election-year differences.

H6: Indicators of psychosocial, social, and political integration, including education, employment status, electoral participation, party proximity, religious attendance, and region, are expected to be associated with satisfaction with democracy.

Method

Study design

This study employed a quantitative and observational design using secondary repeated cross-sectional data from the Portuguese Election Study (PES). The analytical dataset combines the harmonised 2002-2024 PES dataset prepared by Silva (2026), based on previous PES post-election surveys (Lobo et al., 2024), with the 2025 PES post-election data (Lobo et al., 2025), covering nine Portuguese legislative elections between 2002 and 2025.

An approach inspired by the APC perspective was used, adopted in an exploratory manner given the identification problem between age, period and cohort. This approach considers three time-related dimensions central to this dissertation: age effects, relating to variations associated with the life cycle that individuals go through as they age; period effects, linked to changes in social, cultural or physical contexts at the time of elections, which affect all age groups in a society simultaneously; and cohort effects, relating to the shared experiences of individuals born in the same time period (Yang & Land, 2008; Wong et al., 2017).

The database captures temporal dynamics across nine parliamentary elections over 23 years, but does not follow the same participants over time.

Participants and data

Data were drawn from the post-election surveys of the Portuguese Election Study (Lobo et al., 2024; Lobo et al., 2025). The database initially comprised 13,347 participants, distributed across election years as follows: 1,303 in 2002, 2,700 in 2005, 1,317 in 2009, 1,000 in 2011, 1,499 in 2015, 1,500 in 2019, 1,010 in 2022, 1,001 in 2024, and 2,017 in 2025 (these sample sizes differ from those in Table 3, which reports only the cases with valid responses on the dependent variable). The data source contains information from questionnaires completed by participants residing in mainland Portugal who were aged 18 or over at the time of completion.

Operationalisation of variables

Dependent variable

The dependent variable was satisfaction with democracy, measured through a single self-report item on a four-point ordinal scale. The original response scale was subsequently recoded so that higher values correspond to greater satisfaction (1 = *not at all satisfied*, 2 = *not very satisfied*, 3 = *fairly satisfied*, 4 = *very satisfied*).

Differences were found in the coding of the scale across the 2002–2024 and 2025 datasets. Consequently, the recoding was carried out differently for the two datasets to ensure comparability of the variable throughout the analysed period.

Temporal Independent Variables

Age

Age is one of the independent variables in this study and was operationalised in different ways depending on the model. Continuous age, measured in years, was included in the simple age models, as was its quadratic term, to test whether the relationship with satisfaction with

democracy was linear or curvilinear. In the full model, age was also included in both continuous and quadratic forms, centred on the sample mean to reduce collinearity between the linear and quadratic terms.

In addition to the continuous operationalisation, age was also used as a categorical variable in two models: the natural age-group model, which distinguishes between participants aged 18 to 29 and those aged 30 or over in each election, thereby testing the life-cycle hypothesis; and the synthetic cohort model, which tracks over time the cohort aged 18 to 29 in 2002 and the cohort aged 30 or over that year, thereby testing the cohort effect.

Election Period

Electoral year was included as a categorical variable, identifying the election in which each participant was surveyed: 2002, 2005, 2009, 2011, 2015, 2019, 2022, 2024 or 2025. In the full model, 2002 was the reference category, being the first election of the series, so that the coefficient for each year estimated its difference from 2002. Election year was also included in the interaction terms with the natural age group and the synthetic cohort, to test whether the difference between groups varied across the years.

Cohort

The cohort variable was operationalised categorically, with five levels, and each participant was assigned to a birth cohort based on their estimated year of birth, calculated by subtracting their age from the election year in which they were surveyed. The cut-off points followed the generational definitions of the Pew Research Center (Dimock, 2019): the Pre-1945 Generation, for participants born in 1945 or earlier; the Baby Boomer Generation, born between 1946 and 1964; Generation X, born between 1965 and 1980; the Millennials, 1981 and 1996; and Generation Z, born in 1997 or later.

These categories were originally developed for the American context and are based on historical and political events specific to the United States, which may not correspond directly to the Portuguese case. They were retained here, in the absence of an established Portuguese-specific alternative, to allow comparability with the broader literature. The categories should be interpreted considering events more directly relevant to political socialisation in Portugal, such as the Estado Novo dictatorship, the transition to a democratic regime in 1974, accession to the European Economic Community, and the economic and political crisis of 2011.

Control variables

Sociodemographic and attitudinal control variables were also included, both to estimate the temporal effects (age, period, and cohort) while holding other individual characteristics constant, and to assess their own association with satisfaction with democracy.

Gender was operationalised as a dichotomous variable, recoded from the original 1/2 coding to 0 = male, 1 = female, with male as the reference category.

Educational attainment was recoded into three categories (1 = low education, 2 = medium education, 3 = high education) and entered as a categorical variable in the models, with low education as the reference category. Although ordinal, the distances between categories are not assumed to be equal; the estimated coefficients therefore represent the difference between each category and the lowest education level, rather than a linear effect across the three levels. Employment status was similarly recoded into three categories (1 = employed, 2 = unemployed, 3 = economically inactive), and entered as a categorical, nominal variable, with employed as the reference category, given that these categories have no natural ordering.

Religious attendance was treated as an ordinal variable, measuring the frequency of attendance at religious services, with six levels: 1 = *never*, 2 = *once a year*, 3 = *two to eleven times a year*, 4 = *once a month*, 5 = *two or more times a month*, 6 = *once a week or more*. Thus, higher values indicate greater religious attendance. A categorical sensitivity analysis indicated some deviation from linearity: the effect increased up to *once a month*, then levelled off or slightly declined at higher levels of attendance. Results for this variable should be interpreted cautiously.

To capture whether participants voted, electoral participation was operationalised as a dichotomous variable (0 = did not vote, 1 = voted), with did not vote as the reference category.

Measured on a five-point scale assessing the government's performance in office at the time of the election, government evaluation was coded so that higher values corresponded to a more favourable assessment (1 = *very bad*, 2 = *bad*, 3 = *neither good nor bad*, 4 = *good*, 5 = *very good*). The intermediate category had no valid observations in the harmonised dataset, leaving four observed levels. Given this discontinuity in the scale, treating the variable as

numerical, as with religious attendance, was considered inappropriate; it was instead entered as an ordered categorical variable, with linear, quadratic, and cubic polynomial contrasts.

Party proximity was operationalised as a categorical variable, asking participants whether they felt close to a political party and, if so, to which. This was recoded into three levels: 0 = no party proximity, 1 = left, 2 = right. The parties were grouped according to the ideological classification by Lobo (2024) and Costa et al. (2026), with no party proximity as the reference category.

The region was included as a territorial control variable and operationalised by creating two dummy variables: one for participants from the North region and the other for participants from the remaining regions (the Centre, the Alentejo, and the Algarve). Greater Lisbon was used as the reference category, since it is the country's administrative and economic centre, allowing a substantively relevant comparison point for other regions historically framed as more peripheral. The other regions category, while necessary given sample size constraints, aggregates territories that differ considerably from one another; this limits the ability to detect effects specific to any single region within this group, a limitation discussed further in the study's limitations.

Analytical strategy

All analyses were conducted in R [version 4.6.1] (R Core Team, 2026). Ordinal logistic regression models were estimated using the clm() function from the ordinal package, mixed-effects models using lmer() function from the *lme4* package and predicted probabilities and figures were generated using *ggplot2*. The analytical code is available from the author upon request.

Several models were estimated to test the hypotheses, increasing gradually in complexity to show how the effects of the time-dependent variables change as controls are introduced. H1 and H2 were tested by modelling age first as a continuous predictor and then with an added quadratic term. H3 was examined through the generation indicators and synthetic cohort specifications. H4 was tested by including election year as a period indicator. H5 was assessed by comparing the full model with and without government evaluation. H6 was examined in the full model, which included the psychosocial, social, and political predictors described above.

The first step involved estimating two simple age models. The first included age as a continuous variable, to test the linearity of the association. The second model added a quadratic age term, to test for a curvilinear trajectory. Curvature was assessed through the significance of this term, and a U-shaped trajectory was considered supported if three conditions were met: a positive quadratic coefficient with a negative linear term; a turning point within the observed age range; and predicted probabilities showing a decline followed by a rise across the age distribution.

Natural age-group and synthetic cohort specifications were then estimated to further distinguish age- and cohort-related patterns. Finally, a full model was estimated for 2002-2025, including centred linear and quadratic age terms, election year, generation, and the remaining control variables.

Since the dependent variable is a four-point ordinal scale, all models were estimated using ordinal logistic regression. The proportional odds assumption was only partially met; robustness to this violation was assessed through alternative specifications, as detailed in the Assumptions subsection of the Results (see Appendix E for full test results). Results were reported as odds ratios with 95% confidence intervals, supplemented with figures showing predicted probabilities where coefficients were not easily interpretable, particularly for quadratic and interaction terms.

As this study focuses on associations rather than population-level estimates, the main models were estimated without sampling weights. A weighted sensitivity analysis of the full model, using the PES-recommended weights (Lobo et al., 2024; Lobo et al., 2025), confirmed the substantive conclusions of the unweighted model. Standard errors were not grouped by election year, given the small number of survey waves.

Several robustness analyses were also conducted. The full model was re-estimated, excluding the government evaluation to assess how each year's effect was explained by this variable. An HAPC model was also estimated, with age as a fixed effect and period and cohort as crossed random effects, to explore the identification problem in APC models. Because the ordinal specification failed to converge, a linear specification was estimated as an exploratory alternative, and its coefficients were not directly comparable to those of the ordinal model.

Ethical framework

This dissertation drew on a secondary, anonymised data from the Portuguese Election Study (Lobo et al., 2024; Lobo et al., 2025); no further data were collected. Consequently, confidentiality was ensured, as no participant in the sample can be identified. The methods and analyses were reported transparently, and participant's privacy was safeguarded.

All data were used in this dissertation solely for academic and scientific purposes, in accordance with current standards for psychological research. The use of this information, as well as the conduct of this project, were previously reviewed and approved by the Ethics Committee of the Faculty of Psychology and Educational Sciences at the University of Porto (Ref.ª 2026-02-09).

Results

Sample characteristics

The total sample comprised 13,347 participants across nine legislative elections, of whom 10,013 were included in the full model after complete-case analysis. Descriptive statistics are reported in Appendix Table A1. Satisfaction with democracy was concentrated in the intermediate categories, with 43.6% of respondents *fairly satisfied* and 36.0% *not very satisfied*.

Complete-case analysis was conducted separately for each model, yielding distinct analytical samples (Appendix Table A2). The full model retained 10,013 participants (75.0% of the original sample). Differences between retained and excluded respondents were generally modest, although more pronounced for party proximity and electoral participation (Appendix Table A3).

Satisfaction with democracy varied across election years, with a decline through 2011 (M = 2.00, SD = 0.78), followed by an upward trend through 2022 (M = 2.62, SD = 0.77). However, a further decline was observed thereafter, with the final year covered by the dataset (M = 2.43, SD = 0.75) returning to the 2002 level (M = 2.43, SD = 0.82). Table 1 illustrates this variation across election years.

Table 1

Satisfaction with Democracy by Election Year

Election year	*n*	*M*	*SD*	Median	IQR
2002	1,229	2.43	0.82	3.00	1.00
2005	2,606	2.33	0.78	2.00	1.00
2009	1,286	2.19	0.84	2.00	2.00
2011	974	2.00	0.78	2.00	2.00
2015	1,468	2.25	0.78	2.00	1.00
2019	1,476	2.40	0.79	2.00	1.00
2022	989	2.62	0.77	3.00	1.00

Election year	*n*	*M*	*SD*	Median	IQR
2024	988	2.48	0.74	3.00	1.00
2025	1,976	2.43	0.75	3.00	1.00

Note. Values calculated for respondents with valid information on the dependent variable. The scale ranges from 1 (*not at all satisfied*) to 4 (*very satisfied*). Higher values indicate greater satisfaction. IQR = interquartile range (Q3 − Q1).

Age and Satisfaction with Democracy

To determine whether the relationship between the age variable and the dependent variable takes a non-linear form and test H1 and H2, two ordinal regression models were run: the first included only the age variable, while the second additionally included a quadratic age term.

