Tolerance of Homosexuality in 88 Countries: Education, Political Freedom, and Liberalism[1]

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Researchers have repeatedly found a positive correlation between education and tolerance. However, they may be victims of an unrepresentative sample containing only rich Western liberal democracies, where political agenda have a liberalizing effect on curricula. In this paper, we specify the relationship between education and liberal attitudes by analyzing data on educational attainment and tolerance of homosexuality (one dimension of liberalism) drawn from a heterogeneous sample of 88 countries over the period 1981–2014. We argue that nonliberal political agendas in some countries undermine the supposed universality of the positive relationship between educational attainment and tolerance of homosexuality. In relatively free countries, education is indeed associated with greater tolerance. However, in relatively unfree countries, education has no effect on tolerance and in some cases encourages intolerance. Specifically, our analysis demonstrates that education is associated with tolerance of homosexuality only when regimes energetically promote liberal-democratic values. The larger theoretical point is that the agendas of political regimes shape civic values partly via education systems. Especially in an era when democracy is at risk in many countries, it is important to recognize that education is not always a benign force.

KEYWORDS: democratization; education; homosexuality; modernization; political freedom; tolerance.

INTRODUCTION

A widespread value shift in the direction of liberalism was evident in much of the world from the end of World War II until the end of the twentieth century (Adamczyk 2017; Gibson 1992; Inglehart and Baker 2000; Welzel and Inglehart 2005). Since then, the pattern has been reversed in some countries (Freedom House 2018; Walker 2015). Although social scientists are just beginning to explore the sources of the twenty-first-century pattern reversal (Brym 2016a, 2016b; Inglehart 2016; Inglehart and Norris 2016), they have identified a variety of factors contributing to patterns of value change in the second half of the twentieth century. These factors include the effects of economic development, upward mobility, and increasing educational attainment, mediated by cultural background and religiosity (Bobo and Licari 1989; Inglehart and Baker 2000; Schwadel and Garneau 2017; Treas 2002).

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A prominent theme in this literature is that increasing educational attainment fosters liberalism and tolerance, with some claiming the effect is realized through a socialization mechanism (Meyer 1977) and others through growing cognitive sophistication (Bobo and Licari 1989; Coenders and Scheepers 2003). Despite the different proposed routes to liberalism presumably caused by education, the consensus is that, universally, education liberalizes people, and well-educated individuals are typically more tolerant than others (Andersen and Fetner 2008; Campbell and Horowitz 2016; la Roi and Mandemakers 2018; Ohlander, Batalova, and Treas 2005; Pampel 2016; Treas 2002).

We contend that this consensus requires modification. Stated plainly, the commonly held idea that education liberalizes citizens may be the victim of selection and confirmation bias. Previous work has relied largely on findings from advanced industrialized societies, most of which are rich, Western, and democratic (Andersen and Fetner 2008; Coenders and Scheepers 2003; la Roi and Mandemakers 2018; Ohlander et al. 2005; Treas 2002). Moreover, the consensus concerning the effect of educational attainment on liberalism is built mainly on data from the second half of the twentieth century, although even analysts using twenty-first-century data have tended to join the chorus, reiterating the presumably liberalizing effects of educational attainment (Adamczyk 2017; la Roi and Mandemakers 2018; Milligan 2012; Ohlander et al. 2005). In our judgment, these shortcomings have limited our understanding of the way in which different contexts attenuate or even reverse the presumed universally positive association between educational attainment and liberalism.

We begin the task of qualifying the consensus view by analyzing an economically, culturally, and politically heterogeneous sample of 88 societies during the last two decades of the twentieth century and the first 15 years of the twenty-first century. This procedure minimizes selection bias and maximizes variation in the contexts of interest. Specifically, in our sample, gross domestic product (GDP) per capita ranges from $190 to $69,095 (measured in 2005 U.S. dollars), the Gini coefficient of income inequality ranges from 19.75 to 60.78 on a scale of 0 to 100, and the Freedom House index of political freedom ranges from 1 to 7 on a scale of 1 to 7. Including all waves of the World Values Survey (WVS) maximizes variation on all these variables. The cultural diversity reflected in the data also grows: the percentage of observations from the Catholic and Protestant world goes down while the percentage of observations from African, Confucian, and Islamic societies increases. To our knowledge, ours is the most heterogeneous sample ever used to test the hypotheses under consideration.

Borrowing from the study of nondemocratic societies, we hypothesize that education is not always a liberalizing force (Liñán 2010; Zhao 1998). The direction of educational effects depends on context, especially political context. In some societies, education can even deliberalize parts of the citizenry. This is particularly the case when an illiberal political agenda guides the formulation of educational curricula and when upward mobility is linked to political conformity. Simply put, one mechanism that links educational attainment to liberalism and tolerance is the degree of political freedom in society.

To test our hypothesis, we focus on how education affects tolerance of homosexuality, an important aspect of liberal attitudes (Adamczyk 2017; Andersen and Fetner 2008; Loftus 2001; Ohlander et al. 2005). We employ 1981–2014 data from the WVS and use multilevel modeling to test whether the role of education differs across contexts. Our analysis shows that political freedom does moderate the role of education. Specifically, in politically free societies, education plays a liberalizing role, as previous studies have found; but in nonfree societies, education either has no effect or a negative effect on tolerance of homosexuality. The interaction effect between education and political freedom remains significant even after controlling for a variety of economic and cultural factors.

Our main finding is timely. It reminds us of the danger of authoritarianism at a moment in history when some regimes, including those of Austria, China, Hungary, Israel, Poland, Russia, Turkey, and the United States, are becoming more illiberal (Inglehart and Norris 2016; Walker 2015). The larger theoretical significance of our research is that it points to how the decline of political freedom is likely to have enduring illiberal consequences via education systems.

