

RESEARCH ARTICLE

Roots of tolerance among second-generation immigrants

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Abstract

Tolerance – respecting individual choice and differences among people – is a prominent feature of modern European culture. That immigrants embrace this kind of liberal value is arguably important for integration, a central policy goal. We provide a rigorous study of what factors in the ancestral countries of second-generation immigrants – including formal and informal institutions – predict their level of tolerance towards gay people. Using the epidemiological method allows us to rule out reverse causality. Out of the 46 factors examined, one emerges as very robust: a Muslim ancestral background. Tolerance towards gay people is lower the larger the share of Muslims in the country from which the parents emigrated. An instrumental-variable analysis shows that the main mechanism is not through the individual being a Muslim, but through the individual being highly religious. Two additional attitudes among people in the ancestral country (valuing children being tolerant and respectful, and valuing children taking responsibility), as well as impartial institutions in the ancestral country, predict higher individual tolerance. Our findings thus point to an important role for both formal- and informal-institutional background factors in shaping tolerance.

Keywords: Tolerance; integration; liberal; culture; institutions; religion

In this world, which is getting more and more closely interconnected, we have to learn to tolerate each other.

Bertrand Russell, interviewed on BBC's *Face to Face*, 1959

1. Introduction

Immigration to and within Europe is nothing new, but the public debate has intensified in recent years as immigration flows have increased (UNHCR, 2019). Much of the public debate – such as that between Chancellor Angela Merkel and her challenger Martin Schulz in the 2017 German election campaign (El-Menouar, 2017) – concerns a lack of integration, which is thought to bring with it a number of social, economic and political challenges. Some of these challenges are connected to formal institutions – e.g. high minimum-wage laws and strict employment protection regulation (Kahn, 2007; Skedinger, 2010) and excluding immigrants from voting (Slotwinski *et al.*, 2017) or citizenship (Weldon, 2006) – while others are related to informal institutions or culture more broadly (Blau *et al.*, 2011; Koopmans, 2016; Lundborg, 2013). For example, Bisin *et al.* (2011: 57) write that “when they have a strong identity, second-generation immigrants have a lower chance of finding a job than natives.” Hence, one central aspect of integration is a closer alignment of the norms and

values of immigrants to those of the native population. If this can be achieved, it seems plausible to expect social harmony to be higher and the potential for integration to be greater.¹

Facilitating integration is not the only reason to strive for tolerance. Locke (1689) and Mill (1859) argued for its ability to generate peace, harmony and individual freedom; and modern research indicates that tolerance brings both subjective well-being, by allowing people, especially minorities such as gay people, to lead the lives they want without social and legal disapprobation (Corneo and Jeanne, 2009; Inglehart *et al.*, 2014), and economic development, by entailing low entry barriers for innovative people.²

Against this background, we ask what explains how tolerant second-generation immigrants in Europe are. Our main analysis focuses on tolerance towards gay people, an important indicator of liberal values typical of most European countries.³ We provide the most comprehensive empirical investigation to date of the predictors of this kind of tolerance, examining several classes of possible explanatory variables – most notably, the following features of the countries from which the parents of the second-generation immigrants migrated: political institutions, economic institutions, legal institutions, fractionalization, economic factors, and informal institutions (religion and culture). The idea is that these characteristics of the ancestral countries shape the values and norms of the parents, who grew up in those countries and transmit them to their children. Hence, we relate the tolerance of children of immigrants in 31 European countries, all of them born and residing there, to features of the 150 countries from which their parents stem.⁴ One advantage of this method is that it allows us to rule out reverse causality, since the individual-level tolerance of children growing up in a new country cannot influence basic features of the parents' home countries.

Our findings suggest that tolerance towards gay people among second-generation immigrants in Europe is related to one variable in a very robust way: the share of Muslims in the parents' home country. The higher the share, the lower the tolerance among today's second-generation immigrants. An instrumental-variable analysis suggests that the causal mechanism is the individual degree of religiosity rather than the individual being a Muslim. In addition, we find that three other features of the ancestral countries are positively related to our tolerance measure in most model specifications – two values considered important for children to learn (tolerance and respect, and a feeling of responsibility), and impartiality, a measure of institutional quality. Finally, we look at another dependent variable, attitudes towards the role of women, and find that the share wanting children to learn tolerance and respect and the Muslim share are significant predictors (positively and negatively) here as well, supporting an interpretation that these background factors are indicative of a liberal or an illiberal value orientation.

2. Theoretical framework, previous literature and our contribution

Theoretical framework

We are interested in what determines the values of the second-generation immigrants. Tolerance can be conceived as an informal institution in the sense of North (1990), i.e. as a non-codified rule or norm that puts restrictions on attitudes towards and treatment of others, and as an internal institution in the sense of Voigt (2013) to the extent that manifestations of intolerance are sanctioned by

¹Bansak *et al.* (2016) show that Europeans are more positive to asylum seekers if they are more employable, have more coherent reasons for asking for asylum, have more severe vulnerabilities and if they are Christian rather than Muslim. We consider it reasonable that people will also be more positive towards immigrants if the immigrants are tolerant.

²See Mokyr (1990: 12), McGranahan and Wojan (2007), Florida *et al.* (2008) and Berggren and Elinder (2012).

³Indeed, Akaliyski (2019) shows that substantial cultural convergence has occurred in the European Union, to the effect that a large share of Europeans in most countries today “embrace emancipative and secular values,” like tolerance. Against this background, our study provides a better understanding of the reasons for the remaining variation in tolerance across countries and groups of people; and the Akaliyski findings reinforce the view that tolerance among immigrants is an important value for fitting into their European countries of residence today.