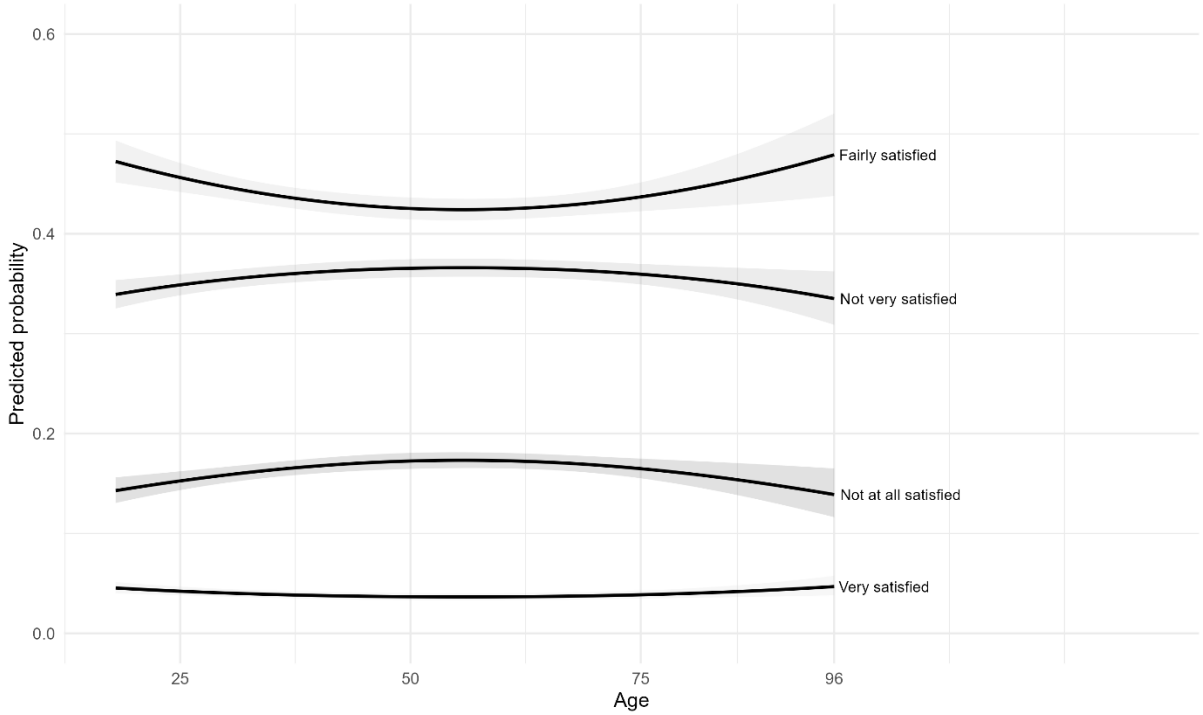
In Appendix Table B1, the age-only model suggested a weak, borderline evidence of a negative linear association (B = -0.00178, SE = 0.00092, OR = 0.9982, 95% CI [0.9964, 1.0000], p = .052).

In contrast, both age (B = -0.01794, SE = 0.00522, OR = 0.9822, 95% CI [0.9722, 0.9923], p < .001) and its quadratic term (B = 0.00016, SE = 0.00005, OR = 1.0002, 95% CI [1.0001, 1.0003], p = .002) were significant in the quadratic model. The negative linear and positive quadratic coefficients, together with a turning point at approximately 56 years within the observed age range, suggested a U-shaped association. Predicted probabilities of being fairly or very satisfied declined from 51.8% at age 18 to 46.1% at the turning point, before rising to 52.6% at age 96, indicating a modest curvature of approximately six percentage points. Model fit also improved with the quadratic specification (Akaike information criterion [AIC] = 29,953.20 versus 29,961.12 for the linear model).

Figure 1 shows the predicted probability of each satisfaction category as a function of age. Most curves showed limited variation, with *fairly satisfied* displaying the greatest amplitude. The extreme categories (*very satisfied* and *not at all satisfied*) had lower predicted probabilities than the intermediate ones (*fairly satisfied* and *not very satisfied*), with *very satisfied* remaining the least probable across the age range. The more favourable categories were more probable among the youngest and oldest participants, following a U-shaped curve, whereas the less favourable ones peaked around age 56.

Figure 1

Predicted Probability of Each Satisfaction Category by Age



Note. Predicted probabilities from the ordinal model with age and age squared (Appendix Table B1). No control variables were included. Shaded areas represent 95% confidence intervals.

Overall, these findings suggest that satisfaction varies with age in a non-linear, U-shaped pattern, supporting H1 and H2. As a complementary specification, age was categorised into young adults (18–29 years) and older respondents (30 years and above) in the natural age-group model, which showed no significant differences between the two groups, either in the reference year or across election years in the interaction terms (Appendix Table B1, B2 and B3).

Cohort and Satisfaction with Democracy

To examine H3, a synthetic cohort approach, as applied by Costa et al. (2026) to the Portuguese case, was used to track respondents who were aged 18 to 29 in the 2002 elections over time and across election waves. This division allowed differences between this cohort and

participants aged 30 or over in 2002 to be examined over time, assessing the existence of cohort differences in satisfaction with democracy.

Synthetic cohort model

Table 2 show the results of the synthetic cohort model, which follows the aggregate category of respondents who belonged to the 18-29 cohort in 2002 across subsequent election waves, allowing cohort effects to be distinguished from life-cycle effects.

Table 2

Synthetic Cohort Model of Satisfaction with Democracy

Predictor	*B*	*SE*	*OR* [95% CI]	*p*
Cohort aged 18–29 in 2002	0.024	0.152	1.02 [0.76, 1.38]	.876
Female	-0.051	0.040	0.95 [0.88, 1.03]	.195
Medium education	0.155	0.049	1.17 [1.06, 1.28]	.001
High education	0.471	0.063	1.60 [1.42, 1.81]	< .001
Unemployed	-0.210	0.072	0.81 [0.70, 0.93]	.004
Inactive	-0.001	0.046	1.00 [0.91, 1.09]	.991
Religious attendance	0.037	0.011	1.04 [1.01, 1.06]	.001
Voted	0.235	0.047	1.26 [1.15, 1.39]	< .001
Government evaluation (linear)	1.579	0.106	4.85 [3.95, 5.97]	< .001
Government evaluation (quadratic)	0.206	0.079	1.23 [1.05, 1.44]	.009
Government evaluation (cubic)	-0.107	0.044	0.90 [0.82, 0.98]	.016
Party proximity: left	0.458	0.047	1.58 [1.44, 1.73]	< .001
Party proximity: right	0.280	0.054	1.32 [1.19, 1.47]	< .001
Region: North	-0.160	0.048	0.85 [0.77, 0.94]	< .001
Region: Other	-0.089	0.049	0.91 [0.83, 1.01]	.068

Note. N = 10,013. Log-likelihood = -10,887.35; AIC = 21,835.67. The dependent variable is satisfaction with democracy, measured on an ordered four-point scale ranging from 1 (*not at all satisfied*) to 4 (*very satisfied*). Cumulative link model with logit link. Odds ratios above 1 indicate higher odds of being in a more satisfied category. Threshold parameters are omitted. CI = confidence interval. The model includes election-year fixed effects and interactions between cohort and election year; interaction terms are reported in Appendix Table C1. The reference year is 2002; the remaining coefficients represent average effects across the period. Reference categories: aged 30 or over in 2002, male, low education, employed, did not vote, no party proximity, Greater Lisbon. Government evaluation was entered as an ordered categorical predictor (linear, quadratic, and cubic contrasts); the reference is the lowest observed category (very bad).

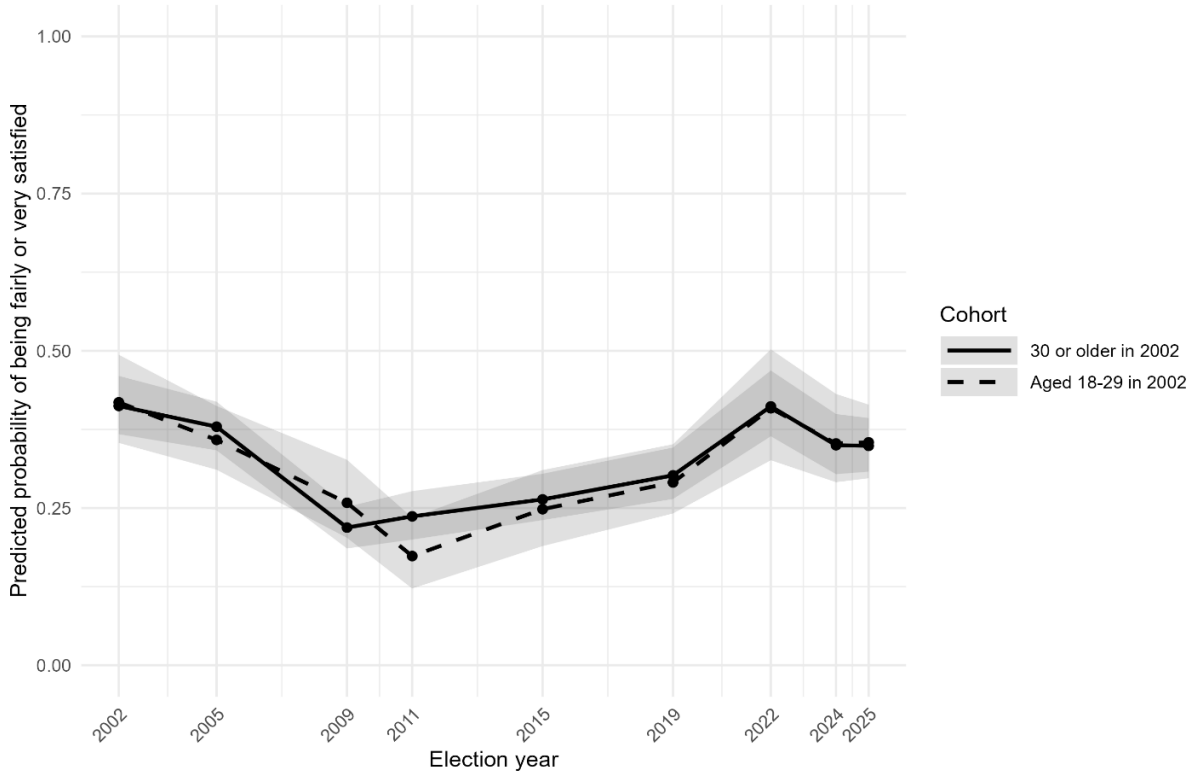
There was no significant main effect of cohort (*B* = 0.024, *SE* = 0.152, *OR* = 1.02, 95% CI [0.76, 1.38], *p* = .876), providing no evidence of a significant difference in satisfaction with democracy in 2002 between those aged 18 to 29 and the reference cohort (30 or over), after accounting for the covariates. The interaction terms between cohort and election year (Appendix Table B2) confirm that this absence of difference remained consistent over time, with none reaching significance. The coefficient for 2011 came closest to the threshold (*B* = -0.413, *SE* = 0.255, *OR* = 0.66, 95% CI [0.40, 1.09], *p* = .105) but remained non-significant. Overall, these findings did not support H3, as there was no evidence of cohort differences in satisfaction with democracy.

The model fit was virtually identical to the natural age group specification (Appendix Table B1) (AIC = 21,834.99 and 21,835.67, respectively; reported to two decimals because the models differ by less than one unit), despite the different operationalisation of age. Neither model identified any significant differences across the years covered.

Figure 2 illustrates the predicted probabilities by cohort, which followed the same temporal trajectory across the nine election years, with the confidence intervals overlapped sistematically: satisfaction declined until 2009, fell further for the younger cohort in 2011, recovered through 2022, and declined again in 2024 and 2025 – though the larger 2011 drop for the younger cohort was not reflected in a significant coefficient. These results do not support age- or cohort-related differences in satisfaction with democracy, suggesting instead that the observed variation is primarily driven by period effects.

Figure 2

Predicted Probability of Being Fairly or Very Satisfied With Democracy, by Synthetic Cohort



Note. Predicted probabilities from the synthetic cohort ordinal model (Table 2), obtained by summing the two highest satisfaction categories. The solid line represents the cohort aged 30 or older in 2002; the dashed line represents the cohort aged 18–29 in 2002, tracked across subsequent elections. Categorical variables were held at their reference categories, except government evaluation, held at its modal category (*bad*); continuous variables at their sample mean. Shaded areas are 95% percentile confidence bands obtained by case-resampling bootstrap (500 resamples), refitting the model on each resample and recomputing the summed probability. Interaction terms are reported in Appendix Table C1.

Electoral context and satisfaction with democracy

Full Model 2002–2025

The preceding analyses examined age, cohort and election year separately. The full model integrates them simultaneously, together with the covariates described in the Method. Age and its quadratic term were centred on the sample mean to facilitate interpretation and reduce multicollinearity between both terms. Table 7 presents the results of this model.