EDUCATIONAL EFFECTS: SOPHISTICATION, SOCIALIZATION, AND VALUE LIBERALIZATION

Liberalism spread widely and embedded itself deeply after World War II, especially in rich Western societies. People tended to become more open-minded, tolerant of various lifestyles, and trusting of each other (Gibson 1992; Welzel and Inglehart 2005). On average, they became more favorably disposed to equality, minority rights, environmental protection, sustainable development, and sexual diversity. The value shift was especially important because individuals and their opinions were also becoming increasingly influential in a wide array of institutions, especially so in democratic societies (Frank and Meyer 2002; Robinson 2011). Scholars were eager to account for the liberalization of values. Modernization theorists were especially influential in this regard. They attributed value liberalization largely to economic factors, holding that affluence at the aggregate and individual levels frees people from survival concerns and allows them to pursue "higher-level" needs (Inglehart and Baker 2000).

Many empirical studies confirm that societal affluence and high individual socioeconomic status lead to liberal attitudes (Andersen and Fetner 2008; la Roi and Mandemakers 2018; Loftus 2001; Ohlander et al. 2005; Pampel 2016; Zhang, Brym, and Andersen 2017). These studies also demonstrate that economic development brings about the expansion of education in modern societies (Meyer et al. 2007; Schofer and Meyer 2005). The development of education, especially higher education, is seen as an important factor in fostering liberal and tolerant personhood (Campbell and Horowitz 2016; Dey 1997; Meyer et al. 2007; Treas 2002). Specifically, education is associated with many components of liberal values, including trust in others (Easterbrook, Kuppens, and Manstead 2016), civic participation (Saha 2000; Welzel and Inglehart 2005), tolerance of immigrants (Kehrberg 2007),

gender equality (Campbell and Horowitz 2016), and tolerance of homosexuality (Pampel 2016; Treas 2002).

Research further establishes that the positive impact of education on liberal personhood is realized through two main mechanisms (Kingston et al. 2003). First, education encourages cognitive sophistication, giving people the intellectual tools necessary to move from closed-mindedness to open-mindedness (Bobo and Licari 1989). Second, education is a socialization process in the course of which mainstream values and dominant ideologies are internalized (Coenders and Scheepers 2003; Meyer 1977). Socialization occurs partly through instruction and partly through interaction in an environment where students are exposed to peer influence and diverse populations, opinions, and lifestyles (Bowman 2010; Dey 1997). Students thus tend to emerge from educational institutions more prepared to embrace diversity and tolerance than was the case for earlier generations (Kehrberg 2007). Over time, changes within generations and cohort replacement elevate the mean level of liberalism in society.

Education and ensuing value liberalization have enduring social consequences, not least because liberal individuals, education systems, and larger social contexts reinforce each other. For instance, by means of elections, lobbying, and social movements, individuals who support lesbian, gay, bisexual, transgender, and queer (LGBTQ) communities have demanded and to some extent achieved curricular reform reflecting tolerance of sexual minorities (Kane 2003). Responsive governments and education systems, again mainly in democratic societies, make corresponding adjustments and reflect citizen demands. Revised textbooks and curricula then reinforce tolerance among youth, generating stronger liberal peer influence and more exposure to diverse opinions. In short, most public opinion scholars, political scientists, and sociologists of education believe that the growth of education has promoted liberal attitudes for three-quarters of a century. However, they have largely ignored how education can act as a neutral or deliberalizing force in some circumstances, a subject to which we now turn.

CAN EDUCATIONAL EFFECTS ON LIBERALISM BE NEUTRAL OR NEGATIVE?

Early studies on the relationship between educational attainment and liberalism concerned individual attitudes in one or a few countries (Gibson 1992; Loftus 2001; Treas 2002; Weil 1985). More extensive comparative work was done later, but most of it remained focused on rich Western democracies (Andersen and Fetner 2008; Coenders and Scheepers 2003; Kehrberg 2007; van den Akker, van der Ploeg, and Scheepers 2013). Some analysts purposively excluded other types of societies. For instance, Coenders and Scheepers (2003:321) compared 22 societies using data from the International Social Science Program but excluded the Philippines, the only non-industrial society in the data set. While such samples may have been appropriate for the researchers' purposes, they are insufficient if one's analytical goal is to determine whether education works differently across economic, cultural, and political contexts.

A few scholars have suggested that the liberalizing effect of education is embedded in social environments and varies cross-nationally. For example, Weil (1985)

argued that a liberal-democratic regime's longevity is an important contextual determinant of the strength of the education effect on liberalism. Presumably, education has a less liberalizing effect in new democracies than in those that have been around longer. Abramson and Inglehart (1994:800) noted that "higher education does tend to support democratic values, but this relationship reflects specific historical conditions and is not an automatic consequence of education." They cited two cases where educational attainment appears to have been inversely associated with liberalism. However, they lacked data from representative surveys to add substance to their observation. Nor did they take up this line of argument in subsequent work; instead, they emphasized how higher education and liberal values tend to go hand in hand. Nonetheless, following their early argument, we hypothesize that there are situations in which education does not elicit liberal attitudes and may even prompt illiberal attitudes. The question is, in what kinds of social contexts does education play a neutral or deliberalizing role? We believe that the key to answering this question lies in a society's political context, particularly its level of political freedom.

POLITICAL FREEDOM, POLITICIZED EDUCATION, AND VALUE CHANGE

We contend that political freedom is a key determinant of the way in which education influences public opinion. Of course, even in relatively free societies, freedom of speech is far from absolute. Minorities lacking power are relatively voiceless; some media messages dominate. Values and ideologies nonetheless compete for support in the public sphere, fostering a relatively diverse and tolerant political culture.

In contrast, authoritarian governments must tightly control education and the mass media to remain in power (Zhao 1998). Consequently, public opinion is more centrally organized and homogeneous, and the public tends to be more obedient. Voices advocating citizen participation, individual and collective autonomy and political reform are muted. Voices advocating respect for established authority and traditional values are encouraged. Instead of promoting tolerance, authoritarian regimes tend to encourage nationalism and xenophobia, partly to divert domestic discontent (Weiss 2014). They reward citizens for political loyalty and punish them for disobedience (Acemoglu and Robinson 2001). Liberal attitudes are discouraged, and illiberal ideas become relatively popular.