⁴This method of regressing individual outcomes on ancestral-country factors has become established in social science research; e.g. Fernández and Fogli (2009), Algan and Cahuc (2010) and Luttmer and Singhal (2011).

members of society through social (rather than legal) mechanisms. It is in this sense akin to the role of the generality principle of Buchanan and Congleton (1998) in the context of formal institutions, which puts restrictions on what kind of political decisions are permissible.

Our theoretical framework links characteristics of the ancestral country, in which the first-generation immigrants were born and raised, to characteristics of their children. As Figure 1 shows, the values a second-generation immigrant holds are affected by individual characteristics, country-of-birth characteristics and parental values. The parental values, in turn, are influenced by the ancestral country characteristics, which are grouped into six categories, as explained and motivated in online appendix 1.⁵ This schematic understanding of the formation of values builds on Bisin and Verdier (2000, 2001, 2011), who model two transmission channels for values: horizontal transmission (from the surrounding society) and vertical transmission (from the parents).⁶ In our empirical analysis, we do not use parental values directly but rather the characteristics of the ancestral country, as indicated by the dashed line, for two reasons: there are no data on parental values and if one were to use them, it would introduce a risk for reverse causality.

Our theoretical approach does not point out a particular (set of) explanatory variables as important *a priori*, but allows for a wide range of factors (guided by a wider set of theories) to potentially affect tolerance.

Previous literature and our contribution

Research on what explains tolerance is limited, especially from a cross-country perspective. Corneo and Jeanne (2009) examine whether people consider homosexuality justifiable and find that they are more likely to do so if GDP per capita is higher and if the country of residence has become an EU member; likewise, looking at individual variables, being female, having a higher income, being unmarried and being a student or a part-time worker are all related to more tolerance. Andersen and Fetner (2008) provide evidence that tolerance is negatively related to income inequality but also that people become more tolerant with higher incomes. In a series of studies, Berggren and Nilsson (2013, 2014, 2015, 2016) look at tolerance as a function of economic-legal institutions, as measured by economic freedom indices and the KOF index of globalization. Among other things, they show that a high-quality legal system and monetary stability are positively associated with tolerance both towards people of a different race and towards gays and lesbians; that social trust enhances this effect of institutions; that more general taxation across US states is conducive to tolerance towards atheists, communists, and gay people; and that social and economic globalization seems to induce parents to want to teach their children tolerance.

Doebler (2015) focuses on various aspects of religion across Europe and generally finds that individual-level indicators (e.g. being a member of a religious denomination and attending religious services) predict a moral rejection of homosexuality and intolerance against gays and lesbians. Belief in a personal God is related to the former but not very much to the latter measure of “homonegativity.” In addition, looking at country-level measures, religiosity, corruption, income inequality and non-equal rights are found to make moral rejection and intolerance more likely. Jäckle and Wenzelburger (2015) similarly use multilevel analysis for the relationship between religion and attitudes towards homosexuality across 79 countries and find differences in how negative people are towards gays and lesbians depending on which religion they belong to. Fielding (2018) documents a historic influence from migration patterns in the Middle Ages in the UK on attitudes towards immigrants today. Towns that historically welcomed Jews have more tolerant inhabitants today, indicating intergenerational transmission of attitudes and persistence over time, as well as one type of tolerance (towards Jews) encompassing another (towards all kinds of modern-day immigrants). Aldashev *et al.* (2012) show that legal reforms can influence social norms, not least in the area of family life,

⁵In line with Krosnick and Alwin (1989) and Bergh and Öhrvall (2018), individuals’ attitudes are assumed to be formed primarily during late adolescence and early adulthood and then to remain relatively unchanged. The supplementary material is available at <https://www.dropbox.com/s/qayefb4hrfn01w2/Supplementary%20material.docx?dl=0> (accessed 6 June 2019).

⁶Fernández (2011) and Soehl (2017) document that parents transmit values to their children.

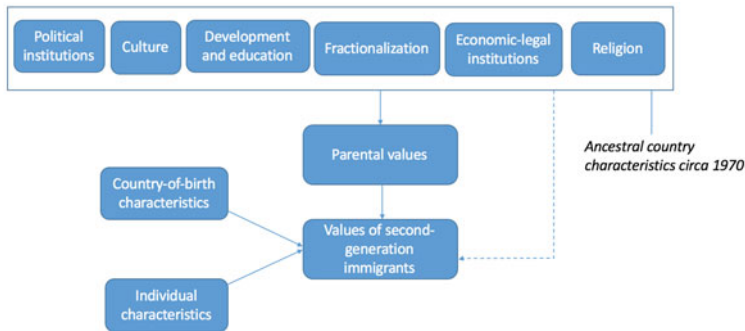


Figure 1. The determinants of tolerance

suggesting that cultural variables can be shaped by formal institutions. Lastly, Fernández *et al.* (2019) find evidence that political rhetoric, policy decisions and the prevalence of AIDS encouraged more favorable attitudes towards gay people in the United States. It demonstrates the malleability of values and attitudes like tolerance.

Compared to the existing studies of tolerance we add valuable insights in at least four ways:

- (1) We rule out reverse causality and provide causal evidence for what shapes tolerance. As noted in our theoretical discussion (in online appendix 1), several variables that we (and previous studies) examine can both determine and be determined by tolerance, stressing the need to rule out reverse causality when testing the relationship empirically.
- (2) We examine the richest set of potential explanatory variables in the literature so far, with a particular focus on formal and informal institutions.
- (3) We use three model-specification approaches to examine the question (one thematic approach and two mechanical variable selection methods), along with a number of robustness checks and extensions, as well as an instrumental-variable analysis to gain further understanding of relevant mechanisms.
- (4) We focus on immigrants and the link to integration, arguably providing a further benefit of immigrants being tolerant.