Table 3

Full Ordinal Model of Satisfaction with Democracy

Predictor	*B*	*SE*	*OR* [95% CI]	*p*
Age (centred)	0.004	0.004	1.00 [1.00, 1.01]	.307
Age squared (centred)	0.000	0.000	1.00 [1.00, 1.00]	.072
2005	-0.178	0.079	0.84 [0.72, 0.98]	.024
2009	-0.899	0.095	0.41 [0.34, 0.49]	< .001
2011	-0.899	0.103	0.41 [0.33, 0.50]	< .001
2015	-0.737	0.101	0.48 [0.39, 0.58]	< .001
2019	-0.566	0.112	0.57 [0.46, 0.71]	< .001
2022	-0.093	0.123	0.91 [0.72, 1.16]	.451
2024	-0.357	0.126	0.70 [0.55, 0.90]	.005
2025	-0.364	0.121	0.69 [0.55, 0.88]	.003
Baby Boomers	0.140	0.092	1.15 [0.96, 1.38]	.128
Generation X	0.273	0.147	1.31 [0.98, 1.75]	.064
Millennials	0.295	0.199	1.34 [0.91, 1.98]	.138
Generation Z	0.375	0.263	1.45 [0.87, 2.44]	.154
Female	-0.052	0.040	0.95 [0.88, 1.03]	.187
Medium education	0.118	0.052	1.12 [1.02, 1.25]	.024
High education	0.425	0.067	1.53 [1.34, 1.74]	< .001
Unemployed	-0.213	0.072	0.81 [0.70, 0.93]	.003
Inactive	-0.007	0.057	0.99 [0.89, 1.11]	.899
Religious attendance	0.039	0.011	1.04 [1.02, 1.06]	< .001
Voted	0.258	0.048	1.29 [1.18, 1.42]	< .001
Government evaluation (linear)	1.571	0.106	4.81 [3.91, 5.93]	< .001
Government evaluation (quadratic)	0.212	0.079	1.24 [1.06, 1.45]	.007
Government evaluation (cubic)	-0.109	0.044	0.90 [0.82, 0.98]	.014
Party proximity: left	0.462	0.047	1.59 [1.45, 1.74]	< .001
Party proximity: right	0.283	0.054	1.33 [1.19, 1.48]	< .001
Region: North	-0.170	0.049	0.84 [0.77, 0.93]	< .001
Region: Other	-0.089	0.049	0.91 [0.83, 1.01]	.067

Note. N = 10,013. Log-likelihood = -10,882.45; AIC = 21,826.89. The dependent variable is satisfaction with democracy, measured on an ordered four-point scale from 1 (*not at all satisfied*) to 4 (*very satisfied*). Cumulative link model with logit link. Odds ratios above 1 indicate higher odds of being in a more satisfied category. Threshold parameters are omitted. CI = confidence interval. Age was centred on the sample mean (M = 50.37); the quadratic term was computed from the centred variable. Reference categories: 2002, Pre-1945, male, low education, employed,

Predictor	*B*	*SE*	*OR* [95% CI]	*p*

did not vote, no party proximity, Greater Lisbon. Government evaluation was entered as an ordered categorical predictor using linear, quadratic, and cubic polynomial contrasts..

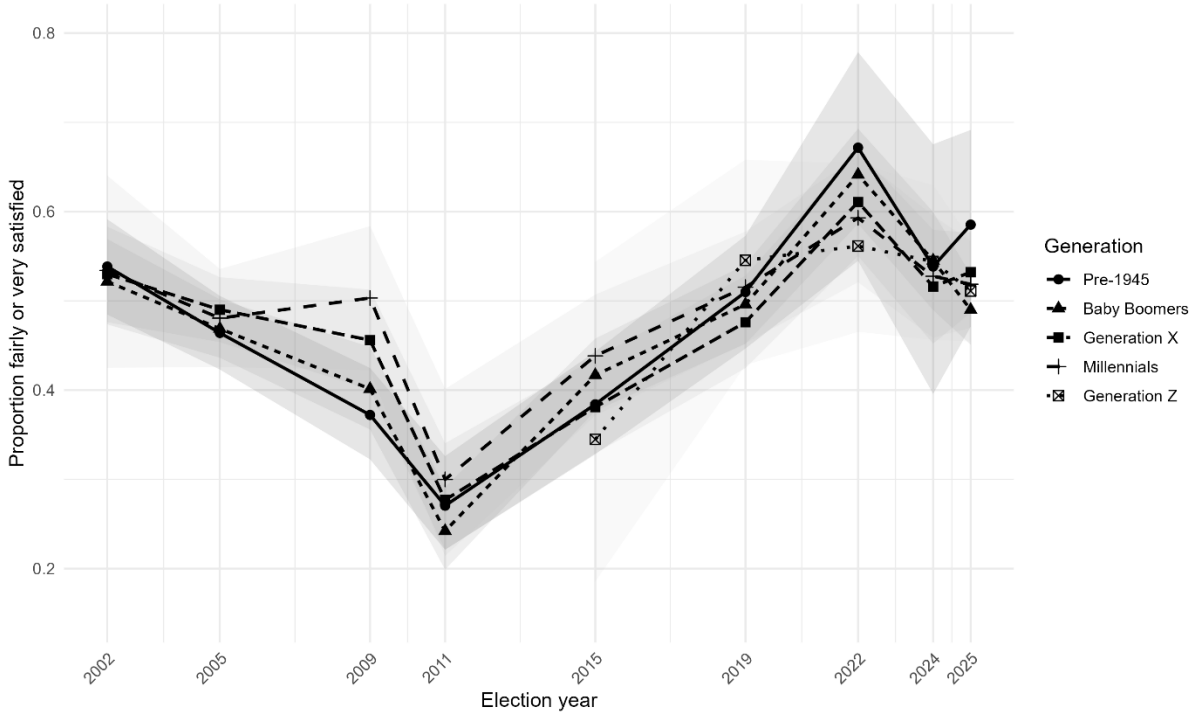
Relative to 2002, satisfaction with democracy was significantly lower in all years except 2022 (*B* = -0.093, *SE* = 0.123, *OR* = 0.91, 95% CI [0.72, 1.16], *p* = .451). The largest differences and most negative coefficients were observed in 2009 (*B* = -0.899, *SE* = 0.095, *OR* = 0.41, 95% CI [0.34, 0.49], *p* < .001) and 2011 (*B* = -0.899, *SE* = 0.103, *OR* = 0.41, 95% CI [0.33, 0.50], *p* < .001) both indicating 59% lower odds of being in a more satisfied category than in 2002. Satisfaction then recovered gradually in 2015 and 2019 (52% and 43% lower odds, respectively), reaching a non-significant difference in 2022, before declining again in 2024 and 2025, with 30% and 31% lower odds of satisfaction, respectively. Overall, these results suggested a period effect, with a meaningful variance pattern in satisfaction across electoral contexts and supported H4.

Regarding age, neither centred age (*p* = .307) nor its squared term (*p* = .072) was significant after accounting simultaneously for election year, generation and the remaining control variables, providing no evidence that satisfaction with democracy varied with age. Thus, the age effects observed in the previous models were not robust to the inclusion of other components of the full model. Although H1 and H2 were supported in the age-only models, the full model provides no additional evidence of age effects.

No evidence of a cohort effect was found, as none of the generations differed significantly from the reference group (Pre-1945) across election years (Figure 3). Thus, H3 was not supported in the full model.

Figure 3

Proportion of Respondents Fairly or Very Satisfied With Democracy, by Generation and Election Year



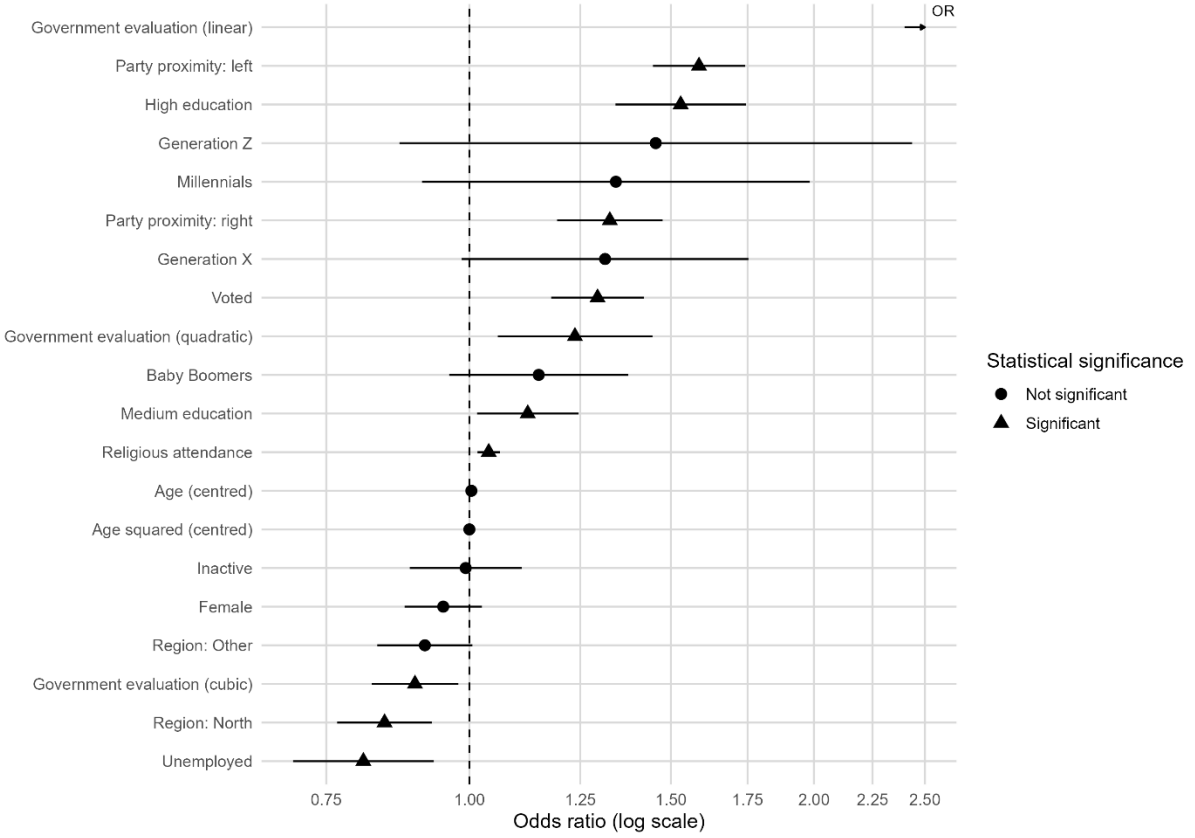
Note. Observed proportions, not adjusted for covariates. Generation Z is absent before 2015 and the Pre-1945 generation has few respondents in the most recent elections; group sizes are reported in Appendix Table D1. Shaded areas represent 95% confidence intervals. The vertical axis does not display the full 0–1 range.

Figure 4 shows the magnitude, significance and direction of each predictor. Participants in the North had 16% lower odds of greater satisfaction than those in Greater Lisbon (B = -0.170, SE = 0.049, OR = 0.84, 95% CI [0.77, 0.93], $p < .001$), whereas other regions did not differ significantly ($p = .067$).

Government evaluation was strongly associated with satisfaction with democracy. The positive linear contrast (B = 1.571, SE = 0.106, $p < .001$) indicated that more favourable evaluations were associated with greater satisfaction, while significant quadratic (B = 0.212, SE = 0.079, $p = .007$), and cubic (B = -0.109, SE = 0.044, $p = .014$), contrasts indicated that this association was not strictly linear. Party proximity (both left and right), medium and high education, electoral participation, and religious attendance were also positively associated with satisfaction, compared to reference groups, whereas unemployment was negatively associated with it, having 19% lower odds of greater satisfaction than employment. Gender, inactivity, cohort, age and the other regions were not significant predictors. Overall, these findings provide partial support for H6, as some indicators of psychosocial, social, and political integration were significantly associated with satisfaction, whereas others were not.

Figure 4

Odds Ratios for the Predictors of Satisfaction With Democracy



Note. Odds ratios with 95% confidence intervals from the full ordinal model. The dashed line indicates an odds ratio of 1. Triangles denote predictors significant at $p < .05$, whereas circles denote non-significant predictors. The horizontal axis is logarithmic and capped at 2.50 for readability; the linear contrast of government evaluation (*OR* = 4.81, 95% CI [3.91, 5.93]) extends beyond this range and is marked with an arrow. Odds ratios for continuous predictors represent to a one-unit increase on the respective scale and are not directly comparable with those of categorical predictors, including the polynomial contrasts for government evaluation. Election-year fixed effects are included in the model and reported in Table 3.

The full model thus revealed that, when the three APC components were included simultaneously, neither age nor generation was significantly associated with satisfaction with democracy. Election period and individual characteristics, however, were significantly associated with satisfaction.

The role of government evaluation in the period effect

Government evaluation was a significant and positive predictor across all model specifications and the strongest predictor on its scale. As discussed above, both this variable and satisfaction with democracy are conceptually closer to specific support than to diffuse support, suggesting that they may partly capture the same underlying dimension. To examine whether government evaluation accounted for part of the observed election-year differences, the full model was re-estimated excluding this variable, allowing the election year coefficients to be compared across specifications.