Lack of political freedom is certainly detrimental to the tolerance of LGBTQ communities. Many authoritarian governments oppose activism on the part of sexual minorities. Putin's Russia and Xi Jinping's China are cases in point (Makarychev and Medvedev 2015; Nathan 2015; Zheng 2015). To maintain social stability and maintain popularity among nationalist supporters, such regimes tend to treat LGBTQ groups and activists with hostility. As Makarychev and Medvedev (2015) contend, Russia's conservative approach to sexual orientation is intended to help the authorities retain their legitimacy as patriotic defenders of Russian values, culture, and traditions.

Students of nationalism and cultural hegemony emphasize that, to varying degrees, all modern states have the capacity and the motivation to foster a collective mind-set among their citizens (Gellner 1994; Gramsci 2009). Characteristically, Gellner argues that since the Industrial Revolution, the rising complexity of societies has required that states maintain a cultural infrastructure shared by its citizens. According to Gellner, state-endorsed formal education is the key to forging a cultural infrastructure insofar as it institutionalizes value transmission and consensus construction and is compulsory up to a certain level (cf. Barber 2012). Research further confirms that modern governments tend to strongly influence the content of curricula, the direction of education policies, and the level and focus of investment in education and research (Jowett and O'Donnell 2014; Saha 2000).

Significantly, however, democratic regimes have less incentive than do nondemocratic regimes to do so because they permit and even encourage a higher level of diversity and competition in the marketplace of ideas. Authoritarian governments tend to rely more heavily on explicit instruction about the virtues of the domestic social order and the dangers of foreign ideas and practices. That is why Chinese history books are full of anti-Japanese propaganda and why the political ideology of Xi Jinping, recently elevated to president for life, is becoming an integral part of the Chinese curriculum (Weiss 2014; Zhao 1998). As Chinese education minister Chen Baosheng said in late 2017, Xi Jinping thought will now "go into textbooks, into classes, and into the brains [of students]" (quoted in Zhou 2017).

Given the modern state's motivation, capacity, and institutional means to shape public opinion, and the greater incentive of nondemocratic regimes to exercise social and political control, the existence of an interaction effect between political context and individual education attainment seems to us entirely plausible. Accordingly, we test three hypotheses. First, we examine whether political freedom is indeed associated with liberal attitudes, here indicated by the tolerance of homosexuality. We find that it is. Second, we examine whether political freedom moderates the impact of education. We find that it does. Educational achievement has different effects on free and nonfree societies. Third, we determine whether the effects we discover are robust when controlling for other variables recommended by previous theory and research. Again, our conclusion is in the affirmative. Hence, our hypotheses:

- Hypothesis 1: Political freedom is significantly and positively correlated with tolerance of homosexuality.
- Hypothesis 2: Political freedom conditions the effect of education on tolerance of homosexuality. The freer a society, the greater the liberalizing influence of education on tolerance of homosexuality.
- Hypothesis 3: The conditioning effect of political freedom on tolerance of homosexuality persists after controlling for other potentially relevant factors.

METHODOLOGY

Data Source

We use data from the WVS to study tolerance of homosexuality globally. All six waves of the WVS (1981–2014) contain information on tolerance of homosexuality and other relevant sociodemographic variables. The data set covers 99 societies with 242 country-year observations, thus offering considerable variation in affluence, inequality, cultures, and dominant religions and political freedom. The wide range of cases allows us to control for a variety of pertinent contextual features and isolate the unique effect of political freedom.

The original data set was composed of 344,255 respondents. We added contextual-level variables from authoritative secondary sources to the data set, including an index of political freedom, the Gini coefficient, GDP per capita, and cultural region. Details concerning contextual variables are given later. To deal with missing data, we excluded countries with missing information on critical variables. We then generated five imputed data sets and pooled them for analysis. After data cleaning, multiple imputations and deletion of two country-years based on reliability checks, 287,490 complete observations in 88 countries and 214 country-year observations (85.96% of the original sample size) remained for analysis.

Dependent Variable

In this study, we set tolerance of homosexuality, an important indicator of overall liberal attitudes, as our dependent variable. We select question F118 from the WVS, where respondents were asked, "For the following behaviors [homosexuality being one of them], please tell me whether you think it can always be justified, never be justified, or something in between." The tolerance measure is a 1–10 scale. A score of 1 means "always justifiable," the most tolerant response. A score of 1 means "never justifiable," the least tolerant response. This item is measured consistently across societies and in different survey waves, making it a good measure for comparative analysis.

As a test of robustness, we reran our final model with the only available alternative dependent variable, question A124-09 from the WVS—a binary item tapping respondents' tolerance of having homosexual neighbors. We briefly discuss findings from multilevel logistic models regarding the alternative dependent variable in the results section below.

Individual-Level Variables

Studies show that gender, age, marital status, religious affiliation, and participation and occupational status are significant individual-level correlates of tolerance (Andersen and Fetner 2008; Milligan, Andersen, and Brym 2014). Therefore, these variables serve as our control variables. Gender is a dummy variable (female = 0, male = 1). Age ranges from 18 to 99 years. Marital status is collapsed into three

categories: single/never married (the reference group); married or cohabiting; and widowed, separated, or divorced.

Religious affiliation and participation are categorical variables. For religious affiliation, people who report being nonreligious or atheist serve as the reference group. We created seven dummy variables for people who identify with Protestantism; Catholicism; Christian Orthodoxy; Islam; Hinduism and other South Asian religions; Buddhism, Taoism, and other East Asian religions; and other religions. The frequency of participation in religious activities is an important indicator of religiosity and is likely to influence an individual's opinion of homosexuality. We collapse the categories of this variable as follows: "not at all" (the reference group), "less than yearly," "yearly," "monthly," "weekly," and "daily or more frequently." The occupation variable has eight categories: unemployed (the reference group), student, retired, unskilled manual labor, skilled manual labor, nonmanual office worker, professional, and manager or owner.

The focal predictor at the individual level is educational attainment. Education levels are recoded into five categories: none or little formal education (the reference group), elementary school completed, middle school completed, high school completed, and college or university degree and above. For a few societies where education is measured as years in school instead of attained degrees, we recoded as follows: 0–5 years (none or little education, which is the reference group), 6–8 years (elementary school completed), 9–11 years (middle school completed), 12–14 years (high school completed), and 15 years and above (college/university/higher levels).