3. Data and empirical method

Data

Our main outcome variable is *tolerance*, measured with a question from the second to sixth rounds of the European Social Survey (ESS), spanning the period 2004–2012, asking to what degree respondents agree with the statement that “gay men and lesbians should be free to live their own life as they wish.” Possible answers range from “Disagree strongly,” coded as 1, to “Agree strongly,” coded as 5, with intermediate categories “Disagree” (2), “Neither agree nor disagree” (3) and “Agree” (4). There are indications that this measure is a useful indicator of tolerance more generally, but we do not want to overemphasize generalizability.⁷ Even so, we consider it worthwhile to identify factors that

⁷There is support for a link between different kinds of tolerance, as stressed by Inglehart and Abramson (1999). In that vein, Ekehammar and Akrami (2003) and Akrami *et al.* (2011) show how different types of prejudices (sexism, racism, homophobia, and prejudice against the disabled) are positively correlated – they identify “generalized prejudice” encompassing different types of prejudice in many people. This is reinforced by a factor analysis yielding a generalized prejudice factor explaining 50 to 60% of the variance. Our own correlation analysis using the General Social Survey from the United

shape tolerance towards gay people, as we consider that an important outcome variable in its own right.⁸

In a complementary analysis, we replace the tolerance measure by another indicator of liberal values, the degree to which one agrees, on a five-point scale, with the statement “Women should be prepared to cut down on paid work for sake of family,” with a higher number indicating stronger disagreement (and a stronger liberal value orientation).

The ESS has representative samples for each country and round, and it features information about the country of birth of each respondent as well as of both parents. This enables us to look at second-generation immigrants and to identify which country the parents migrated from. The data span 31 European countries in which the second-generation immigrants were born and reside, which makes it likely that our findings are not the result of the particular conditions of some idiosyncratic country. The following countries of birth and residence for our second-generation immigrants are included: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Israel, Italy, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Russian Federation, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine and United Kingdom. We are able to observe the tolerance of individuals whose parents come from about 150 countries from all over the world.⁹ The fact that the second-generation immigrants stem from different background countries facilitates generalizations on the basis of our findings.¹⁰

As for explanatory factors, we sort 46 characteristics of the ancestral countries thematically into six groups: political institutions, culture, development and education, fractionalization, economic-legal institutions, and religion. In addition, we include exogenous individual-level controls for age and gender throughout the analysis and, in a sensitivity analysis, further individual control variables: education, income, marital status, employment status, subjective health, and happiness. All these explanatory variables are defined and motivated, theoretically and empirically, in online appendix 1, where we also present regression tables and data sources. The summary statistics are in Table A11 in online appendix 2.

Empirical method

We apply the epidemiological method (Fernández, 2011) to infer how ancestral country characteristics influence tolerance among second-generation immigrants, using ordinary least squares (OLS) to estimate regressions of this kind:

$$\text{Tolerance}_{icat} = \beta_1 X_a + \beta_2 Z_{icat} + \gamma_{ct} + \varepsilon_{icat} \quad (1)$$

Tolerance_{icat} is the measure of the tolerance level of second-generation immigrant i , born and residing in country c with a parent born in country a , where $a \neq c$, in period t . The vector X_a contains the 46 characteristics of country that may affect the tolerance of individuals whose parents stem from it. Z_{icat} captures individual controls, γ_{ct} is the country-of-residence-by-year fixed effects, while ε_{icat} is the error term.¹¹ Standard errors are clustered by the parent’s birth country to allow for arbitrary

States shows that tolerance towards gay people, measured by a willingness to let gay people speak in public, is positively related to tolerance also for atheists, communists and militarists – see Table A9 in online appendix 2.

⁸We furthermore note that the intolerance of immigrants is sometimes used as an argument by anti-immigrant politicians – claiming, like the assassinated Dutch politician Pim Fortuyn or Geert Wilders in today’s Netherlands, that they threaten to undermine the liberal progress for gay people and women in the West. A related debate is taking place among some feminists, concerned about illiberal attitudes towards women among certain immigrant groups (Okin, 1997).

⁹More information about the ESS data can be accessed at <http://ess.nsd.uib.no/>. Table A10 in Online Appendix 2 presents all countries of origin of the parents of the second-generation immigrants.

¹⁰While we compare second-generation immigrants born in the same country but from different ancestral countries with each other, this group as a whole has similar observable characteristics to those of people in general in their countries of birth, e.g. in terms of health, income, and marital status (see Ljunge, 2014a, 2014b, 2016).

¹¹The fixed effects mean that we account for culture, institutions and all other unobserved differences which apply to all residents in country c in period t . Moreover, since the country fixed effects are included for each year, they account for non-linear trends that may differ across countries.

correlations of the error terms among second-generation immigrants from the same ancestral country.¹² Importantly, we can rule out reverse causality by using this method, since the tolerance of an individual born and residing in country *c* cannot affect country-level features in the parents' birth country *a*, for spatial and temporal reasons.

The analysis is undertaken in two main ways: through systematic tests of the 46 variables grouped thematically and through mechanical tests. The first part consists of three steps: (1) each ancestral variable is regressed on tolerance one at a time; (2) then the variables are combined by category into cumulative models; (3) the variables that are statistically significant at the 5% level or lower in the preceding analysis are put in a regression together. The second part examines the roots of tolerance using mechanical variable selection techniques, in the form of Extreme Bounds Analysis (EBA) and LASSO (Least Absolute Shrinkage and Selection Operator) (a machine learning method), which results in regressions with the most important variables for explaining our measure of tolerance. For both parts of the analysis, we then evaluate how the identified variables fare against each other in "horse races"; and we perform further robustness checks.