Table 4

Election-Year Coefficients With and Without Control for Government Evaluation

Election year	Mean government evaluation	Without control		With control	
		B	*p*	*B*	*p*
2002	2.26	0.000	—	0.000	—
2005	1.97	-0.282	< .001	-0.178	.024
2009	2.84	-0.615	< .001	-0.899	< .001
2011	2.02	-0.951	< .001	-0.899	< .001
2015	2.74	-0.504	< .001	-0.737	< .001
2019	3.38	-0.087	.429	-0.566	< .001
2022	3.42	0.412	< .001	-0.093	.451
2024	2.96	-0.039	.756	-0.357	.005
2025	2.79	-0.121	.312	-0.364	.003

Note. N = 10,013. Cumulative link model with logit link. The reference year is 2002 (coefficient fixed at zero in both specifications). Coefficients are log-odds of satisfaction with democracy relative to 2002. The 'Without control' columns correspond to the full ordinal model excluding government evaluation; the 'With control' columns correspond to the full ordinal model reported in Table 3. AIC = 21,826.89 with control and 22,412.13 without control. The descriptive correlation between the mean government evaluation and the magnitude of the adjustment to each year's coefficient is r = -.998. Mean government evaluation ranges from 1 (very bad) to 5 (very good).

Table 4 showed that controlling for government evaluation substantially altered the election-year coefficients, although the extent of this adjustment varied across elections. The clearest contrast was between 2011 and 2022. In 2022, which had the highest average government evaluation (3.42), the election-year coefficient was positive and significant without the control (B = 0.412, p < .001), indicating higher satisfaction with democracy than in the reference year, but became non-significant after its inclusion (B = -0.093, p = .451), suggesting

that government evaluation accounts for a substantial part of the higher satisfaction observed in 2022. However, 2011 had the second-lowest mean government evaluation (2.02) and the largest negative coefficient without the control (B = -0.951, p < .001). After controlling for government evaluation, the coefficient remained almost unchanged (B = -0.899, p < .001), suggesting that the low satisfaction observed in 2011 cannot be explained by government evaluation alone, and pointing to a period effect that extends beyond dissatisfaction with the executive in office.

Overall, these findings supported H5, as more favourable government evaluations were associated with higher satisfaction with democracy and accounted for part of the observed election-year difference. In years where the election-year coefficient was significant without controlling for government evaluation but became non-significant after its inclusion, such as 2022, the observed difference from 2002 appears to be largely accounted for by government evaluation. In contrast, where significant election-year differences persisted after controlling for government evaluation, such as in 2011, other period-specific factors may have contributed to the observed variation in satisfaction.

Assumptions

The ordinal model rests on five assumptions (Appendix Table E1). The proportional odds assumption was violated for five of the thirteen predictors: generation (p = .008), government evaluation (p < .001), party proximity (p = .019), North region (p < .001), and other regions (p = .008); the test for election year did not converge, given its large number of categories (Appendix Table E2). A partial proportional odds model, allowing these five predictors to vary across thresholds, confirmed the substantive conclusions of the main model: government evaluation and party proximity remained significant predictors across thresholds, generation remained largely non-significant, and regional effects were more pronounced at higher thresholds (Appendix Table E3).

Independence of observations was a limitation because the nine election waves shared a common context, so responses were not fully independent. The median ratio between cluster-robust and conventional standard errors was 0.86. High multicollinearity was found only between centred age and its quadratic term, as expected from their construction. The remaining assumptions were met.

Robustness checks and Model performance metrics

As a robustness check addressing the sparse extreme categories of the dependent variable, the APC and HAPC models were re-estimated using a binary measure of satisfaction with democracy (0 = *not satisfied*; 1 = *satisfied*). The substantive conclusions remained unchanged, providing additional support for the findings reported in the main analyses. Full results are reported in Appendix Tables F1 and F2.

Appendix Table H1 presents complementary metrics to assess the predictive power of this model. Nagelkerke's pseudo-R^2 was .13, while McFadden's R^2 was .06. Classification accuracy was modest (.49), and Kendall's tau of .27 reflects a weak-to-moderate association. Taken together, these metrics indicate statistically detectable but substantively modest explanatory performance, suggesting that satisfaction with democracy is influenced by factors beyond those captured by the predictors included in this study.

Discussion

This study examined whether satisfaction with democracy in Portugal is more closely associated with life-course, cohort, or electoral-period patterns, while also considering individual psychosocial, social, and political characteristics. Overall, the findings point to the greater importance of period variation than of age or cohort differences. The results indicate that dissatisfaction is responsive to the political and institutional circumstances in which citizens evaluate democratic performance. Individual characteristics were also associated with Satisfaction appears responsive to the political and institutional circumstances, while individual characteristics were also associated with this variable.

The strongest evidence for the importance of context concerns the period effect. The low levels in 2009 and 2011 coincide with the economic crisis in Southern Europe, including the *troika* intervention and austerity measures in Portugal that literature has associated with lower satisfaction with democracy (Kriesi, 2020; Torcal, 2014). The subsequent recovery is also consistent with evidence of recovering political trust in Portugal (Christmann et al., 2025), and the weakening of crisis-related effects over time (Quaranta et al., 2021). These findings support the interpretation that satisfaction is sensitive to broader political and economic conditions.

This pattern of decline coincides with the economic crisis in Southern Europe, including Portugal. Armingeon and Guthmann (2014) found that satisfaction with democracy declined in almost all European Union countries between autumn 2007 and 2011. Teixeira et al. (2019) showed that the gap between diffuse support for democracy and dissatisfaction with its performance peaked during Portugal's *troika* bailout period (2011-2014). Some evidence, however, suggests that citizens' support for democracy was higher in countries subject to external financial bailouts (Cordero & Simón, 2016), as they attributed blame to the external entities responsible rather than to the democratic system itself.

A clearer suggestion of the mechanisms underlying period differences emerged from the contrast between 2011 and 2022. Government evaluation accounted for the positive election-year difference observed in 2022, but not for the negative difference in 2011. Consistent with Easton's (1965, 1975) distinction between specific and diffuse support, satisfaction in 2022 appears closely linked to government performance, whereas dissatisfaction in 2011 may reflect broader concerns about the functioning of democratic institutions. This finding aligns with evidence that citizens may not always distinguish government performance from regime performance (Aarts & Thomassen, 2008) and with Torcal's (2014) argument that declining political trust in Portugal and Spain during 2011-2012 reflected perceptions of institutional unresponsiveness and inappropriate elite behaviour.

The age results gave a more qualified picture. A curvilinear, U-shaped association emerged in the quadratic term, but this pattern was no longer detectable in the full model once other predictors were considered simultaneously. The findings suggest that apparent age differences may partly reflect the contexts in which different age groups are observed. This is compatible with the mixed evidence from Portugal, where positive age associations have been found in some periods but not others (Gorbunova and Raimundo, 2013; Teixeira et al., 2014). H1 and H2 were supported in the age-only models, but the absence of significant age differences in the full model limits the evidence for a life-course effect on satisfaction.

The absence of evidence of a cohort effect in this study challenges the idea that younger generations are becoming more dissatisfied with democracy. These findings contrast with research reporting a generational decline in satisfaction (Foa & Mounk, 2016; Foa et al., 2020), and with Portuguese evidence from Sanches and Gorbunova (2016) who found evidence of a cohort effect, with the post-transition cohort (born after 1974) showing higher specific support than those partially or fully socialised under the Estado Novo. However, the results are

consistent with studies that found little evidence of a systematic generational erosion (Zilinsky, 2019; Wuttke et al, 2022; Norris, 2017; Voeten, 2016; Inglehart, 2016). H3 was not supported.

Beyond these temporal patterns, several individual characteristics were associated with satisfaction. Education showed a significant positive association, as more educated participants reported greater satisfaction, which is consistent with Portuguese literature (Gorbunova & Raimundo, 2013; Gorbunova et al., 2015), but contrasts with the critical citizens thesis, which predicts that higher education is associated with greater cognitive mobilisation that should lead to more demanding evaluations of democratic performance (Inglehart, 1997; Norris, 1999). The Portuguese evidence provides limited support for this mechanism, as it does not appear to operate as expected in Portugal (Teixeira et al., 2014). These findings therefore suggest that higher education is not necessarily associated with greater dissatisfaction; it may instead be associated with resources or political integration that leads to more favourable evaluations.

Government evaluation emerged as one of the strongest positive predictors in the model. Aarts and Thomassen (2008) argue that, particularly in newer democracies, citizens find it harder to distinguish the performance of the incumbent government from that of the democratic regime, which is consistent with the conceptual proximity between the two variables. Christmann and Torcal (2017), found that evaluations of the political process are as relevant as economic performance in explaining satisfaction with democracy, contradicting the dominant paradigm, which attributes such variation primarily to the economy.

Employment was a significant predictor, with unemployed participants reporting lower satisfaction than the employed ones, which is consistent with the evidence from Western Europe (Friedrichsen & Zahn, 2014), and may reflect the social integration associated with employment, in contrast with the greater precarity faced by the unemployed (Wroe, 2014). These results suggest that satisfaction with democracy are not independent of citizens' socioeconomic circumstances.

Party proximity was one of the strongest individual predictors, with either left- or right-wing party proximity associated with higher satisfaction than those with no proximity. This is only partially consistent with the 'winner-loser gap' reported in the literature, whereby supporters of the winning party in the election tend to be more satisfied than supporters of defeated parties (Anderson & Guillory, 1997; Kostelka & Blais, 2018). Because this coefficient measure party proximity rather than support for the winning party, and because analysis

combines nine elections in which different parties and political blocs won, any winner-loser asymmetry may have been attenuated.

The regional result points to another dimension of political experience. Lower satisfaction in the North relative to Greater Lisbon is consistent with Portugal's persistent regional asymmetries (Silva & Ribeiro, 2014) and with evidence linking territorial disadvantage and perceived neglect to political discontent and rising support for populist movements (Kenny & Luca, 2021; Rodríguez-Pose, 2018). However, the non-significant effect for other regions may result from aggregating heterogeneous territories.

Religious attendance emerged as a predictor positively associated with satisfaction. This finding is compatible with research linking religious participation to social integration and with the social capital theory, that suggests rich associative networks generate interpersonal trust, collaboration and reciprocity, fostering more favourable political attitudes (Putnam, 1993; Friehe & Pfeifer, 2024). Separately, it has also been proposed that more religious individuals attribute more the responsibility for national events to a divine entity, reducing their tendency to hold the government accountable for performance (Just, 2018). Norris (2001) challenged the social capital theory, finding that the association between social capital and socioeconomic and institutional development is driven by social trust rather than by associational networks, with belonging and membership measures rarely reaching significance. As this dissertation measures the frequency of religious attendance rather than interpersonal trust, the significant coefficient found here may reflect a different mechanism from social trust.

Electoral participation was associated with greater satisfaction: voters reported significantly higher levels than non-voters, consistent with Kostelka and Blais (2018), who find that participation affects satisfaction, but not the reverse. This finding should be interpreted with caution, however, given the possibility of prior satisfaction may also influence the decision to vote. Using the same dataset, Ferreira da Silva (2026) tested the reverse direction, that is, whether satisfaction predicts participation, and found a negative, inconsistent effect.

These individual-level result supported partially H6, as the pattern is not one of uniformly greater satisfaction among socially or politically integrated citizens, but rather of several associations operating alongside contextual variation. This conclusion reinforces that variation in satisfaction with democracy cannot be solely explained by individual characteristics or electoral context alone.

Taken together, these results answer the central research question suggesting that satisfaction with democracy in Portugal between 2002 and 2025 appears more closely associated with changing electoral and political contexts than with life-course or cohort patterns. Regarding the hypothesis, H1 and H2 were supported in the linear and quadratic age models, but this associations were not robust in the full model, H3 was not supported, H4 and H5 was supported, and H6 was partially supported.

Conclusion

The findings of this dissertation suggest that satisfaction with democracy in Portugal is more closely associated with specific electoral periods and political contexts, than with life-course or cohort differences. Satisfaction declined markedly during the 2009-2011 economic and financial crisis, subsequently recovered until 2022, and declined again in 2024 and 2025. Across the various model specifications, evidence for period differences was more consistent than evidence for age or cohort differences.

Age was operationalised in several distinct ways, as a continuous linear term, with an additional quadratic term, and as a categorical natural age-group. The quadratic model indicated a modest U-shaped association, with a turning point around age 56, but this pattern was not retained in the full model. The natural-age-group provided no evidence of differences between younger and older respondents, not confirming the life-cycle hypothesis, while the synthetic cohort also did not found cohort differences. Overall, age effects were not robust across these specifications, whereas the full model provided consistent evidence of a period effect. These findings contrast with some literature suggesting greater dissatisfaction among younger generations.