Our fitted models use individual-level weights provided in the WVS data set. We compared weighted and unweighted results and found that estimates, significance tests, and interaction effects are consistent before and after weighting. Modeling results and effect plots are available from the authors on request.

Contextual-Level Variables

Previous studies argue that the level of economic development (Inglehart and Baker 2000), inequality (Andersen and Fetner 2008; Milligan et al. 2014; Zhang et al. 2017), and culture zone (Flanagan and Lee 2003; Huntington 1993) are significantly associated with liberalism. Therefore, we control for these contextual variables. GDP per capita serves as our measure of economic development, with purchasing power parity figures converted into 2005 U.S. dollars (World Bank 2017). The Gini coefficient of inequality comes from the Standardized World Income Inequality Database (Solt 2009). It is based on household disposable income (post-tax, post-transfer) using data from the Luxembourg Income Study. Culture zone is a set of dummy variables that take account of the constructed cultural traditions and dominant religions suggested by Huntington (1993) and Schwartz (2006): Western Europe and North America (the reference group); Catholic/Latin America; Orthodox/Eastern Europe and Russia; Islamic/Middle East and North Africa; sub-Saharan Africa; India/South Asia; and Confucian/East and Southeast Asia.

The focal predictor at the contextual level is political freedom, with data provided by Freedom House (2014). Freedom House's political freedom index ranges from 1 to 7, with intervals at a distance of 0.5 points. A value of 1 represents the freest societies (e.g., Sweden) and 7 the least free (e.g., North Korea). The Freedom House index is perhaps the most widely used measure of democracy in the academic community. It is recalculated annually by about 130 academic, think tank, and human rights experts, who score countries on multiple aspects of political rights and civil liberties using news articles, academic analyses, reports from nongovernmental organizations and individual professional contacts. Their scores are combined to form the index. See Table I for a summary of all independent and dependent variables based on the pooled, imputed data set. We also provide the scatterplot between our two focal variables: the Freedom House index and the tolerance of homosexuality score in Fig. 1. Figure 1 is based on the national Freedom House index and the national average score of tolerance of homosexuality; for countries surveyed for multiple waves in the WVS data, we plot their average tolerance and freedom scores across different years. Figure 1 illustrates the existence of a positive association between political freedom and tolerance.

Statistical Methods and Modeling Strategy

For our analysis, we use ordinary least squares (OLS) with hierarchical linear modeling (HLM) because HLM identifies both individual-level and contextual-level effects, the goal of our study.[4] Our analysis assumes a clustered structure for modeling: individual respondents (level 1) are nested within country-year observations (level 2), and country-year observations are nested within countries (level 3). Thus, Canadian respondents are embedded in level-2 contexts "Canada-1981," "Canada-1990," and "Canada-2000." All three of these level-2 contexts are embedded in the level-3 "Canada" context. This modeling strategy incorporates change over time within a society and variation between societies. To test our hypotheses, we examine statistical models in the following sequence:

- Model 1: individual predictors + education + political freedom
- Model 2: individual predictors + education * political freedom
- Model 3: model 2 + all contextual predictors.

Model 1 predicts the influence of all relevant individual-level variables that we have identified plus one contextual-level variable: political freedom. It is our baseline model, allowing us to test hypothesis 1, which asserts the existence of a significant and positive association between political freedom and tolerance of homosexuality. Model 2 adds interaction terms between political freedom and individual education attainment to Model 1. It tests hypothesis 2, which asserts that political freedom moderates educational effects. Model 3 adds other contextual-level variables that we have identified as relevant to our discussion: GDP per capita, the Gini coefficient, and cultural zone. It allows us to test hypothesis 3, which asserts that the

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[4] Figure 1 suggests a nonlinear association. We tested our models with a logged dependent variable but found only trivial differences compared to OLS, so we opted for OLS for ease of interpretation.

Table I. Individual- and Contextual-Level Variables (Imputed Data)

