

# The growing evolution of acceptance of homosexuality in the United States from 1982 to 2017.

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**Abstract:** Motivated by the study of the social changes that shape the world today, this dossier analyses the increased acceptance of homosexuality in the United States from 1982 to 2017 based on individual characteristics. By means of a precise choice of personal characteristics which are religion, sex, age, political opinion and level of education, we will use an ordered probit econometric model to estimate the probability to accept homosexuality on the basis of it. As our results are almost all significant, this reveals a considerable importance of these personal criteria on the increasing evolution of the acceptance of homosexuality in the United States over our study period (1982 to 2017). This study therefore makes it possible to identify that it is essential to take into account personal factors in order to understand the changes of societies and consequently of our world.

**Keywords:** Acceptation of homosexuality, Ordonned Probit, Marginal effects.

## Introduction

Homosexuality has been a prohibited subject for centuries and its acceptance was unthinkable. Over time, significant events such as wars, economic crises... have changed the face of the world, which has allowed minorities to be heard and to evolve the openness people's mind. In the United States, as in many countries, the cultural apprehension of homosexuality changes from the current statue of history: first it is a sin, then a crime, then a disease until it is considered as a natural fact. History shows that it is in the United States that the transition to the acceptance of homosexuality took place first. In this country, until the 20th century, people who were not heterosexual could follow their sexual orientation only in secret because of social contempt, discrimination and threats of lawsuits. The emancipation of homosexuals begins in the aftermath of the Second World War, with studies of *male sexual behaviour* (*Sexual Behavior in the Human Male*, 1948, reissued in 1998) and *female sexual behaviour* (*Sexual Behavior in the Human Female*, 1953, republished 1998) by Alfred Kinsey. This was followed by the founding of the Mattachine Society (1950) and the subsequent participation of gay activists in the African-American Civil Rights Movement (1955-1968), prior to the Stonewall Riots (1969). The result is the founding of combat organizations, including the Gay Liberation Front, and the elimination of homosexuality from the American Psychiatric Association's Catalogue of Diseases (DSM) in 1973. All these facts are important milestones in the evolution of the recognition of gay rights in the United States. Then, from 1981, the reorientation of the homosexual movement during the HIV crisis, the incorporation of minorities such as transgender people since the 1990s, are relatively recent significant events that have contributed to the growth in the acceptance of homosexuality in the United States. However, because of the federal structure of the United States, each state with its own criminal laws, the decriminalization of homosexual conduct occurs in a number of independent steps. Illinois was the first state to abolish its law against sexual perversions, including homosexuality, in 1962. Until 2003, the number of states where homosexuality is condemned is decreasing. Socio-cultural evolution follows by far the evolution of laws. The equality of homosexuals is part of the general liberation of sexuality from cultural traditions, which lose importance in the 20th century and disappear before the concept of sexual autonomy. As a result, homosexuals have continued their struggle to further increase their acceptance in American society, which has borne fruit since, in 2015, the Supreme Court of the United States accepts same-sex marriage; and in 2020 Richard Grenell becomes the first member of the openly homosexual presidential cabinet. All of these significant developments that have led to increased acceptance of homosexuality in the United States have happened very quickly, which has led us to ask:

"What are the individual characteristics that have accompanied the increasing evolution of the acceptance of homosexuality over time? "

In the first part we will present the data used to answer this question and some descriptive statistics. In a second part we will develop our empirical approach: the method of the ordered probit. In a third part we will discuss the results; the last part concludes the study.

### **1. Data and Descriptive statistics.**

#### ***1.1 Measuring the evolution acceptance of homosexuality and these factors in the United States from 1982 to 2017.***

In our study we are interested in the evolution of the acceptance of homosexuality. To do so, we used variables from the World Values Survey database.

This database was built as a search tool, it contains 290 questions distributed in 14 thematic-sections allowing to measure cultural values, attitudes and beliefs towards gender, family, religion, and experience of poverty, education, health, security, social tolerance and trust, attitudes towards multilateral institutions, cultural differences and similarities between regions and societies in 81 countries from 1980 to 2020.

The persons selected for the survey were randomly selected on the basis of a stratified, multi-stratum sample, at the territorial level, of the population aged 18 and over representative of the national population as a whole.

So, to measure the acceptance of homosexuality in the United States we have chosen as variable of interest “Justifiable: Homosexuality”, we will name this variable *justif\_homo* and which it is defined as follows:

$$y_i = \begin{cases} 0 & \text{means that no homosexuality acceptance} \\ [1,9] & \text{reflects the intermediate degrees of acceptance} \\ 10 & \text{is the maximum level of acceptance} \end{cases}$$

In order to estimate the evolution of our variable of interest from 1982 to 2017, we took into account a variable that summarizes all years concerned by the survey and named it *year\_survey*.