A main advantage of our empirical approach is that we impose few assumptions *a priori* on what matters: that is, we allow a wide set of factors to influence tolerance. Our priority is to avoid "bad assumptions" about what influences tolerance, which risk being part of more narrow analyses that focus on a particular relationship. Given the state of the literature, which has far from settled how tolerance is shaped, we believe it to be a fruitful approach.

4. Main empirical results

We present our main empirical results in two subsections. *The first* reports systematic tests of how the 46 ancestral-country characteristics, grouped thematically as indicated in Figure 1, predict tolerance. It ends with a "horse-race" test with those variables from the thematic tests that showed a robust relationship to tolerance (having attained a 5% significance level both when entered individually and when entered with the other variables of the group). Exogenous individual-level control variables and country-by-year fixed effects are always included. *The second* presents two mechanical model-specification tests, EBA and LASSO, of which of the 46 variables that predict tolerance. While the preceding tests depend on our choice of how to group the variables thematically, the mechanical tests show what happens when they are grouped according to other principles.

Tolerance regressions: six groups of explanatory variables and a "horse race"

First, we study how *political institutions* in the parents' country of birth relate to the tolerance of second-generation immigrants (see Table A1 in online appendix 1). All variables (democracy, communist regime, political stability, constraints on the executive, impartiality, and professionalism) except communist regime are statistically significant at the 1% or 5% level when added individually, with positive signs in line with our theoretical predictions. When including all variables at once, only democracy is statistically significant, but the *p*-value is 0.055. None of these variables therefore go through to the "horse race."

Second, we look at *culture*. We begin by presenting estimates for Hofstede's five cultural dimensions (individualism, masculinity, pragmatism, power distance, and uncertainty avoidance) – see Table A2 in online appendix 1. Two of them attain statistical significance when added individually, and three of them do when included simultaneously: individualism (positive sign), masculinity (negative sign), and pragmatism (positive sign), where the signs are the expected ones. Pragmatism is the only factor that is strongly significant both on its own and in the cumulative model. A second set of cultural background factors are presented in Table A3 in online appendix 1 and capture what values people think are important to teach children (independence, hard work, feeling of responsibility,

¹²The results are similar if using an ordered Probit or Logit model instead of OLS; these results are available upon request.

imagination, tolerance and respect, thrift, determination and perseverance, religious faith, unselfishness, and obedience). While estimates for five of them are statistically significant when included one at a time, only two are still significant when they are all included: tolerance and respect (positive sign) and religious faith (negative sign).

Third, we examine *development and education*. Each of the six variables – GDP per capita, life expectancy, years of schooling, IQ, non-religious share, and female labor force participation rate – are positive and statistically significant when added one by one (see Table A4 in online appendix 1). But in the cumulative model, only IQ and the female labor force participation rate remain significant.

Fourth, we look at *fractionalization*. All four indicators – income inequality, ethnic fractionalization, religious fractionalization, and genetic diversity – are significantly related to tolerance, and all of them in a negative way (see Table A5 in online appendix 1). They have the same sign and similar significance, both individually and in the cumulative model.

Fifth, we focus on *economic-legal institutions*. The first indicators are the five areas of the Economic Freedom of the World index (size of government, quality of the legal system/protection of property rights, access to sound money, freedom to trade, and regulation). It is clear that one area of economic freedom seems strongly related to tolerance: the quality of the legal system, with a positive sign (see Table A6 in online appendix 1). As argued in Berggren and Nilsson (2013, 2014), a higher-quality legal system can generate tolerance by ensuring that interactions between people are protected under the rule of law, which reduces the risk of opportunistic and exploitative behavior, which in turn enables people to trust and tolerate each other. We also examine the KOF index of globalization (Table A7 in online appendix 1). Even though indicators of both economic and social globalization are positive and significant when included separately, when put together, none of the globalization variables significantly predict tolerance, hence not providing support for the theoretical prediction in this domain.

Sixth, we come to *religion*. We include the religious adherence shares of Christianity, Judaism, Islam, Hinduism, and Buddhism (Table A8 in online appendix 1). The robust finding is a significant negative relation between the share of Muslims and tolerance. While the share of Christians in the ancestral country is positively related to tolerance when entered on its own, the estimate changes to negative and significant in the cumulative model, indicating a non-robust relationship. The Jewish fraction is significant and positive on its own, but it becomes insignificant in the cumulative model. The Hindu fraction is insignificant and negative on its own and becomes significantly negative in the cumulative model.

Last, we come to a *cumulative model with the strongest predictors*, from the six thematic analyses presented above, or a “horse race.” The analysis thus far has uncovered a number of significant predictors of tolerance across a spectrum of possible influences. To examine which of these are the most important we put the variables that are significant at the 5% level or lower (both when included individually and in the combined models) into a cumulative model to see which emerge as significant.¹³ In a second specification GDP per capita in the ancestral country is added to account for the level of development. As can be seen in Table 1, only one of the strong candidates remains statistically significant at 5% or lower: the Muslim share.

Mechanical model-specification tests

The specification with the strongest predictors in Table 1 is based on a grouping of variables guided by a theoretical understanding of what predicts tolerance, along with a selection rule based on variable significance. Since the grouping of variables means that the number of control variables in each table is limited in a particular way, our results might derive from this manner of specifying the models

¹³We also require a sample of at least 42 ancestral countries to include a variable, which corresponds to the number advanced by Angrist and Pischke (2009) in order to have a sufficient number of clusters. The restriction is binding for the economic freedom category.