| Variable	N	Percentage or Mean (S.D. in Parentheses)
INDIVIDUAL		
Gender		
Female (= 0)	147,318	51.24%
Male	140,172	48.76%
Age		
In years (18–99)	287,490	40.76 (16.19)
Level of education		
None/Little (= 0)	32,636	11.35%
Elementary	58,924	20.50%
Middle school	74,507	25.92%
High school	72,711	25.29%
College or above	48,712	16.94%
Marital status		
Never married (= 0)	73,608	25.60%
Married or cohabiting	181,847	63.26%
Divorced, separated, or widowed	32,035	11.14%
Job		
Not employed (= 0)	60,222	20.95%
Student	25,744	8.95%
Retired	20,471	7.12%
Unskilled manual worker	27,608	9.60%
Skilled manual worker	49,091	17.08%
Nonmanual office worker	30,048	10.45%
Professional	34,091	11.86%
Manager/owner	40,215	13.99%
Religion		
None/atheist	56,638	19.72%
Protestant	44,877	15.59%
Catholic	74,432	25.89%
Orthodox	33,010	11.48%
Islamic	47,839	16.64%
Hindu and South Asian folk religions	8,676	3.02%
Buddhist, Taoist, and East Asian folk religions	11,027	3.84%
Other religions	10,996	3.82%
Frequency of religious practice/participation		
Not at all	62,067	21.59%
Less than yearly	31,760	11.05%
Yearly	67,065	23.33%
Monthly	33,997	11.83%
Weekly	52,157	18.14%
Daily or more frequently	40,444	14.07%
CONTEXTUAL		
GDP per capita (in thousands of 2005 USD)	214	11.366 (14.203)
Gini coefficient	214	0.39 (0.10)
Culture zone		
Western Europe/North America	41	19.16%
Catholic/Latin America	53	24.77%
Orthodox/Eastern Europe and Russia	34	15.89%
Islamic/Middle East and North Africa	27	12.62%
Sub-Saharan Africa	21	9.81%
India/South Asia	6	2.80%
Confucian/East and Southeast Asia	32	14.95%
Freedom House index		
(range 1–7; 7 = least free)	214	3.04 (1.76)
Liberal index		
(range 1–10; 10 = most liberal)	287,490	3.18 (3.03)
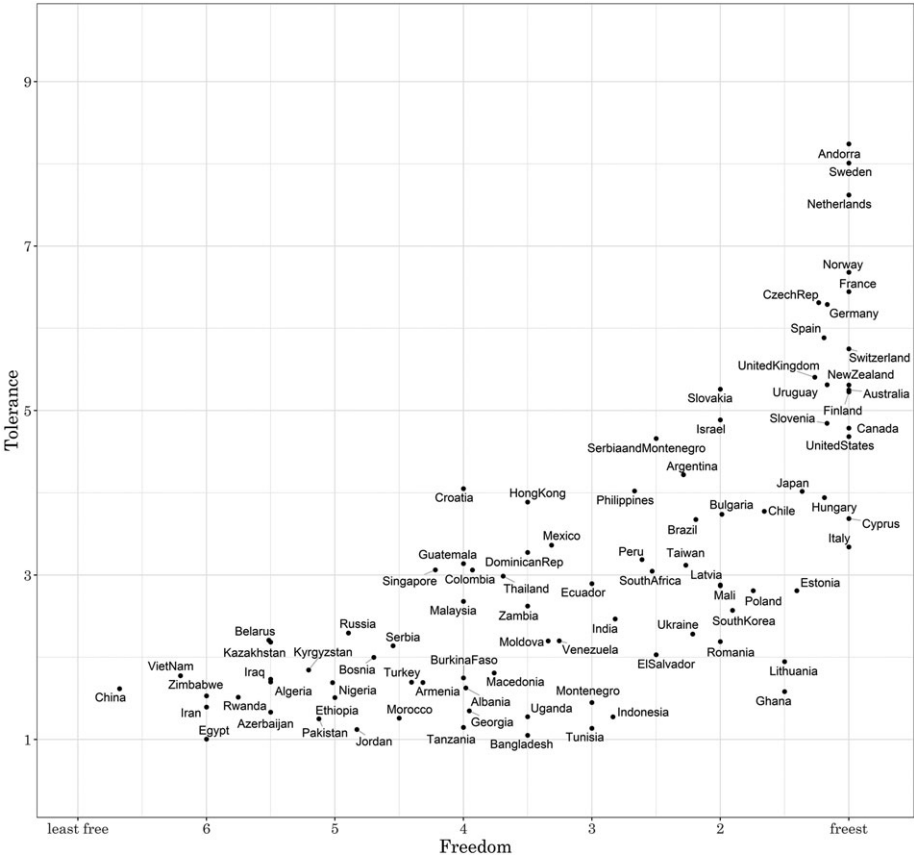
Fig. 1. Political Freedom and Tolerance by Country
Note: Measures of tolerance are based on 1981–2014 WVS data. Values of political freedom are from Freedom House (2015). We use average values for countries surveyed in multiple waves.

moderating effect of political freedom is robust, net of other possible contextual causes of variation in the dependent variable. Since the interaction terms involve individual education attainment, all three models include terms of educational random effects at the country-year observation level (level 2). Including the random terms allows the educational effect to vary across different social contexts. This is important because the research goal is to see whether social context conditions the educational effect.

RESULTS

Table II displays the results from the HLM models predicting tolerance of homosexuality. In our discussion of the results, we focus on the magnitude of effects rather than tests of statistical significance. That is because, with 287,490 cases, nearly

Table II. Estimates for HLM Models Predicting Attitude to Homosexuality

	Model 1	Model 2	Model 3
Intercept	4.26***	4.05***	2.69**
Survey wave (Reference: Wave 1)			
2	−0.08	−0.05	0.32
3	0.47*	0.51*	1.11***
4	0.53*	0.57*	1.23***
5	1.09***	1.13***	1.76***
6	1.19***	1.23***	1.86***
Gender (Men = 1)	−0.35***	−0.35***	−0.35***
Age	−0.02***	−0.02***	−0.02***
Marital status (Reference: Single)			
Married/Cohabiting	−0.13***	−0.13***	−0.13***
Divorced/Separated/Widowed	−0.03	−0.03	−0.03
Occupation (Reference: Unemployed)			
Student	0.16***	0.17***	0.16***
Retired	0.01	0.01	0.01
Unskilled Manual	0.06**	0.06**	0.06**
Skilled Manual	0.12***	0.12***	0.12***
Nonmanual Office	0.29***	0.29***	0.29***
Professional	0.30***	0.30***	0.30***
Manager/Owner	0.21***	0.22***	0.21***
Religious affiliation (Reference: Not religious)			
Protestant	−0.55***	−0.55***	−0.55***
Catholic	−0.24***	−0.24***	−0.24***
Orthodox	−0.33***	−0.33***	−0.32***
Islamic	−0.66***	−0.66***	−0.66***
Hindu and South Asian folk religions	−0.51***	−0.51***	−0.51***
Buddhist, Taoist, and East Asian folk religions	−0.30***	−0.30***	−0.30***
Other religions	−0.55***	−0.55***	−0.55***
Religious practice (Reference: Never)			
Less than yearly	−0.22***	−0.22***	−0.22***
Yearly	−0.24***	−0.24***	−0.24***
Monthly	−0.39***	−0.39***	−0.39***
Weekly	−0.65***	−0.65***	−0.65***
Daily or more frequently	−0.72***	−0.72***	−0.72***
Education (Reference: None/little education)			
Elementary school completed	0.08*	0.39***	0.39***
Secondary school completed	0.23***	0.83***	0.84***
High school completed	0.48***	1.40***	1.40***
College or above	0.87***	2.07***	2.08***
Contextual-level predictors			
Freedom House Index (7 = least free)	−0.20***	−0.15**	0.14**
GDP per capita (log)			0.25**
Gini coefficient (0–100)			−0.01
Culture zone (reference: Western Europe/North America)			
Catholic/Latin America			−1.23***
Orthodox/Eastern Europe and Russia			−2.40***
Islamic/Middle East and North Africa			−2.84***
Sub-Saharan Africa			−2.07***
Hindu/South Asia			−1.77*
Confucian/East and Southeast Asia			−2.15***
Freedom * education interactions			
Elementary school completed		−0.11***	−0.11***
Secondary school completed		−0.21***	−0.21***
High school completed		−0.32***	−0.32***
College and above		−0.41***	−0.42***

Table II.   (Continued)

	Model 1	Model 2	Model 3
Random Effects			
Level 3: country intercept	1.13***	1.15***	0.54***
Level 2: country-year intercept	0.27***	0.27***	0.35***
Education			
Elementary school completed	0.12***	0.08***	0.09***
Middle school completed	0.36***	0.23***	0.23***
High school completed	0.81***	0.51***	0.51***
College and above	1.33***	0.83***	0.83***
AIC	1,318,160	1,318,098	1,318,037
BIC	1,318,699	1,318,679	1,318,703
Number of individual observations	287,490	287,490	287,490
Number of country-years	214	214	214
Number of countries	88	88	88

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

all variables turn out to be statistically significant. Therefore, whether one or another predictor is statistically significant is of little or no use adjudicating between models.