Accept homosexuality is a very personal decision, each person could be in favor of homosexuality or not. Even if, nowadays some people disagree that men or women like each other, the trend towards acceptance is growing. This is the reason that motivated us to choose personal characteristics that could affect our variable of interest.

First of all, we selected the year of birth which refers to the age of the interviewees. Over time, society changes because of certain events or shocks (wars, demonstrations...). Our study period (1982 to 2017) implies that Americans who responded to the surveys were very different ages, did not receive the same education, have not experienced the same events and therefore may have very different opinions regarding their own worldview and homosexuality. We named this variable *year\_birth*.

Second, we chose a variable that represents political opinion. "The left" represents the popular class, this party is rather reformist defending the less fortunate, seeking dialogue and compromise (with trade unions, associations...). "The Right" represents rich people with conservative ideas defending the cult of chief and order. Political opinion thus drives people opinion. This is why we decided to include this variable to explain the evolution of our dependent variable. We named this variable *political\_scale*.

**Table 1: Statistics on numeric variables**

	<b>Obs</b>	<b>Mean</b>	<b>Std.Dev.</b>	<b>Min</b>	<b>Max</b>
<b><i>justif_homo</i></b>	11137	4.54	3.43	1	10
<b><i>year_survey</i></b>	11137	2001.23	12.77	1982	2017
<b><i>year_birth</i></b>	11137	1956.19	20.84	1889	1999
<b><i>political_scale</i></b>	11137	5.67	2.12	1	10

Third, we chose the gender since S. Tissot (*Gayfriendly. Acceptation et contrôle de l'homosexualité à Paris et à New York, Paris, Raisons d'agir*, 2018) has shown that women accepted homosexuality more than men, suggesting that women are more open-minded than men and are less embarrassed regarding friend relationship with homosexual people. S. Tissot (2018) called this finding “gayfriendliness”. Results on men opinion are much

contrasted. Indeed, the author showed that homosexuality acceptance from men only slightly improved. We named this variable *sex*: this variable is set to 1 if the individual is a woman 0 otherwise.

**Table 2: Statistics on sex variable**

	<i>Population</i>	<i>Percentage</i>
<i>Male</i>	5 523	49.59%
<i>Female</i>	5 614	50.41%

Fourth, we chose the religion since believing and/or practicing a religion implies believing in certain opinions and applying certain principles. Belonging to a religion has a strong influence on personal behaviour and decisions, as well as on the worldview of each believer, as religion a very specific opinion of homosexuality. So like political opinion, the religion conditions the opinion of people, it was therefore important to take this variable into account to explain the evolution of acceptance of homosexuality in the United States. We named this variable *religion*.

**Table 3: Statistics on religion variable**

	<i>Population</i>	<i>Percentage</i>
<i>A religious person</i>	8 146	73.14 %
<i>Not a religious person</i>	2 551	22.91%
<i>A convinced atheist</i>	440	3.95 %

And finally, we choose a variable reflecting education. We defined this variable according to the age at which an American completed these studies: before 16, between 16 and 19, or after 19. We choose this specification since the more a person studies, the more he is educated on different subjects which allows him to refine his critical mind, to evolve his open-mindedness... Which changes his view of the world. This would induce that the more a person studies the more he sees the world differently and suggests that education could influence the judgment of an American on the issue of the acceptance of homosexuality. We named this variable *education*.

**Table 4: Statistics on education variable**

	<i>Population</i>	<i>Percentage</i>
<i>Before 16 year sold</i>	676	6.07 %
<i>Between 16 and 19 years old</i>	4,881	43.83 %
<i>After 19 years old</i>	5,580	50.10 %

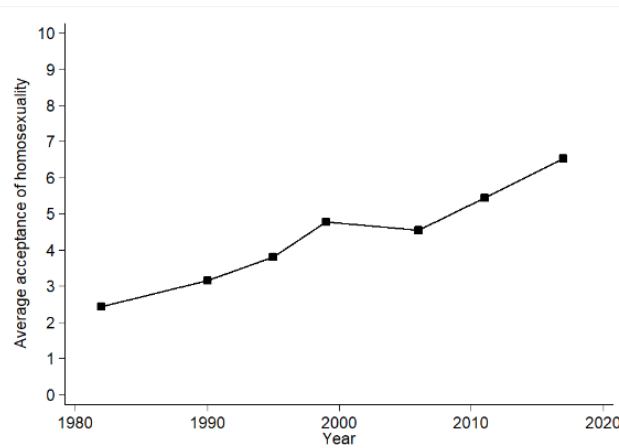
Our dataset is organized as a balanced panel dataset leading to 11397 observations which looks sufficient to assess without any small sample bias the effect of the chosen personal characteristics on the homosexuality acceptance in the United States from 1982 to 2017.