Several individual variables were also associated with satisfaction. More favourable government evaluations, higher education, party proximity, electoral participation, and religious attendance were positively associated with the dependent variable, while unemployment and North region were associated with lower satisfaction. Gender and other regions did not differ significantly from satisfaction. These results partially suggest that the variation in the dependent variable reflects both contextual and individual-level differences.

Given the conceptual proximity between government evaluation and satisfaction with democracy (both closer to specific than to diffuse support), the full model was re-estimated

excluding government evaluation. The findings suggested that this variable accounted for part of the observed period variation. In 2022, the positive election-year coefficient became non-significant after controlling for government evaluation, whereas the negative 2011 coefficient remained virtually unchanged. This difference suggests that the higher satisfaction observed in 2022 was closely associated with favourable evaluations of the government, while the lower satisfaction in 2011 cannot be attributed solely to unfavourable evaluations of the government, pointing instead to a broader period effect linked to the economic crisis and its consequences.

An HAPC model was also estimated as a complementary analysis, with period and cohort as crossed random effects and age as a fixed effect. However, the ordinal specification failed to converge, and a linear specification was estimated instead. Although not directly comparable in scale to fixed-effects models, it pointed in the same direction: cohort explained less variance than period.

The main contributions of this study consists in an extended longitudinal analysis of satisfaction with democracy in Portugal across nine consecutive legislative elections, held between 2002 and 2025, allowing to assess age, cohort and period patterns in the same work. Additionally, through multiple APC specifications and a complementary HAPC analysis, together with explicit assessment of model assumptions, performance, and robustness, this study provides consistent evidence for period patterns rather than age or cohort differences, highlighting the importance of the political and electoral context in which the functioning of the democratic regime is evaluated. Moreover, the results suggested that, in addition to contextual differences, there is individual-level associations which must be considered, contributing to a differentiated and broader perspective of satisfaction with democracy in Portugal.

Limitations and practical implications

Limitations

The use of repeated cross-sectional data, which does not track the same individuals over time, limits causal and longitudinal interpretation. This is particularly relevant to the life-cycle hypothesis, which presupposes change within the same individuals as they age. Results

should therefore be interpreted as aggregate patterns rather than evidence of individual trajectories.

The second limitation is that this is an observational study. Consequently, the results do not allow for causal inferences. The associations reported should not be interpreted as cause-and-effect relationships.

Another limitation relates to the APC model-based approach. Because age, period and cohort are mathematical interdependent, their effects cannot be definitively separated. Therefore, the results should be understood as evidence of temporal patterns, rather than as a causal decomposition of these three effects. The HAPC model provided a complementary approach, treating period and cohort as crossed random effects and age as a fixed effect, but does not definitively resolve the identification problem, relying on the assumption that the three effects follow a normal distribution with a mean of zero, which may not hold.

Satisfaction with democracy was self-reported and may be affected by response biases, including social desirability or social pressure that could lead participants to over- or underreport their satisfaction. The results should therefore be interpreted as self-reported satisfaction, since there is no direct, unmediated means of measuring underlying satisfaction.

A complete-case analysis reduced the sample size and may have introduced bias if missingness was not random. Although differences between retained and excluded participants were limited for most variables, greater caution is warranted for party proximity, electoral participation, and period. The consistency of the main findings across robustness analysis provides some reassurance.

Generation Z was observed only from 2015 onwards, the year its first members turned 18, leaving limited age variation within the generation and making age and period effects difficult to distinguish. Its smaller sample size in the earlier years also reduces estimate precision, so results for this group should be interpreted cautiously.

The significant association between satisfaction with democracy and government evaluation may also be partly inflated by common method variance, as both were measured in the same questionnaire with similar questions.

Harmonising educational attainment and religious attendance across waves required coding decisions, because of differences in question wording and coding. These decisions may have introduced uncertainty into the corresponding estimates.

Finally, although main models were estimated without sampling weights, as the study focuses on associations between variables rather than on population-level estimates, a weighted sensitivity analysis of the full model confirmed that the key findings were robust to this choice, with only minor differences in magnitude for regional effects. The absence of weighting in the remaining models (the natural age-group, synthetic cohort, and HAPC specifications) was not similarly tested, and results from these models should be interpreted with this in mind.

Practical implications

The lack of evidence of age or cohort effects on satisfaction calls into question the tendency to attribute dissatisfaction mainly to younger citizens. Policies aimed at fostering satisfaction with democracy may benefit from considering broader political and social contexts, rather than focusing exclusively on age groups.

In addition, positive association between party proximity and satisfaction with democracy suggests that strengthening the link between citizens and political parties may be worth exploring as a route to greater satisfaction, although its direction cannot be established here. Similarly, lower satisfaction in the North relative to Greater Lisbon may warrant attention to territorial inequalities and decentralisation policies, consistent with evidence on regional asymmetries in Portugal (Silva & Ribeiro, 2014).

The strength of the association between government evaluation and satisfaction with democracy, particularly in 2022, suggests that perceived government performance is worth considering in efforts to sustain and promote satisfaction with democracy. The persistence of the 2011 period effect nevertheless indicate that improving government evaluations may not be sufficient, as dissatisfaction in that year was not fully explained by them.

These implications should be interpreted cautiously. The study is observational, covers a single country, and relies on one of several possible measures of democratic attitudes, so the associations reported cannot, on their own, support definitive policy recommendations.

References

Aarts, K., & Thomassen, J. (2008). Satisfaction with democracy: Do institutions matter? *Electoral Studies*, *27*(1), 5–18. https://doi.org/10.1016/j.electstud.2007.11.005

Anderson, C. J., & Guillory, C. A. (1997). Political institutions and satisfaction with democracy: A cross-national analysis of consensus and majoritarian systems. *American Political Science Review*, *91*(1), 66–81. https://doi.org/10.2307/2952259

Arellano, A., Janmaat, J. G., & Hoskins, B. (2026). Education for democracy: A review of studies examining the effect of education on levels and distributions of democratic competences. *Educational Research Review*, *51*, 100792. https://doi.org/10.1016/j.edurev.2026.100792

Armingeon, K., & Guthmann, K. (2014). Democracy in crisis? The declining support for national democracy in European countries, 2007–2011. *European Journal of Political Research*, *53*(3), 423–442. https://doi.org/10.1111/1475-6765.12046

Bell, A., & Jones, K. (2018). The hierarchical age–period–cohort model: Why does it find the results that it finds? *Quality & Quantity*, *52*(2), 783–799. https://doi.org/10.1007/s11135-017-0488-5

Braungart, R. G., & Braungart, M. M. (1986). Life-course and generational politics. *Annual Review of Sociology, 12*, 205–231. https://doi.org/10.1146/annurev.so.12.080186.001225

Christmann, P. (2018). Economic performance, quality of democracy and satisfaction with democracy. *Electoral Studies*, *53*, 79–89. https://doi.org/10.1016/j.electstud.2018.04.004

Christmann, P., Magalhães, P. C., & Vasilopoulou, S. (2025). Divergent paths of political trust in Southern Europe: The roles of economic performance, corruption, congruence, and polarisation. *South European Society and Politics*, *30*(4), 621–649. https://doi.org/10.1080/13608746.2025.2576094

Christmann, P., & Torcal, M. (2017). The political and economic causes of satisfaction with democracy in Spain – a twofold panel study. *West European Politics*, *40*(6), 1241–1266. https://doi.org/10.1080/01402382.2017.1302178

Cordero, G., & Simón, P. (2016). Economic crisis and support for democracy in Europe. *West European Politics, 39*(2), 305–325. https://doi.org/10.1080/01402382.2015.1075767

Costa, P., Jalali, C., & Silva, P. (2026). Too young to party, ready to say enough? Youth turnout and the rise of Chega in Portugal. *South European Society and Politics*, *31*(2), 209–239. https://doi.org/10.1080/13608746.2025.2581969

Dimock, M. (2019, January 17). *Defining generations: Where Millennials end and Generation Z begins*. Pew Research Center. https://www.pewresearch.org/short-reads/2019/01/17/where-millennials-end-and-generation-z-begins/

Easton, D. (1965). *A systems analysis of political life*. Wiley.

Easton, D. (1975). A re-assessment of the concept of political support. *British Journal of Political Science, 5*(4), 435–457. https://doi.org/10.1017/S0007123400008309

Ferreira da Silva, F. (2026). Affective polarisation and voting behavior in Portugal (2002–2024): Consistent levels, growing electoral relevance. *South European Society and Politics*, *31*(2), 273–295. https://doi.org/10.1080/13608746.2025.2562297

Fienberg, S. E., & Mason, W. M. (1979). Identification and estimation of age-period-cohort models in the analysis of discrete archival data. *Sociological Methodology*, *10*, 1–67. https://doi.org/10.2307/270764

Foa, R. S., Klassen, A., Slade, M., Rand, A., & Collins, R. (2020). *The global satisfaction with democracy report 2020*. University of Cambridge. https://doi.org/10.17863/CAM.90179

Foa, R. S., Klassen, A., Wenger, D., Rand, A., & Slade, M. (2020). *Youth and satisfaction with democracy: Reversing the democratic disconnect?* Bennett Institute for Public Policy, University of Cambridge. https://doi.org/10.17863/CAM.90184

Foa, R. S., & Mounk, Y. (2016). The danger of deconsolidation: The democratic disconnect. *Journal of Democracy, 27*(3), 5–17. https://doi.org/10.1353/jod.2016.0049

Friedrichsen, J., & Zahn, P. (2014). Political support in hard times: Do people care about national welfare? *European Journal of Political Economy*, *35*, 23–37. https://doi.org/10.1016/j.ejpoleco.2014.03.007

Friehe, T., & Pfeifer, C. (2024). Predicting satisfaction with democracy in Germany using local economic conditions, social capital, and individual characteristics. *Economics of Governance*, *25*(3), 335–377. https://doi.org/10.1007/s10101-024-00315-x

Gorbunova, E., & Raimundo, F. (2013). Direitos e liberdades e qualidade da democracia em Portugal. In A. C. Pinto, P. C. Magalhães, & L. de Sousa (Eds.), *A qualidade da democracia em Portugal: A visão dos cidadãos* (pp. 153–178). Imprensa de Ciências Sociais. http://hdl.handle.net/10451/22833

Gorbunova, E., Sanches, E. R., & Lobo, M. C. (2015). A satisfação com a democracia e os fatores explicativos: Portugal no contexto europeu. In J. Ferrão & A. Delicado (Eds.), *Portugal social em mudança 2015: Portugal no contexto europeu em anos de crise* (pp. 9–17). Imprensa de Ciências Sociais. http://hdl.handle.net/10451/33278

Huntington, S. P. (1991). *The third wave: Democratization in the late twentieth century*. University of Oklahoma Press.

Inglehart, R. (1997). *Modernization and postmodernization: Cultural, economic, and political change in 43 societies*. Princeton University Press.