Model 1 presents all the individual-level fixed effects, the fixed and random effects of education and the effect of political freedom, the focal contextual-level variable. The main findings from model 1 concern the effect of education at the individual level and political freedom at the contextual level. The results substantiate previous studies and are consistent with hypothesis 1.

Specifically, model 1 shows that the magnitude of the effect of political freedom on tolerance of homosexuality is considerable. A difference of one unit on the 7-point Freedom House index is associated with a 0.20-point difference on the 10-point tolerance scale. This means that the freest societies (e.g., Sweden in 2006) are 1.20 points higher on the dependent variable than the most unfree societies (e.g., China in 2007). A 1.20-point difference is approximately equal to the difference between China and Taiwan in tolerance of homosexuality (see Fig. 1) or the increase in tolerance of homosexuality in Spain between 1995 and 2007. In that 12-year period, Spain witnessed the legalization of same-sex marriage and adoption, the creation of registries for same-sex couples in nearly all the country's autonomous communities and cities, and the military police granting same-sex couples permission to cohabitate in military barracks—a world first.

The focal variable at the individual level is educational attainment. Model 1 shows that tolerance grows as educational level increases, a finding that, as we have seen, is supported by many other studies. A person who completed college scores 0.87 points higher on the tolerance scale than a person with little or no formal education.

Findings on other predictors are consistent with previous studies. For one thing, respondents in later waves of the survey are more tolerant, indicating a liberalizing trend over time. For another, the model shows that male, married, older, and religious respondents are less tolerant than female, unmarried, younger, and nonreligious respondents. Occupation matters, too. Unemployed and unskilled

manual laborers are the least tolerant, while professionals, office workers, and students are the most tolerant.

Model 2 includes the interaction of education with political freedom. Two findings are noteworthy. First, the coefficients of the interaction terms are all negative. Given the coding of the Freedom House index (1 = freest, 7 = most unfree), the negative estimates mean that the effect of educational attainment on tolerance of homosexuality is strongest in the freest political contexts. Third, the estimates for the interaction terms decrease steadily from –0.10 (elementary school * freedom) to –0.41 (college and above * freedom). Thus, for people with college or higher degrees, living in the freest society versus the least-free society makes a large 2.46-point difference. The gap is smaller for people with less education; for people who completed elementary school, it is 0.66 points. This pattern suggests growing attitudinal divergence as educational attainment increases. People with a low level
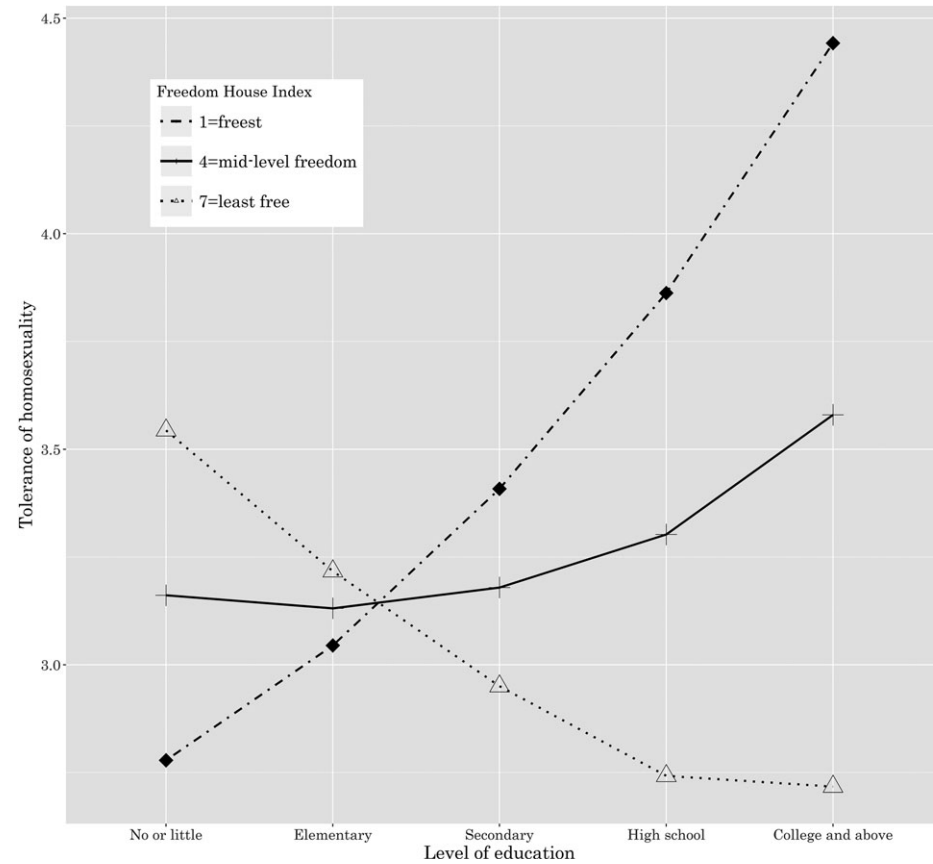

Fig. 2. The Interaction Effect of Political Freedom and Education on Tolerance of Homosexuality
Note: Fitted values are from model 3. All variables except education and freedom are set to typical values (means for quantitative variables and proportions for categorical variables).

of educational attainment tend to have more similar attitudes regarding homosexuality than do people with a high level of educational attainment. Other estimates are consistent with model 1. The addition of the interaction terms has the effect of making the random components of model 2 smaller than those of model 1. Together with the decreasing Akaike information criterion (AIC) and Bayesian information criterion (BIC) values (see below), the smaller random components of model 2 suggest that including the interaction improves the model fit.