Table 1. Cumulative model with the ten strongest explanatory variables

Dependent variable: Tolerance towards gay people	(1)	(2)
Pragmatism,	0.267	0.296
ancestral country	(0.138)*	(0.145)**
Tolerance and respect,	0.306	0.294
ancestral country	(0.237)	(0.219)
Religious faith,	0.209	0.229
ancestral country	(0.150)	(0.149)
IQ,	-0.000	-0.002
ancestral country	(0.005)	(0.005)
Female labor force participation,	0.003	0.003
ancestral country	(0.003)	(0.003)
Gini of income,	-0.002	-0.002
ancestral country	(0.003)	(0.003)
Ethnic fractionalization,	-0.121	-0.132
ancestral country	(0.094)	(0.096)
Religious fractionalization,	0.017	0.023
ancestral country	(0.110)	(0.111)
Genetic diversity,	-2.218	-2.435
ancestral country	(1.833)	(1.853)
Muslim fraction 1970,	-0.408	-0.396
ancestral country	(0.082)***	(0.083)***
Log of GDP per capita,		0.022
ancestral country		(0.023)
Individual controls (exogenous)	Yes	Yes
Country-by-year fixed effects	Yes	Yes
R-squared	0.229	0.229
Observations	11,949	11,949

Notes: The dependent variable is attitudes to the statement “Gays and lesbians free to live life as they wish.” Both specifications study second-generation immigrants and estimate the effect of factors in the parents’ country of birth. Individual controls include age, age squared, and gender. Standard errors in parenthesis, which allow for clustering on the parents’ birth country.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

– or there might be severe multicollinearity when similar variables are put into the same regressions (although collinearity tests indicate that this is not a problem). We therefore use alternative approaches to examine which the strongest predictors are.¹⁴

We use three mechanical variable selection methods to assemble “horse races” corresponding to that of Table 1. First, we use EBA¹⁵ to rank all variables by how often they are significant in predicting

¹⁴Because of small sample sizes, we do not include economic freedom variables in these tests.

¹⁵For more on EBA, see for example Sturm and de Haan (2005) and Gassebner *et al.* (2013).

tolerance when all other variables are added in all possible combinations of up to three.¹⁶ This unconditional EBA yields that the Muslim fraction in the ancestral country is significant at the 5% level or lower in 99.98% of all model combinations, which means that it ranks first among all the variables. A number of other variables are also very often significant, as indicated by the fact that the variable ranked tenth is significant in two-thirds of the regressions.

Second, we follow a similar approach, but rank variables based on an EBA conditional on the Muslim fraction. This approach selects the variables that are most frequently significant when the Muslim fraction is always included in the model, along with all combinations of up to three of the remaining variables. The results from this exercise show that the significance shares become lower for other variables (the tenth most frequently significant variable is significant at the 5% level or lower in about 17% of the regressions).

The third mechanical approach, a machine learning method, is fundamentally different. LASSO ranks variables based on how much they contribute to explaining the variation in the outcome variable. LASSO adds a penalty for including variables to the standard OLS objective of minimizing the squared deviations. The LASSO penalty is the sum of the absolute values of the estimated coefficients (betas), and the weight of the penalty is given by the parameter lambda.¹⁷ The absolute values in the penalty induce the operator to set several coefficients to zero and hence shrink the model. By estimating LASSO for a range of lambdas we rank variables by the order they are selected (assigning a non-zero coefficient). The Muslim fraction in 1970 is the first variable selected by LASSO, indicating that it is the most important factor for explaining tolerance. Subsequent variables are selected based on their marginal contribution to explaining tolerance conditional on the already included variables.

For each of the three approaches, we take the top-ten-ranked variables and put them in an OLS regression (with individual controls and fixed effects). This gives us Table 2. All underlying results are available on request. As can be seen, the Muslim fraction is strongly significant in all three specifications based on mechanical variable selection. The results reinforce our finding that the Muslim fraction is the most important and robust ancestral country factor to explain tolerance.¹⁸ Point estimates for the Muslim fraction are very similar in the conditional EBA- and LASSO-based models, while the point estimate is double the magnitude in the unconditional EBA. This appears to be due to issues of multicollinearity in the unconditional EBA, where the Muslim fraction has a VIF of 17 (and the Christian fraction has a VIF of 12).¹⁹ There are no indications of multicollinearity in the conditional EBA or the LASSO models.

5. Extended empirical analysis

We conduct a number of further analyses to investigate the character and robustness of our results.

Sensitivity analysis regarding the Muslim share

We have seen that the Muslim share is uniquely strong in predicting (in)tolerance in all models.²⁰ We undertake four additional tests that demonstrate its robustness even further.

¹⁶The individual controls (age, its square, and gender), as well as all the country-by-year fixed effects, are always in the models – i.e. the other variables, characterizing the ancestral countries, are added to these in all combinations of up to three variables. In all, we conducted 9,177 regressions for each of the examined variables.

¹⁷For a thorough discussion of LASSO, see Hastie *et al.* (2009).

¹⁸The Muslim fraction is strongly significant also when conducting this type of analysis with the top three, five, and eight (rather than the top ten) variables in each of the three mechanical approaches.

¹⁹The VIF for the Muslim fraction is below the usual threshold of ten if the model is restricted to the top five variables.

²⁰How Islam relates to another Western practice, that of the rule of law, is explored by Gutmann and Voigt (2018). Tolerance might be seen as an informal institution about treating people equally; the rule of law might be seen as a formal institution about treating people equally. On p. 355, they write: " [T]he equal treatment of all members of society and the creation of an independent judiciary are less likely than in otherwise comparable societies not under the influence of Islam." This is overall in line with the findings of our study.