Inglehart, R. F. (2016). How much should we worry? *Journal of Democracy*, *27*(3), 18–23. https://doi.org/10.1353/jod.2016.0053

Just, A. (2018). Religious engagement and citizen support for democratic accountability in contemporary democracies. *Social Science Research*, *75*, 130–141. https://doi.org/10.1016/j.ssresearch.2018.06.002

Kenny, M., & Luca, D. (2021). The urban-rural polarisation of political disenchantment: An investigation of social and political attitudes in 30 European countries. *Cambridge Journal of Regions, Economy and Society*, *14*(3), 565–582. https://doi.org/10.1093/cjres/rsab012

Kostelka, F., & Blais, A. (2018). The chicken and egg question: Satisfaction with democracy and voter turnout. *PS: Political Science & Politics*, *51*(02), 370–376. https://doi.org/10.1017/S1049096517002050

Kriesi, H. (2020). Is There a Crisis of Democracy in Europe? *Politische Vierteljahresschrift*, *61*(2), 237–260. https://doi.org/10.1007/s11615-020-00231-9

Linde, J., & Ekman, J. (2003). Satisfaction with democracy: A note on a frequently used indicator in comparative politics. *European Journal of Political Research*, *42*(3), 391–408. https://doi.org/10.1111/1475-6765.00089

Lobo, M. C. (2024). The Portuguese party system: A realignment? In T. Poguntke & W. Hofmeister (Eds.), *Political parties and the crisis of democracy: Organization, resilience, and reform* (pp. 199–217). Oxford University Press. https://doi.org/10.1093/oso/9780198888734.003.0010

Lobo, M. C., Ferreira da Silva, F., Espírito-Santo, A., Magalhães, P., Jalali, C., Pereira, J. S., Heyne, L., Manucci, L., & Costa, P. (2025). *Estudo eleitoral português: 2025* [Data set]. Arquivo Português de Informação Social. http://hdl.handle.net/10400.20/2126

Lobo, M. C., Heyne, L., Magalhães, P. C., Barreto, A., Cabrita, L., Costa, P., Flores, I., Freire, A., Gaspar, J. T., Hanenberg, L., Jalali, C., Pereira, M. M., Ramos, A., Santana-Pereira, J., Espírito-Santo, A., Silva, P., Serra-Silva, S., & Vicente, P. (2024). *Estudo eleitoral português: Base de dados integrada 2002–2024* [Data set]. Arquivo Português de Informação Social. http://hdl.handle.net/10400.20/2123

Magalhães, P. C. (2005). Disaffected democrats: Political attitudes and political action in Portugal. *West European Politics*, *28*(5), 973–991. https://doi.org/10.1080/01402380500310626

Mason, W. M., & Fienberg, S. E. (Eds.). (1985). *Cohort analysis in social research: Beyond the identification problem*. Springer. https://doi.org/10.1007/978-1-4613-8536-3

Norris, P. (Ed.). (1999). *Critical citizens: Global support for democratic government*. Oxford University Press. https://doi.org/10.1093/0198295685.001.0001

Norris, P. (2001). *Making democracies work: Social capital and civic engagement in 47 societies* (Working Paper No. RWP01-036). John F. Kennedy School of Government, Harvard University. https://www.researchgate.net/publication/4892578_Making_Democracies_Work_Social_Capital_and_Civic_Engagement_in_47_Societies

Norris, P. (2017). *Is Western democracy backsliding? Diagnosing the risks* (HKS Working Paper No. RWP17-012). Harvard Kennedy School. https://doi.org/10.2139/ssrn.2933655

Putnam, R. D. (1993). What makes democracy work? *National Civic Review, 82*(2), 101–107. https://doi.org/10.1002/ncr.4100820204

Putnam, R. D. (2000). *Bowling alone: The collapse and revival of American community*. Simon & Schuster.

Quaranta, M., Cancela, J., Martín, I., & Tsirbas, Y. (2021). Trust, satisfaction and political engagement during economic crisis: Young citizens in Southern Europe. *South European Society and Politics*, *26*(2), 153–179. https://doi.org/10.1080/13608746.2021.1991568

Quaranta, M., & Martini, S. (2016). Does the economy really matter for satisfaction with democracy? Longitudinal and cross-country evidence from the European Union. *Electoral Studies*, *42*, 164–174. https://doi.org/10.1016/j.electstud.2016.02.015

Quaranta, M., & Martini, S. (2017). Easy come, easy go? Economic performance and satisfaction with democracy in Southern Europe in the last three decades. *Social Indicators Research, 131*(2), 659–680. https://doi.org/10.1007/s11205-016-1270-0

R Core Team. (2026). *R: A language and environment for statistical computing* [Computer software]. R Foundation for Statistical Computing. https://www.R-project.org/

Rodríguez-Pose, A. (2018). The revenge of the places that don't matter (and what to do about it). *Cambridge Journal of Regions, Economy and Society*, *11*(1), 189–209. https://doi.org/10.1093/cjres/rsx024

Ryder, N. B. (1965). The cohort as a concept in the study of social change. *American Sociological Review, 30*(6), 843-861. https://doi.org/10.2307/2090964

Sanches, E. R., & Gorbunova, E. (2016). Portuguese citizens' support for democracy: 40 years after the Carnation Revolution. *South European Society and Politics*, *21*(2), 211–226. https://doi.org/10.1080/13608746.2015.1130680

Silva, J. F., & Ribeiro, J. C. (2014). As assimetrias regionais em Portugal: Análise da convergência versus divergência ao nível dos municípios. *DRd – Desenvolvimento Regional em Debate, 4*(1), 84–109. https://doi.org/10.24302/drd.v4i1.440

Silva, N. R. (2026). *Too young or not yet integrated? Rethinking youth turnout across the life course in Portugal* [Master's dissertation, Faculdade de Psicologia e de Ciências da Educação, Universidade do Porto]. https://hdl.handle.net/10216/175143

Singh, S. P., & Mayne, Q. (2023). Satisfaction with democracy: A review of a major public opinion indicator. *Public Opinion Quarterly*, *87*(1), 187–218. https://doi.org/10.1093/poq/nfad003

Teixeira, C. P., Tsatsanis, E., & Belchior, A. M. (2014). Support for democracy in times of crisis: Diffuse and specific regime support in Portugal and Greece. *South European Society and Politics*, *19*(4), 501–518. https://doi.org/10.1080/13608746.2014.975770

Pequito Teixeira, C., de Almeida Pereira, P., & Belchior, A. M. (2019). Political discontentment in Portugal post-Troika: Risks and opportunities. In A. Costa Pinto & C. Pequito Teixeira (Eds.), *Political institutions and democracy in Portugal: Assessing the impact of the Eurocrisis* (pp. 215–246). Palgrave Macmillan. https://doi.org/10.1007/978-3-319-98152-9_11

Torcal, M. (2014). The decline of political trust in Spain and Portugal: Economic performance or political responsiveness? *American Behavioral Scientist*, *58*(12), 1542–1567. https://doi.org/10.1177/0002764214534662

Tsatsanis, E., Lisi, M., & Freire, A. (2021). The 'Lost Generation' and its political discontents: Age-related divides in Southern Europe after the crisis. *South European Society and Politics*, *26*(2), 133–151. https://doi.org/10.1080/13608746.2021.2032936

Voeten, E. (2016). Are people really turning away from democracy? *SSRN*. https://doi.org/10.2139/ssrn.2882878

Wong, K. T., Zheng, V., & Wan, P. (2017). A dissatisfied generation? An age–period–cohort analysis of the political satisfaction of youth in Hong Kong from 1997 to 2014. *Social Indicators Research*, *130*(1), 253–276. https://doi.org/10.1007/s11205-015-1175-3

Wroe, A. (2014). Political trust and job insecurity in 18 European polities. *Journal of Trust Research*, *4*(2), 90–112. https://doi.org/10.1080/21515581.2014.957291

Wuttke, A., Gavras, K., & Schoen, H. (2022). Have Europeans grown tired of democracy? New evidence from eighteen consolidated democracies, 1981–2018. *British Journal of Political Science*, *52*(1), 416–428. https://doi.org/10.1017/S0007123420000149

Yang, Y., & Land, K. C. (2008). Age–period–cohort analysis of repeated cross-section surveys: Fixed or random effects? *Sociological Methods & Research*, *36*(3), 297–326. https://doi.org/10.1177/0049124106292360

Yang, Y., & Land, K. C. (2013). *Age-period-cohort analysis: New models, methods, and empirical applications*. Chapman and Hall/CRC. https://doi.org/10.1201/b13902

Zilinsky, J. (2019). Democratic deconsolidation revisited: Young Europeans are not dissatisfied with democracy. *Research & Politics*, *6*(1), 2053168018814332. https://doi.org/10.1177/2053168018814332

Appendices

Appendix A

Government evaluation was predominantly negative, with 42.7% rating government performance as bad and 18.0% as very bad. The intermediate category had no valid responses in any election year and was therefore excluded, so this variable was analysed using only four levels and had the highest number of missing values of the model (1,308).

Electoral participation showed an asymmetrical distribution, with 75.5% of participants reported having voted, and 24.5% reported not having voted.

Also, party proximity showed a similar asymmetry: 58.7% of respondents reported no proximity to any party, being the most common category.

Table A1

Descriptive Statistics for Study Variables

Variable	Category / scale	*n* / descriptive statistic	Valid % / range	Missing
Satisfaction with democracy	Not at all satisfied	2,150	16.5	355
	Not very satisfied	4,673	36.0	
	Fairly satisfied	5,668	43.6	
	Very satisfied	501	3.9	
Age	Continuous variable, in years	$M = 50.10$, $SD = 17.86$	18–96	5
Election year	2002	1,303	9.8	0
	2005	2,700	20.2	
	2009	1,317	9.9	
	2011	1,000	7.5	
	2015	1,499	11.2	
	2019	1,500	11.2	
	2022	1,010	7.6	
	2024	1,001	7.5	
	2025	2,017	15.1	

Variable	Category / scale	*n* / descriptive statistic	Valid % / range	Missing
Generation	Pre-1945	2,464	18.5	5
	Baby Boomers	4,680	35.1	
	Generation X	3,463	26.0	
	Millennials	2,039	15.3	
	Generation Z	696	5.2	
Gender	Male	6,000	45.0	5
	Female	7,342	55.0	
Education	Low	5,303	39.9	55
	Medium	5,737	43.2	
	High	2,252	16.9	
Employment status	Employed	7,046	53.8	252
	Unemployed	1,129	8.6	
	Inactive	4,920	37.6	
Region	North	4,904	36.8	5
	Greater Lisbon	4,134	31.0	
	Other regions	4,304	32.3	
Electoral participation	Did not vote	3,224	24.5	171
	Voted	9,952	75.5	
Party proximity	No party proximity	7,367	58.7	788
	Left	3,112	24.8	
	Right	2,080	16.6	
Government evaluation	Very bad	2,170	18.0	1,308
	Bad	5,143	42.7	
	Good	4,451	37.0	
	Very good	275	2.3	
Religious attendance	Never	3,143	25.7	1,098
	Once a year	2,091	17.1	
	Two to eleven times a year	1,671	13.6	
	Once a month	1,465	12.0	
	Two or more times a month	1,282	10.5	
	Once a week or more	2,597	21.2	

Note. The total sample comprises 13,347 respondents. Percentages are valid percentages calculated within each variable. Missing values refer to respondents with no usable information on that variable. For age, the mean, standard deviation and observed range are reported. Government evaluation has four categories because the middle category of the original five-point

Variable	Category / scale	*n* / descriptive statistic	Valid % / range	Missing

scale had no valid observations in any wave. Religious attendance shows empty categories in four of the nine waves due to differences in question wording across surveys.

Analytical Samples and Missing Data

Complete-case analysis was conducted separately for each analytical model, leading to different levels of case retention (Appendix Table A2). The simple age models retained 97.3% of the original sample, whereas those including the additional predictors retained 75.0%. A comparison of excluded and retained participants in the full model showed relatively modest differences across several characteristics, although more pronounced differences emerged for party proximity and electoral participation (Appendix Table A3). Among excluded participants, 66.8% reported no party proximity, compared with 56.6% of retained participants, while 70.4% reported having voted, compared with 77.1% among those retained. Differences were also observed in other characteristics, including government evaluation, religious attendance, education, employment status, and generation, although their magnitude varied. Retention also varied across election years, from 68.3% in 2019 to 89.6% in 2024. Overall, the retained and excluded groups were not fully comparable on observed characteristics, suggesting that the data were not missing completely at random and that the analytical samples may differ systematically from the original sample.

Table A2

Analytical Sample for Each Model

Analytical stage	Initial *n*	*n* excluded	Analytical *n*	% retained
Simple age models, 2002–2025	13,347	355	12,992	97.3
Natural age group model, 2002–2025	13,347	3,334	10,013	75.0
Synthetic cohort model, 2002–2025	13,347	3,334	10,013	75.0
Full model, 2002–2025	13,347	3,334	10,013	75.0

Note. Complete-case analysis were conducted separately at each analytical stage. Exclusions refer to respondents with missing information on the dependent variable or on at least one predictor required by the corresponding model. The percentage retained was calculated relative to the total sample. Simple age models retained more cases because they requirekd information only on the dependent variable and age.

Table A3

Comparison of Retained and Excluded Cases (Full Model)

Variable	Excluded	Retained	Test statistic	*p*
Age, *M* (*SD*)	49.3 (18.6)	50.4 (17.6)	t = -2.97	.003
Satisfaction with democracy, *M* (*SD*)	2.30 (0.80)	2.36 (0.79)	t = -4.05	< .001
Government evaluation, *M* (*SD*)	2.49 (1.21)	2.66 (1.21)	t = -5.62	< .001
Religious attendance, *M* (*SD*)	3.45 (1.91)	3.24 (1.88)	t = 4.64	< .001
Female, %	54.6	55.2	χ^2 = 0.38	.535
Voted, %	70.4	77.1	χ^2 = 58.75	< .001
North region, %	35.8	37.1	χ^2 = 1.78	.183
Other regions, %	30.3	32.9	χ^2 = 7.36	.007
Education			χ^2 = 14.38	.001
Low	38.0	40.5		
Medium	43.0	43.2		
High	19.0	16.3		
Employment status			χ^2 = 10.28	.006
Employed	51.6	54.5		
Unemployed	9.7	8.3		
Inactive	38.7	37.2		
Generation			χ^2 = 34.22	< .001
Pre-1945	20.5	17.8		
Baby Boomers	32.1	36.1		
Generation X	25.3	26.2		
Millennials	15.7	15.1		
Generation Z	6.4	4.8		
Party proximity			χ^2 = 90.16	< .001
No party proximity	66.8	56.6		

Variable	Excluded	Retained	Test statistic	*p*
Left	20.6	25.8		
Right	12.5	17.6		

Note. Excluded n = 3,334; retained n = 10,013. Retained participants are those included in the full model reported in Table 3. Continuous variables were compared using independent-samples t-tests and categorical variables using chi-square tests; test statistics are reported alongside the corresponding variables. Category-specific percentages are shown for categorical variables. Given the large sample size, statistically significant differences should not necessarily be interpreted as substantively meaningful. Retention varied across election year (68.3 to 89.6%), indicating some variation in missingness across periods.