Model 3 shows that the magnitudes of the estimates change little from model 2. Thus, the findings from model 1 and model 2 on education and freedom remain when other contextual variables are included. Figure 2 vividly illustrates the persistence of the interaction effect of political freedom with education on tolerance in model 3. For societies with a moderate level of political freedom, the association between level of education and tolerance of homosexuality is *somewhat* positive. For societies with a high level of political freedom, the association between level of education and tolerance of homosexuality is *strongly* positive. For countries with a low level of political freedom, the association between level of education and tolerance of homosexuality is strongly *negative*. Education makes people more tolerant in free societies, but in unfree societies, education lowers the level of tolerance. This finding demands qualification of conventional wisdom regarding the relationship between educational attainment and tolerance.

Examining the goodness-of-fit statistics, we see that the AIC decreases as we move from model 1 to model 2 to model 3, indicating improved goodness-of-fit across models. The BIC is a more demanding statistic than the AIC because it penalizes more heavily for the number of predictors in the equation. We find that the BIC for model 2 is lower than the BIC for model 1. However, the BIC for model 3 is somewhat *higher* than the BIC for model 2. We nonetheless conclude that model 3 is the superior model. The BIC penalty per parameter is equal to ln(n)—in our case, ln(287,490) = 12.569. Insofar as model 3 contains eight more parameters than model 2, the penalty is 8 * 12.569 = 101. Yet we find that the difference between model 2 and model 3 in their BIC values is only 24. Such minimal inflation in the BIC despite the large increase in the number of predictors increases our confidence in model 3 over model 2. Adding to our confidence is an analysis of deviance, which found that model 3 is significantly better than model 2 ($p < .001$).

Model 3 is also preferable because it controls for GDP per capita, the Gini coefficient of inequality, and dominant culture and religion. These controls are important theoretically and substantively. Model 3 shows that GDP per capita and the Gini coefficient are not as influential as previous researchers have found. The log of GDP per capita is 0.25. The log of GDP per capita ranges from 5.25 to 11.14 (representing raw values ranging from US$190 to US$69,095). Despite this enormous difference, the richest society is just 1.47 points more tolerant on the 10-point scale than the poorest society in the data set. In other words, economic development matters, but not as much as most researchers tend to think (Inglehart and Baker 2000; Welzel and Inglehart 2005).

The Gini coefficient has no influence on tolerance despite the large size of our sample. This finding challenges previous reports, which have found an effect for the Gini coefficient (Andersen and Fetner 2008). Cultural and religious backgrounds

Table III. BICs for HLM Models With Different Interaction Effects Between Education and Contextual Variables

Interactions in the Model	BIC
Model 3 includes education * freedom	1,318,703
Model 3 excludes education * freedom; includes education * GDP	1,318,764
Model 3 excludes education * freedom; includes education * Gini	1,318,793
Model 3 excludes education * freedom; includes education * culture	1,318,910

substantially influence tolerance for homosexuality. In order of tolerance (high to low), the ranking of culture zones is Western Europe/North America; Catholic/ Latin America; Hindu/South Asia; sub-Saharan Africa; Confucian/East and Southeast Asia; Orthodox/Eastern Europe and Russia; and Islamic/Middle East and North Africa.

As a further test, we determined whether model 3 is the best fit among competing interaction models. Specifically, we took as our baseline the BIC for model 3, which includes the interaction between educational attainment and political freedom. We then compared BIC for our baseline model with the BICs for three models that *exclude* the interaction between educational attainment and political freedom but include each of the other contextual variables, one by one. The BIC statistics in Table III support the view that model 3 is a better model than any of the other interaction models.

As noted earlier, we tested the robustness of model 3 with an alternative dependent variable concerning respondent's tolerance of having homosexual neighbors. The alternative question allows only a binary response, precluding findings on varying degrees of tolerance. Moreover, unlike our preferred dependent variable, the alternative variable is not available for all survey waves and has more missing cases. Nonetheless, the results of our hierarchical logistic regression models yield similar patterns regardless of which dependent variable we use. For example, the effect plot of the regression model using the alternative dependent variable is similar to the effect plot using our preferred dependent variable (see Fig. 3). The regression table using the alternative dependent variable is available from the authors on request.[5]

DISCUSSION AND CONCLUSION

This study examines the role of education in value liberalization, especially regarding tolerance of sexual minorities. It challenges the assumption that education always contributes positively to tolerance, arguing that the assumption has been perpetuated by focusing on biased samples of societies. By including countries with different levels of political freedom in our sample, we found that political freedom moderates the way education works. Specifically, political freedom contributes