Table 2. Models based on mechanical specification

Dependent variable: Tolerance towards gay people Variable selection method:	EBA	EBA	LASSO
	unconditional	conditional	
	(1)	(2)	(3)
Muslim fraction 1970,	-0.630	-0.305	-0.328
ancestral country	(0.155)***	(0.051)***	(0.056)***
Female labor force participation,	-0.002	0.004	
ancestral country	(0.002)	(0.002)	
Years of schooling (1985–95 avg),	0.026		
ancestral country	(0.014)*		
Christian fraction 1970,	-0.106		
ancestral country	(0.133)		
IQ,	-0.003		
ancestral country	(0.005)		
Democracy (polity2),	-0.016		
ancestral country	(0.008)**		
Religious fractionalization,	-0.026		
ancestral country	(0.116)		
Pragmatism,	0.270	0.229	
ancestral country	(0.146)*	(0.118)*	
Non-religious fraction year 1970,	-0.185	-0.324	
ancestral country	(0.202)	(0.221)	
Tolerance and respect,	0.647	0.227	0.034
ancestral country	(0.245)**	(0.248)	(0.250)
Power distance,		0.314	0.239
ancestral country		(0.103)***	(0.099)**
Economic globalization (actual flows),		0.001	0.001
ancestral country		(0.001)	(0.001)
Impartiality,		-0.001	0.070
ancestral country		(0.028)	(0.032)**
Ethnic fractionalization,		-0.111	
ancestral country		(0.085)	
Log of GDP per capita,		0.042	
ancestral country		(0.025)*	
Genetic diversity,			-0.377
ancestral country			(1.082)
Professionalism,			-0.020
ancestral country			(0.027)
Masculinity,			0.006

(Continued)

Table 2. (Continued.)

Dependent variable: Tolerance towards gay people	EBA		LASSO
	unconditional	conditional	
Variable selection method:	(1)	(2)	(3)
ancestral country			(0.105)
Feeling of responsibility,			0.507
ancestral country			(0.199)**
Unselfishness,			0.398
ancestral country			(0.165)**
Individual controls (exogenous)	Yes	Yes	Yes
Country-by-year fixed effects	Yes	Yes	Yes
R-squared	0.240	0.187	0.182
Observations	11001	7987	9498

Notes: The dependent variable is attitudes to the statement “Gays and lesbians free to live life as they wish.” The first specification includes the ten most frequently significant variables according to an unconditional EBA. The second column includes the ten most frequently significant variables according to an EBA conditional on Muslim fraction being in the model. The third specification includes the ten first variables selected by LASSO. All specifications study second-generation immigrants and estimate the effect of factors in the parents’ country of birth. Individual controls include age, age squared, and gender. Standard errors in parenthesis, which allow for clustering on the parents’ birth country.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

1. We include the Muslim fraction in all the cumulative models (in the rightmost columns) of all our thematic regression tables (Tables A1–A8 in online appendix 1) on political institutions, culture, etc. We find that the fraction of Muslims in the ancestral country remains negative and strongly statistically significant in all settings. Results are available on request.
2. The Muslim fraction estimate is not sensitive to the boundary values of the variable, such as comparing homogenous Muslim ancestries to those where no Muslims were present. Restricting the sample, based on the ancestral country Muslim share, from the top or the bottom, yields strongly significant estimates of similar magnitudes. Table A12 in online appendix 2 presents the estimates.
3. The Muslim fraction estimate is not the result of the parents emanating from a particular continent. When excluding ancestral countries from Africa, Asia, the Americas and Europe, respectively, the estimate does not change much and retains its statistical significance. The estimate is reduced and becomes insignificant when only European ancestral countries are included, but this is not surprising given the limited variation in Muslim shares there. Lastly, we add ancestral-continent fixed effects and again reassuringly find that the estimate retains both its size and statistical significance. For details, see Table A13 in online appendix 2.
4. We include five other measures of the influence of Islam in society: membership in the Organization of Islamic Cooperation (dummy), whether Islam is constitutionally entrenched (dummy), the Islamic State Index, the degree to which the constitution denotes the supremacy of Islam (SI-clause) and whether the constitution identifies Islam as a source of legislation (ISL-clause). The three first measures are from Gutmann and Voigt (2015) and the latter two from Gouda and Gutmann (2018).²¹ These measures are all negatively related to tolerance when included on their own, but lose or continue not to display significance when the share of Muslims is included in the model, while the latter predictor always retains its strong significance. Results are presented in Table A14 in online appendix 2.

²¹Gouda and Gutmann (2018) find that discrimination against religious minorities is higher in Muslim countries, but only if they implement Sharia law.

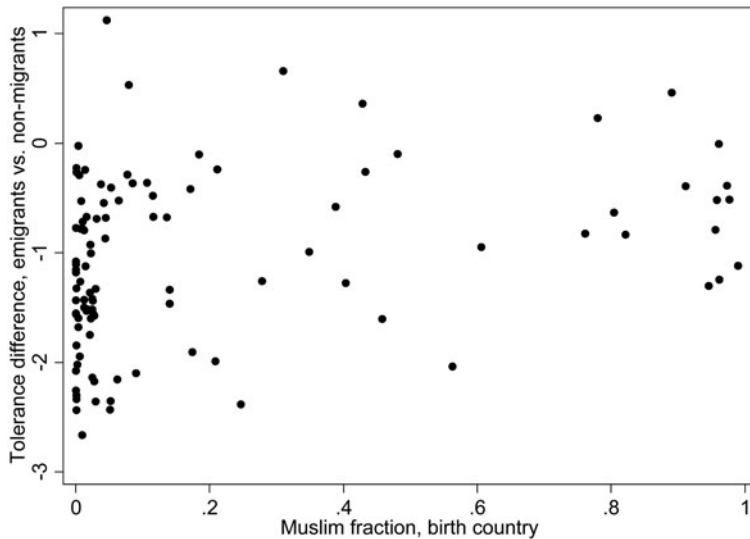


Figure 2. Tolerance differences between migrants and non-migrants across ancestral country Muslim share
 Notes: The vertical axis measures average differences in tolerance between first-generation migrants in Europe and non-migrants across the world by ancestral country. The horizontal axis increases with the Muslim share in the ancestral country.