Appendix B

Table B1

Ordinal Models of Satisfaction with Democracy by Age

Model	Predictor	*B*	*SE*	*OR* [95% CI]	*p*
Age only	Age	-0.00178	0.00092	0.9982 [0.9964, 1.0000]	.052
Age + age squared	Age	-0.01794	0.00522	0.9822 [0.9722, 0.9923]	< .001
	Age squared	0.00016	0.00005	1.0002 [1.0001, 1.0003]	.002

Note. N = 12,992. Age only: log-likelihood = -14,976.56, AIC = 29,961.12. Age + age squared: log-likelihood = -14,971.60, AIC = 29,953.20. The dependent variable is satisfaction with democracy, measured on an ordered four-point scale ranging from 1 (*not at all satisfied*) to 4 (*very satisfied*). Cumulative link models with logit link; neither model includes control variables. Coefficients and standard errors are reported to five decimal places and odds ratios to four, because the age coefficients are small. Odds ratios above 1 indicate higher odds of falling into a more satisfied category. Threshold parameters are omitted. In the quadratic model, the positive age-squared coefficient indicates a U-shaped relationship, with a minimum at 55.7 years, calculated from the unrounded coefficients. AIC = Akaike information criterion; CI = confidence interval.

Natural age group model

The natural age group model allows us to determine whether being young is associated with greater or lesser satisfaction with democracy. To this end, participants were divided into two categories for each election: the young group comprises those aged between 18 and 29 at the time of the election; those aged 30 or over were placed in a separate group, enabling us to determine whether there are differences between the two groups over time. The model applied, therefore, compared the two groups while controlling for election year, gender, educational attainment, employment status, religious attendance, electoral participation, government evaluation, party proximity, and region.

Table B2

Natural Age Group Model of Satisfaction with Democracy

Predictor	*B*	*SE*	*OR* [95% CI]	*p*
Young, 18–29	0.038	0.152	1.04 [0.77, 1.40]	.805
Female	-0.050	0.040	0.95 [0.88, 1.03]	.206
Medium education	0.133	0.049	1.14 [1.04, 1.26]	.007
High education	0.445	0.064	1.56 [1.38, 1.77]	< .001
Unemployed	-0.221	0.072	0.80 [0.70, 0.92]	.002
Inactive	0.002	0.045	1.00 [0.92, 1.10]	.964

Predictor	*B*	*SE*	*OR* [95% CI]	*p*
Religious attendance	0.038	0.011	1.04 [1.02, 1.06]	< .001
Voted	0.244	0.047	1.28 [1.16, 1.40]	< .001
Government evaluation (linear)	1.579	0.106	4.85 [3.95, 5.97]	< .001
Government evaluation (quadratic)	0.210	0.079	1.23 [1.06, 1.44]	.008
Government evaluation (cubic)	-0.107	0.044	0.90 [0.82, 0.98]	.016
Party proximity: left	0.458	0.047	1.58 [1.44, 1.73]	< .001
Party proximity: right	0.281	0.054	1.32 [1.19, 1.47]	< .001
Region: North	-0.165	0.048	0.85 [0.77, 0.93]	< .001
Region: Other	-0.088	0.049	0.92 [0.83, 1.01]	.071

Note. N = 10,013. Log-likelihood = -10,887.13; AIC = 21,834.99. The dependent variable is satisfaction with democracy, measured on an ordered four-point scale ranging from 1 (*not at all satisfied*) to 4 (*very satisfied*). Cumulative link model with logit link. Odds ratios above 1 indicate higher odds of falling into a more satisfied category. Threshold parameters are omitted. CI = confidence interval. The model includes fixed effects for election years and interactions between age group and election year; interaction terms are reported in Appendix Table B3. The reference year is 2002 and the remaining coefficients represent average effects across the period. Reference categories: aged 30 or over, male, low educational attainment, employed, did not vote, no party proximity, Greater Lisbon. Government evaluation was entered as an ordered categorical predictor using linear, quadratic, and cubic polynomial contrasts.

The natural age group model showed no significant age difference in 2002, the reference category for election year (Table 5): B = 0.038, SE = 0.152, OR = 1.04, 95% CI [0.77, 1.40], p = .805. This finding extends to the remaining eight elections, as shown by the non-significant interaction terms between age group and election year (p-values ranging from .302 to .992) (Appendix Table B1). No significant age differences in satisfaction with democracy were found in any year, though the confidence interval does not rule out moderate differences in magnitude.

Coefficients for the control variables were broadly consistent with the full model (Table 7): education, electoral participation, government evaluation, and party proximity were significant positive predictors, while unemployment and the North region were significant negative predictors. However, gender, economic inactivity, and other regions were not significant.

Table B3

Interaction Terms Between Natural Age Group and Election Year

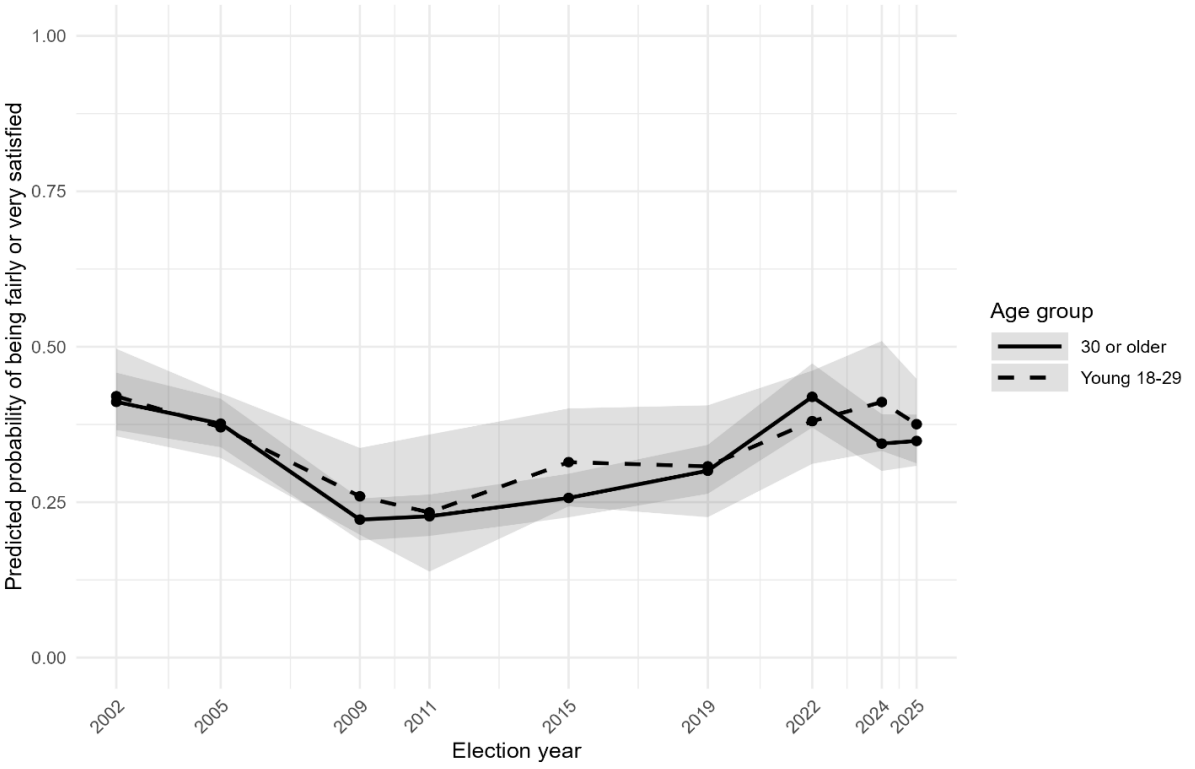
Election year	*B*	*SE*	*OR* [95% CI]	*p*
2005	-0.063	0.182	0.94 [0.66, 1.34]	.731
2009	0.168	0.232	1.18 [0.75, 1.87]	.470
2011	-0.003	0.311	1.00 [0.54, 1.83]	.992
2015	0.246	0.243	1.28 [0.79, 2.06]	.311
2019	-0.004	0.255	1.00 [0.60, 1.64]	.987
2022	-0.201	0.238	0.82 [0.51, 1.31]	.400
2024	0.247	0.240	1.28 [0.80, 2.05]	.302
2025	0.079	0.204	1.08 [0.73, 1.62]	.698

Note. N = 10,013. The reference year is 2002 and the reference group consists of respondents aged 30 or over in each election. Coefficients represent the change, relative to 2002, in the difference between young respondents (18–29) and older respondents. The model includes all control variables, including region and government evaluation (entered as an ordered categorical predictor). CI = confidence interval.

Appendix Figure B1 shows the predicted probabilities of being fairly or very satisfied with democracy, along with their confidence intervals, by age group from 2002 to 2025. The lines for the two age groups follow a similar pattern, moving in tandem over the years and crossing several times, with neither consistently remaining above the other, reinforcing the absence of an age divide already discussed. The probability of participants falling into these higher categories remained below 50% throughout, falling to as low as around 22% for the 30-and-over age group in 2009. A marked decline is also visible in 2009 and 2011, followed by an upward trend until 2022.

Figure B1

Predicted Probability of Being Fairly or Very Satisfied With Democracy, by Age Group



Note. Predicted probabilities from the natural age group ordinal model (Appendix Table B2), obtained by summing the two upper satisfaction categories (*fairly satisfied* and *very satisfied*). The solid line represents participants aged 30 or older; the dashed line represents the younger group (18–29). Categorical control variables were held at their reference categories, except government evaluation, held at its modal category (*bad*); continuous variables were held at their sample means. Shaded areas represent 95% percentile confidence bands from a case-resampled bootstrap with 500 resamples. Interaction terms are reported in Appendix Table B3.

Appendix C

Table C1

Interaction Terms Between Synthetic Cohort and Election Year

Election year	*B*	*SE*	*OR* [95% CI]	*p*
2005	-0.114	0.181	0.89 [0.63, 1.27]	.529
2009	0.194	0.218	1.21 [0.79, 1.86]	.375
2011	-0.413	0.255	0.66 [0.40, 1.09]	.105
2015	-0.105	0.220	0.90 [0.58, 1.38]	.632
2019	-0.078	0.215	0.93 [0.61, 1.41]	.719
2022	-0.036	0.223	0.96 [0.62, 1.49]	.871
2024	-0.011	0.216	0.99 [0.65, 1.51]	.958
2025	0.001	0.193	1.00 [0.69, 1.46]	.997

Note. N = 10,013. The reference year is 2002, and the reference group consists of respondents aged 30 or older in 2002. Coefficients represent the change, relative to 2002, in the difference between the cohort aged 18–29 in 2002 and the cohort aged 30 or older in 2002. The model includes all control variables, including region and government evaluation, which was entered as an ordered categorical predictor. CI = confidence interval.

Appendix D

Table D1

Number of Respondents by Generation and Election Year

Election year	Pre-1945	Baby Boomers	Generation X	Millennials	Generation Z
2002	389	455	367	92	—
2005	629	953	772	346	—
2009	370	457	325	160	—
2011	306	360	233	101	—
2015	303	605	340	220	31
2019	260	521	381	261	77
2022	71	333	284	201	121
2024	52	336	253	220	140
2025	84	660	508	438	327

Note. Counts refer to respondents with valid information on satisfaction with democracy, generation, and election year. Dashes indicate generation-by-election combinations with no respondents, as Generation Z was not of voting age before 2015. Group sizes vary across generations and election years, with particularly small counts for Generation Z in the earliest observed elections and for the Pre-1945 group in the most recent elections.