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[5] The prompting of one reviewer led us to determine whether importance of religion (available for waves 2–6) and belief in God (available for waves 1–6) at both the individual and aggregate levels affected our results. We found that these additions strengthened our main findings but also reduced the number of cases by 40% due to missing data. Detailed findings from this test are available from the authors on request.
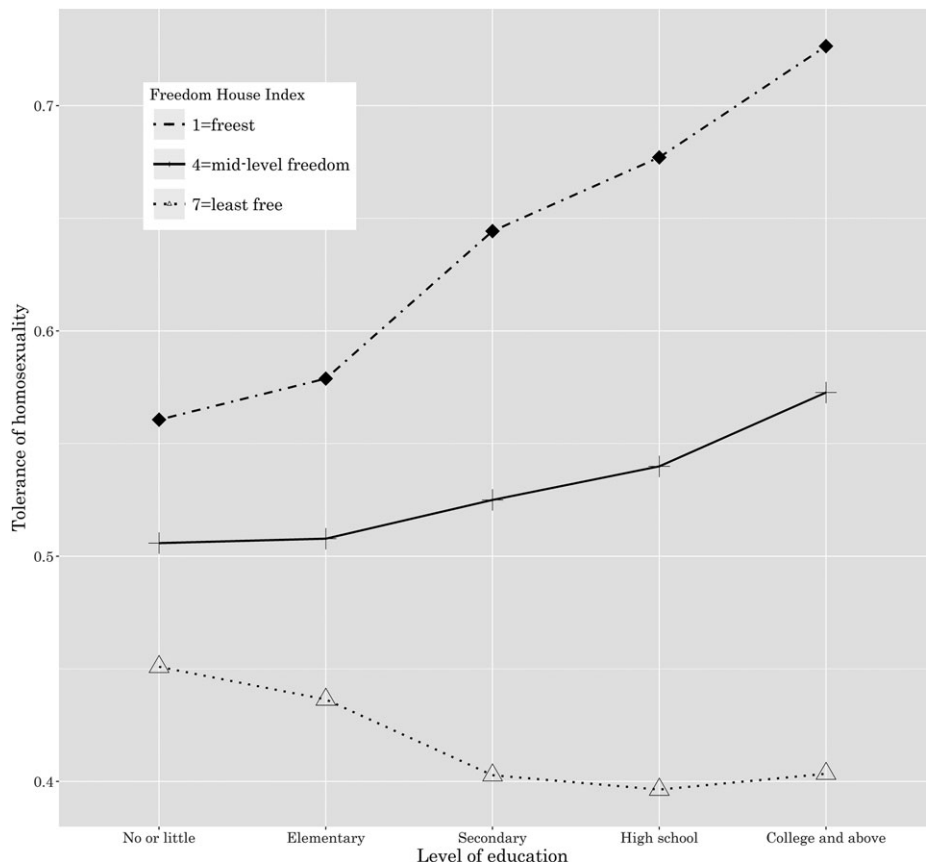
Fig. 3. The Interaction Effect of Political Freedom and Education on Tolerance of Homosexual Neighbors. The y-axis represents the likelihood of tolerance, ranging from 0 (intolerant) to 1 (tolerant).

to tolerance; a high level of political freedom increases the effect of education on tolerance while a low level decreases the effect; and the effect of political freedom does not diminish after controlling for economic and cultural context. Freedom unleashes the full force of education's liberalizing effect.

The present study suggests the need to qualify extant theories of value change, particularly modernization theory and cultural theory. The first idea requiring qualification is the notion that contexts tend to influence all people similarly. By examining the effect of political freedom on the relationship between educational attainment and tolerance, we demonstrated that the effects of economic context and cultural context are not the same everywhere. We were unable to replicate the finding of other studies that social inequality moderates the effect of GDP per capita on tolerance, perhaps because the other studies sampled a smaller number of less heterogeneous societies (Andersen and Fetner 2008; Milligan et al. 2014). However, we did find that a society's level of political freedom moderates the effect of GDP

per capita and culture on tolerance. At least in the case of tolerance of homosexuality, education matters more in free societies, and it matters most for highly educated people in free societies. This finding implies that, in general, researchers need to pay more attention to the way in which contextual (and individual-level) variables modify the effects of predictors on values.

Our findings also suggest the need to question the idea that affluence and education universally foster more tolerant and liberal attitudes (Inglehart and Baker 2000; Welzel and Inglehart 2005). Repeated findings in support of this idea could be an artifact of researchers focusing their attention mainly on affluent, democratic, Western societies from the 1950s to the 1990s. Nevertheless, consisted with this finding, many Western scholars and political observers argue that simply by getting unfree societies to join the globalization and modernization process, liberalization will follow (Fukuyama 2006). They thereby ignore a critical issue: tolerance in particular and liberalism, in general, do not spring spontaneously from economic development. They require hard political work. In unfree societies—even moderately wealthy and rapidly developing unfree societies with large and expanding middle classes—ruling forces energetically seek to weaken liberal ideas. We believe that democratization is a prerequisite of liberalism that operates somewhat independently of economic development and high educational attainment.

The present paper has some limitations. The WVS is a cross-time, cross-sectional survey, not a panel study. It is therefore difficult to argue for causal relationships among variables. Legitimate concerns may be raised about the causal direction of the proposed mechanisms. After all, as previous scholars have argued (and we acknowledged), liberal individuals, liberal education systems, and liberal regimes influence each other (Frank and Meyer 2002; Meyer et al. 2007; Robinson 2011). In this article, we propose a top-down causal mechanism from regime policy to the education system and then to individuals. But a bottom-up mechanism is also plausible, according to which liberal citizens establish a democratic government and demand a more liberal education system (Gibson 1992; Kane 2003). In other words, we found an association and proposed a causal mechanism but acknowledge that the causal mechanism we identify may be spurious in some cases.

Future research needs to examine this matter with better data. Here, we can defend our approach only as follows. First, although panel data are increasingly available, they are typically collected in a single society or a few geographically adjacent societies that have similar economic, cultural, and political contexts. Such samples do not contain enough information for comparative analysis seeking to discover contextual effects. If in the future scholars are equipped with panel data covering many heterogeneous societies, they will be able to address the causality issue in a way we cannot.

Our second defense is based on historical observations supporting the idea that a top-down causal mechanism predominates in some cases. In the twentieth century, military conflicts, invasions, and occupations caused some countries to be split into politically distinct parts. Cases include the splits between Taiwan and mainland China, North Korea and South Korea, East and West Germany, and North and South Vietnam. These instances of fragmentation constitute natural experiments that cast light on the problem of endogeneity. Prior to political division, the parts of

each pair were similar in their economic, cultural, and political environments. After political division, once-similar individuals embarked on different paths because they lived on different sides of a border. Thus, China arrests feminists and LGBTQ activists (Zheng 2015), while the supreme court of Taiwan has ruled in favor of same-sex marriage (Cheng, Wu, and Adamczyk 2016; Guardian 2017). North Korea runs a police state that ensures conformity if not loyalty to the Kim family and its so-called socialist regime, while the South Korean state created conditions that allowed citizens to initiate a movement that helped to depose corrupt president Park Geun-Hye and see her sentenced to 24 years in jail (Guardian 2018; Shin and Moon 2017). These cases illustrate the existence of a top-down mechanism in which different regimes channel once-similar people into different political environments with evident consequences for their values and their actions. We do not wish to imply that top-down causality predominates everywhere and at all times. However, it appears to predominate in the cases that attracted our attention and that motivated this article.

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