The sensitivity of the results to the inclusion of further individual control variables

In the analysis so far, we included age, age squared, and gender as individual controls, as these are exogenous to the individual's tolerance level. However, it could be that other individual factors play a role in explaining tolerance and that omitting them biases the results. Even though these other individual control variables risk being endogenous, we included more of them to the specifications of [Table 1](#) and report the findings in [Table A15](#) in online appendix 2. Notably, the Muslim share remains strongly statistically significant throughout this exercise. Among the newly added individual control variables, these are significantly and positively related to tolerance: female, tertiary education, health, and happiness. Four are significantly and negatively related to tolerance: age, being out of the labor force, being a low-income earner, and being married. Also when controlling for these individual characteristics, the Muslim share still plays a large explanatory role (even though the size of the point estimate is somewhat reduced).

The role of selection

Although we study second-generation immigrants who are born and reside in the destination country of their parents, selection of migrants could still be a concern. Uniform selection, if all migrants are a little more (or less) tolerant than the ancestral country average, is not a concern, since the variation used to identify estimates is in the form of differences across ancestries. The concern is if selection is differential in a way that mimics the estimated relationship between tolerance and the ancestral characteristic. In the case of Muslim share we would be concerned if migrants from Muslim countries were less tolerant than non-migrants in their ancestral country and if migrants from non-Muslim countries were more tolerant than the non-migrants. To address this concern, we study first-generation migrants and compare their tolerance to non-migrants in their ancestral country. The tolerance difference between migrants and non-migrants is plotted against the ancestral country Muslim share in [Figure 2](#).²² It would be troubling if the relationship were negative, since that is what we get in the

²²The tolerance of migrants is measured by our independent variable, tolerance towards gay people. For ancestral country tolerance we need data for individuals also residing outside Europe (not covered by the ESS). We thus use the EVS/WVS question if tolerance and respect is a valued child quality. The two tolerance measures are differenced, after the ancestral country measure has been multiplied by five to align the scales.

analysis above, but reassuringly, the relationship in the graph is positive. This indicates that our estimates of the Muslim share could be biased towards zero – the relationship in the graph works against finding a negative relationship between tolerance and Muslim share. Thus, there is no evidence of migrant selection driving our very robust estimate.

Attitudes towards women as the dependent variable

The analysis so far has used tolerance towards gay people as the dependent variable, interpreted by us as an indicator of a liberal value orientation. We here examine another aspect of a liberal value orientation, the attitude towards the statement “Women should be prepared to cut down on paid work for sake of family,” with a higher number indicating stronger disagreement. The results, using the model specifications of [Table 1](#), are reported in [Table A16](#) in online appendix 2. Reassuringly, the share wanting children to learn tolerance and respect is positively, and the Muslim share negatively, related to supporting working women. The results show that the strong factors identified in our analysis predict two dimensions of a liberal value orientation: tolerance towards gay people and a positive view of women’s role in labor market.

Summary of the results of the extended analysis

The Muslim share is a very robust predictor as it is strongly significant, both statistically and economically, in all the models. What other predictors are important? If we look at the findings of [Tables 1](#) and [2](#), no other variable is significant in *all* these “horse races.” This means that their robustness is less clear than for the Muslim share. Still, it is relevant to consider some of the variables. As a starting point, these are the variables that obtain a significance level of 5% or lower in any of the models: democracy, power distance, impartiality, and three attitudes that are valued in children: tolerance and respect, a feeling of responsibility, and unselfishness. In our view, some of these are more credible as predictors of tolerance than the others. If we add the two criteria that a variable should be significantly related to tolerance (at the 5% level or lower) when included on its own in the baseline models ([Tables A1–A8](#) in online appendix 1) and have the same sign throughout all empirical exercises, three variables remain: two values considered important for children – tolerance and respect and a feeling of responsibility – as well as impartiality as an institutional quality. These results point to an important role for both values and institutions in shaping tolerance, in addition to the share of Muslims.

6. Instrumental-variable analysis

What mechanism may explain the very robust finding that the Muslim share in the ancestral countries predicts intolerance? To gain further insight into this issue, and inspired by [Acemoglu and Robinson \(2005\)](#), we conduct an instrumental-variable analysis of the Muslim share using 2SLS. Our first idea is that the negative tolerance effect works through the individual second-generation immigrant being a Muslim her- or himself. Indeed, when using the Muslim fraction in the ancestral country as an instrument, the first stage reveals a strong positive relationship between being a Muslim and stemming from a country with a large Muslim fraction, and the second stage indicates that Muslims express lower tolerance. See column 1 of [Table 3](#). But a second round of tests indicates that there is more to the story.

Our next idea is that the effect might work through the individual second-generation immigrant being religious, making a distinction between Muslims of varying religiosity and noting that non-Muslims can also be religious (even though Muslims express a higher degree of religiosity on average compared to Catholics and Protestants). Column 2 shows that the Muslim fraction in the ancestral country also strongly predicts the individual’s degree of religiosity, and that higher religiosity decreases tolerance. We estimate a model with both variables, being a Muslim and the religious degree, in column 3. In this model with two individual channels we need to add one instrument. We include the non-religious fraction in 1970 in the ancestral country, a plausible factor for predicting the