Appendix E

Table E1

Assumption Checks for the Ordinal Model

Assumption	How it was assessed	Outcome
Proportional odds	Likelihood ratio tests comparing the proportional odds model with models allowing predictor-specific threshold effects, conducted predictor by predictor	Violated for 5 of the 13 predictors tested; a partial proportional odds model was estimated as a robustness check (see note).
Ordinality of the dependent variable	Inspection of the estimated thresholds	Thresholds increase monotonically, as required
Independence of observations	Comparison of classical and cluster-robust standard errors, clustered by survey year	Nine clusters only; median *SE* ratio = 0.86; reported as a limitation
Absence of severe multicollinearity	Generalised variance inflation factors	Elevated only for the two age terms, as expected in a model including a quadratic term
Link function specification	Comparison of logit, probit, complementary log-log and Cauchy links by AIC	Best fit: logit; AIC difference from logit = 0

Note. All checks were carried out on the full model using the analytical sample. Multicollinearity and clustering were assessed on the equivalent linear specification because both concern the design matrix rather than the link function. Detailed results are reported in the appendix. Collinearity between centred age and its square is inherent to the quadratic specification and does not indicate misspecification. The proportional odds violation identified for five predictors (Appendix Table E2) was addressed with a partial proportional odds model, which confirmed the substantive conclusions of the main model (Appendix Table E3).

Table E2

Tests of the Proportional Odds Assumption

Predictor	*LR*	*df*	*p*
Age (centred)	2.57	2	.276
Age squared (centred)	4.75	2	.093
Election year	—	—	—
Generation	20.70	8	.008

Predictor	*LR*	*df*	*p*
Gender	3.32	2	.191
Education	7.36	4	.118
Employment status	2.29	4	.683
Religious attendance	4.54	2	.103
Electoral participation	1.91	2	.384
Government evaluation	80.40	6	< .001
Region: North	17.30	2	< .001
Region: Other	9.70	2	.008
Party proximity	11.80	4	.019

Note. Each row reports a likelihood ratio test comparing the proportional odds model with a model allowing the corresponding predictor to vary across thresholds. Significant values indicate violation of the proportional odds assumption. Dashes indicate tests that did not converge. Government evaluation was tested as a single term comprising its three polynomial contrasts (linear, quadratic, and cubic), hence the larger degrees of freedom. Given the sample size, small deviations from proportionality may reach statistical significance; substantive consequences were assessed using a partial proportional odds model.

Table E3

Partial Proportional Odds Model: Threshold-Specific Coefficients

Predictor	1|2	2|3	3|4
Baby Boomers	-0.157	-0.138	-0.025
Generation X	-0.263	-0.283	-0.168
Millennials	-0.376	-0.308	0.078
Generation Z	-0.724*	-0.273	-0.508
Government evaluation (linear)	-1.070***	-1.204***	-1.716***
Government evaluation (quadratic)	0.364**	-0.024	-0.929***
Government evaluation (cubic)	0.284***	0.262***	0.085
Party proximity: left	-0.366***	-0.464***	-0.638***
Party proximity: right	-0.230**	-0.292***	-0.465**
Region: North	-0.047	0.245***	0.292*
Region: Other	-0.028	0.099	0.463**

Note. Counts refer to respondents with valid information on satisfaction with democracy, generation, and election year. Dashes indicate generation-by-election combinations with no respondents, as Generation Z was not of voting age before 2015. Group sizes vary across generations and election years, with particularly small counts for Generation Z in the earliest observed elections and for the Pre-1945 group in the most recent elections.

*$p < .05$. **$p < .01$. ***$p < .001$.

Appendix F

HAPC model

As a further check, an HAPC model was estimated, with period and birth cohort as crossed random effects and age retained as a fixed effect, as in the previous models. The ordinal specification failed to converge, even with simpler versions and alternative cohort definitions, likely reflecting the difficulty of estimating crossed random effects with few periods. The linear specification converged instead; although not directly comparable to the ordinal models in scale, it pointed in the same direction, with no evidence of a significant cohort effect and a stronger period effect. As shown in Appendix Tables F1 and F2, the variance explained by birth cohort (ICC = .0006) was lower than that explained by electoral period (ICC = .0306), corroborating this pattern.

The HAPC model, however, does not fully resolve the identification problem among the three APC components, as it relies on the assumption that the random effects follow a normal distribution with mean zero.

Table F1

Linear Hierarchical Age-Period-Cohort Model of Satisfaction with Democracy

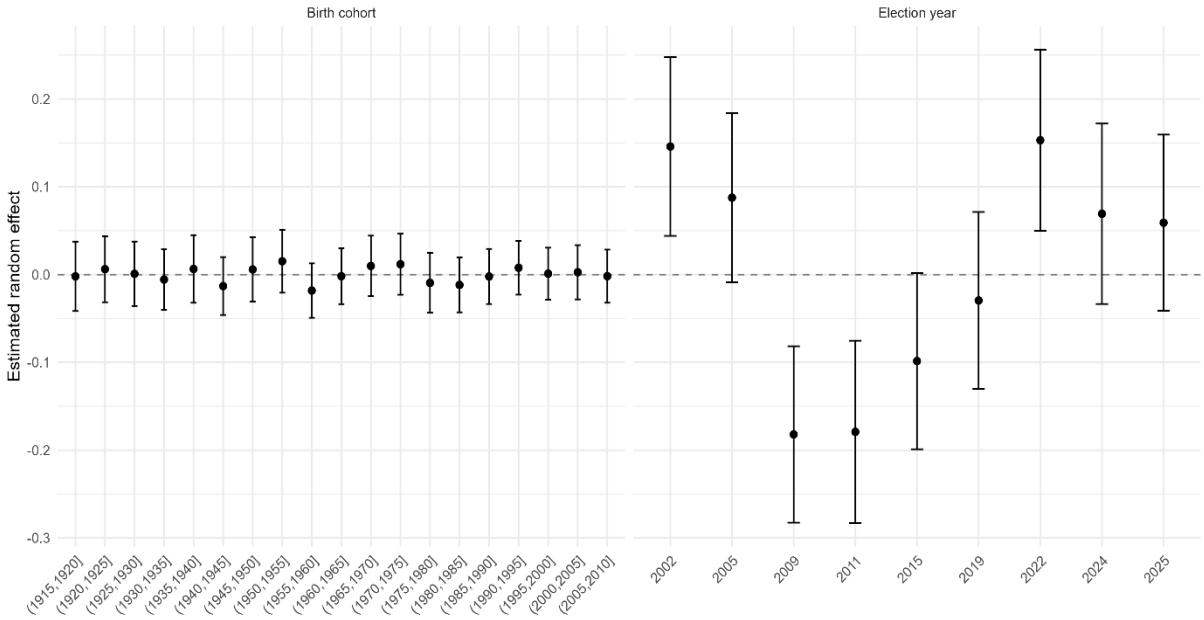
Predictor	*B*	*SE*	CI	*p*
Age (centred)	-0.001	0.001	[-0.002, 0.001]	.240
Age squared (centred)	0.000	0.000	[0.000, 0.000]	.041
Female	-0.021	0.016	[-0.051, 0.010]	.187
Medium education	0.046	0.020	[0.006, 0.086]	.024
High education	0.164	0.026	[0.114, 0.215]	< .001
Unemployed	-0.086	0.028	[-0.142, -0.031]	.002
Inactive	-0.003	0.022	[-0.047, 0.041]	.909
Religious attendance	0.016	0.004	[0.007, 0.025]	< .001
Voted	0.106	0.019	[0.069, 0.143]	< .001
Government evaluation (linear)	0.560	0.036	[0.489, 0.632]	< .001
Government evaluation (quadratic)	0.040	0.028	[-0.014, 0.094]	.146
Government evaluation (cubic)	-0.060	0.016	[-0.092, -0.028]	< .001
Party proximity: left	0.179	0.018	[0.144, 0.215]	< .001
Party proximity: right	0.110	0.021	[0.068, 0.151]	< .001

Predictor	*B*	*SE*	CI	*p*
Region: North	-0.060	0.019	[-0.097, -0.023]	.002
Region: Other	-0.033	0.019	[-0.070, 0.005]	.086

Note. N = 10,013. Linear mixed model with crossed random intercepts for election year (9 groups) and five-year birth cohort (19 groups). Variance components were 0.0176 for period (ICC = 0.0306), 0.0004 for cohort (ICC = 0.0006), and 0.5571 for the residual. *p*-values for fixed effects were computed using Satterthwaite's approximation. An equivalent ordinal specification (cumulative link mixed model) failed to converge; see the Method section. Government evaluation was entered as an ordered categorical predictor using linear, quadratic, and cubic polynomial contrasts. CI = confidence interval.

Figure F2

Estimated Random Effects for Election Year and Birth Cohort in the Linear Hierarchical Model



Note. Points represent estimated random effects (conditional modes) with 95% confidence intervals, obtained from 1,000 simulations using merTools::REsim(). Both panels share the same vertical scale to allow direct comparison of the magnitude of variation across birth cohorts and election years. Birth cohort intervals follow standard mathematical notation: parentheses indicate an excluded boundary and square brackets an included boundary; for example, '(1940,1945]' denotes respondents born between 1941 and 1945.

Appendix G

Table G1

Comparison of the Ordinal and Binary Logistic Specifications of the Full Model

Predictor	Ordinal		Binary	
	B	*p*	*B*	*p*
Age (centred)	0.004	.307	0.006	.192
Age squared (centred)	0.000	.072	0.000	.126
2005	-0.178	.024	-0.166	.050
2009	-0.899	< .001	-0.772	< .001
2011	-0.899	< .001	-1.071	< .001
2015	-0.737	< .001	-0.867	< .001
2019	-0.566	< .001	-0.659	< .001
2022	-0.093	.451	-0.226	.094
2024	-0.357	.005	-0.480	< .001
2025	-0.364	.003	-0.420	.002
Baby Boomers	0.140	.128	0.169	.097
Generation X	0.273	.064	0.320	.050
Millennials	0.295	.138	0.377	.088
Generation Z	0.375	.154	0.377	.197
Female	-0.052	.187	-0.062	.156
Medium education	0.118	.024	0.150	.009
High education	0.425	< .001	0.451	< .001
Unemployed	-0.213	.003	-0.212	.009
Inactive	-0.007	.899	-0.007	.912
Religious attendance	0.039	< .001	0.032	.011
Voted	0.258	< .001	0.238	< .001
Government evaluation (linear)	1.571	< .001	1.230	< .001

Predictor	Ordinal		Binary	
	B	*p*	*B*	*p*
Government evaluation (quadratic)	0.212	.007	0.035	.671
Government evaluation (cubic)	-0.109	.014	-0.262	< .001
Party proximity: left	0.462	< .001	0.471	< .001
Party proximity: right	0.283	< .001	0.297	< .001
Region: North	-0.170	< .001	-0.239	< .001
Region: Other	-0.089	.067	-0.094	.080

Note. N = 10,013. The ordinal model is the primary specification reported in Table 3 (AIC = 21,826.89). The binary model recoded satisfaction with democracy into two categories (0 = *not satisfied*, combining *not at all satisfied* and *not very satisfied*; 1 = *satisfied*, combining *fairly satisfied* and *very satisfied*) and was estimated using binary logistic regression (AIC = 12,884.86). The two AIC values are not directly comparable because they refer to different dependent variables. All 28 coefficients had the same sign across specifications, and 26 of 28 yielded the same statistical conclusion at the .05 level. The two exceptions were Generation X (borderline in both specifications) and the quadratic contrast of government evaluation, which became non-significant after the outcome was dichotomised.

Table G2

Variance Components: Linear and Binary HAPC Specifications (Five-Year Cohorts)

Specification	Level	Variance	ICC
Linear HAPC	Period	0.0176	.0306
	Cohort (5-year)	0.0004	.0006
	Residual	0.5571	.9687
Binary HAPC	Period	0.1019	.0300
	Cohort (5-year)	0.0031	.0009
	Residual	3.2899	.9691

Note. N = 10,013. ICC = intraclass correlation coefficient. For the binary model, ICCs were computed on the latent-variable scale, with the level-1 residual variance fixed at $\pi^2/3 \approx 3.29$. In both specifications, period variance substantially exceeded cohort variance (ratio ≈ 48:1 in the linear and ≈ 33:1 in the binary model), corroborating the absence of a meaningful cohort effect and the predominance of period effects.

Appendix H

Table H1

Performance Metrics for the Full Ordinal Model

Metric	Value
N	10,013
Log-likelihood	-10,882.45
AIC	21,826.89
McFadden's R^2	.06
Nagelkerke's R^2	.13
Classification accuracy	.49
Baseline accuracy (modal category)	.44
Kendall's tau	.27

Note. McFadden's and Nagelkerke's R^2 are pseudo-R^2 measures calculated relative to an intercept-only model. Classification accuracy is the proportion of respondents for whom the predicted category matches the observed category; baseline accuracy corresponds to always predicting the most frequently observed category. Kendall's tau measures the ordinal association between the model's linear predictor and the observed outcome and ranges from −1 to 1, with 0 indicating no association.

FACULDADE DE **PSICOLOGIA E DE CIÊNCIAS DA EDUCAÇÃO**