Table 3. Instrumental-variable analysis

Dependent variable: Tolerance towards gay people					
Instrument(s), ancestral country variables:	Muslim fraction 1970	Muslim fraction 1970	Muslim fraction 1970	Muslim fraction 1970	Muslim fraction 1970
			Non-religious fraction	Non-religious fraction	Non-religious fraction
	(1)	(2)	(3)	Religious faith (4)	(5)
Muslim (reported by the individual)	-1.256 (0.272)***		-0.046 (0.404)	-0.118 (0.308)	0.180 (0.457)
Religious degree (reported by the individual)		-0.237 (0.022)***	-0.228 (0.075)***	-0.207 (0.055)***	-0.264 (0.085)***
GDP per capita, ancestral country					0.024 (0.017)
Individual controls (exogenous)	Yes	Yes	Yes	Yes	Yes
Individual controls (extended)	Yes	Yes	Yes	Yes	Yes
Country-by-year fixed effects	Yes	Yes	Yes	Yes	Yes
F-statistic, instrumenting for Muslim	27.34		13.58	10.81	11.98
F-statistic, instrumenting for religious degree		69.53	35.27	25.67	42.37
Hansen over-identification test (<i>p</i> -value)				0.727	
Observations	14448	14448	14448	13871	13872

Notes: The dependent variable is attitudes to the statement “Gays and lesbians free to live life as they wish.” All specifications study second-generation immigrants, using up to three factors in the parents’ country of birth as instruments for two individual characteristics (being a Muslim and the degree to which they consider themselves to be religious). Exogenous individual controls include age, age squared, and gender; extended individual controls include marital and labor market status, education and income. Standard errors in parenthesis, which allow for clustering on the parents’ birth country.

****p* < 0.01.

individual's religiosity. Interestingly, the religious degree estimate is virtually identical to that of column 2, while the estimate on being a Muslim is close to zero. The results suggest that the mechanism for the very robust result of the Muslim share as a predictor of intolerance is the degree of individual religiosity of the second-generation immigrant rather than the particular type of religion (in line with Berggren and Bjørnskov, 2011, who show that religiosity, not membership of a particular religion, is related to lower social trust).

To examine if there is evidence against the exclusion restriction, we add a third instrument from the ancestral country: the share that thinks that religious faith is an important characteristic in children (another plausible instrument for individual religiosity).²³ In column 4, we report Hansen's *J*-statistic, which shows we cannot reject the null hypothesis that the over-identification restrictions are valid. Lastly, in column 5, we add GDP per capita to the model of column 3, which yields similar results. The estimates on the religious degree are similar, both in magnitude and significance, across specifications. We conclude that the influence of the ancestral country Muslim share works through individual religiosity, not as one might think at first through the individual being a Muslim as such.

7. Discussion and conclusions

Tolerance has many benefits, such as the respectful treatment of minorities, absence of conflict, innovativeness and subjective well-being. A society in which people assess and treat others on their merits rather than on their belonging to a certain group is a more cooperative, open and dynamic place. In a situation where Europe is continuing to receive a large number of immigrants, it becomes interesting to see what determines *their* degree of tolerance, since, in addition to other benefits, tolerance can arguably facilitate their integration into European societies. If one knows what the main determinants are, it becomes easier to try to stimulate the tolerance of those of foreign descent, should one wish to do so.

In this study, we identify factors that explain how tolerant second-generation immigrants are towards gay people, an indicator of liberal values widely held in many European countries today. The factors (46 in total) are features – not least formal- and informal-institutional ones – of the countries in which the parents of these second-generation immigrants were born and grew up, before migrating. By using this type of explanatory variables, we avoid the problem of reverse causality.

Our empirical analysis reveals that one factor stands out: the share of Muslims in 1970 in the parents' country of origin. The higher the share, the lower the tolerance towards gay people. This finding is very robust, as it survives all robustness checks, including mechanical model-specification tests in the form of EBA and LASSO. Regarding other background characteristics, results are more mixed, but we wish to highlight three additional variables that are relatively robustly related to tolerance: valuing tolerance and respect in children, valuing a feeling of responsibility in children and impartial institutions. We have also exchanged tolerance against gay people for another outcome variable indicative of a liberal value orientation, namely, positive attitudes towards women working, and we find that the Muslim share and the share who think that children should learn tolerance and respect are (negative and positive) predictors of this attitude as well. Hence, both formal and informal institutions contribute to shaping the social attitudes of Europe's second-generation immigrants.

When considering how our findings may be useful for policymaking, a first thing to note is that tolerance among second-generation immigrants in Europe seems to be affected by influences from far away and from the past. Conditions in the parents' home countries exercise an influence. This

²³Separate IV estimations using only one instrument at the time suggest that both the ancestral-country non-religious fraction and the share in the ancestral country that states that religious faith is an important characteristic in children are plausible instruments: Both variables strongly predict individual religiosity on their own.

suggests that integration is a long-term process and not always an easy one to shape by political means, especially not when cultural characteristics, such as tolerance, are involved.²⁴

Still, there are implications for both migration and integration policies. To the extent that tolerance is valued, there may be a rivalry between promoting tolerance and accepting migration from countries that had large shares of Muslims, as well as from countries that lack impartial institutions and do not value tolerance or a feeling of responsibility in children.

Notably, our IV analysis reveals that the mechanism at work, linking ancestry from a country with a high Muslim share to intolerance, is individual religiosity. The finding indicates that being a Muslim is not the key avenue through which the influence works – indeed, Muslims can be more or less religious, and non-Muslims can be highly religious as well. This result should mitigate fears that Muslims necessarily introduce less tolerance in European societies and rather points at the central role of devoutness. A process of secularization can reduce the strength of the link between originating from a Muslim-dominated country and intolerance.

Lastly, it bears noting that we have not, due to a wish to focus on proximate, policy-relevant cultural and institutional causes, included an analysis of the “deep” roots of tolerance, locating the *ultimate* determinants of this type of social attitude in factors such as prehistorical events, climate, geography and biogeography. We do, however, consider such a topic suitable for future research.

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²⁴With tolerance as the outcome variable, if one compares the point estimate of the share of Muslims for second-generation immigrants to that for first-generation immigrants, the former is about 58 per cent of the latter, indicating substantial persistence across generations.

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