See appendix 1 that summaries correlations between our dependent variable and predictors. These correlations provide a first overview of the link between our explanatory variables and the variable of interest. This appendix 1 shows strong links between explanatory variables and our dependent variable suggesting that our specification identification looks good.

## 1.2 Descriptive statistics.

In this part we will present some explanatory variables to support the choice of these ones to explain the evolution of our dependent variable from 1982 to 2017 (the others are available in appendix 2 to 4).

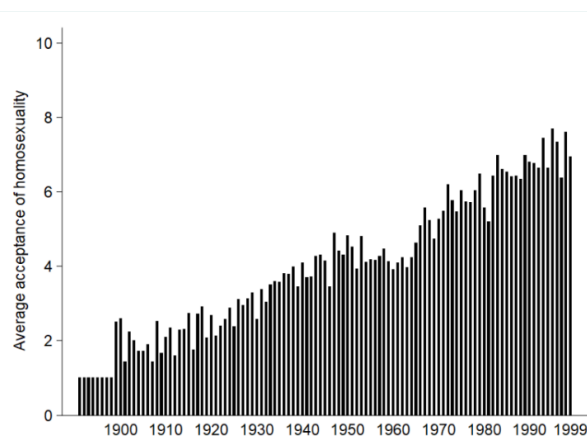
**Figure 1: Average homosexuality acceptance per year in USA**



Source: authors

This figure 1 shows the average evolution of acceptance of homosexuality over our study period (1982 to 2017). We can see that from 1982 to 2017 the curve only increases, although we can see a slight decrease from 2000 to 2006, in fact this period included in Bush mandate. He was against same-sex marriage, calling for an amendment to the US constitution. This graphic analysis suggests a growing trend of acceptance of homosexuality in the United States over our period (1982 to 2017) which motivated our study.

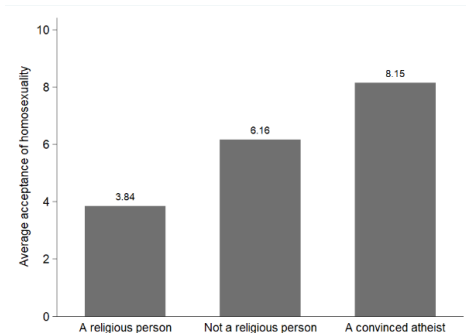
**Figure 2: Average homosexuality acceptance per year of birth**



Source: authors

The study of this graph suggests that according to the year of birth Americans have different views on the acceptance of homosexuality. Indeed, the youngest people (born in 1999) have a higher average than older people (born before 1900). So, we wanted to empirically test whether the year of birth may affect our dependent variable.

*Figure 3: Average homosexuality acceptance in USA by religion*



Source: authors

The analysis of this figure suggests that on average the more people are detached from any religion (tend to be atheist) the more they are in favor of accepting homosexuality. In view of these results, we have therefore chosen to empirically estimate the influence of religion on our variable of interest during our study period (1982 to 2017).

## 2. Methodology.

On the bottom of the individual data on the American population obtained in the WVS database, our objective is to study the individual characteristics that influenced the increase in the acceptability of homosexuality from 1982 to 2017.

First, the study of descriptive statistics in Section 2 allowed us to see religion, gender, year of birth (age), political opinion and level of education (which are our explanatory variables) have played a positive role in the acceptance of homosexuality (our dependent variable) in the United States.

In order to empirically test the hypothesis that the individual characteristics we have chosen increases the probability of homosexuality acceptance in the United States over our study period (1982 to 2017) we will use an ordered probit econometric model.

Ordered probit econometric models apply in the case of ordered and proprietary multinomial qualitative variables (Greene [2000]; Thomas [2000]). The latent model is similar to a binomial probit:

$$y_i^* = \beta x_i + \varepsilon_i$$

with  $x_i$  a vector of endogenous variables,  $\beta$  the vector of the parameters and  $\varepsilon_i$  the residual error which follows a normal distribution.

In the case of the ordered multinomial problem, we observed:

$$y_i = j \text{ si } c_j < y_i^* < c_{j+1}$$

where  $j = 0, 1, \dots, J$  represents the different modalities of the endogenous variable. The probabilities associated with these different modalities are calculated as follows:

$$Pr(y_i = j) = \Phi(c_{j+1} - \beta x_i) - \Phi(c_j - \beta x_i)$$

The interpretation of the results of this type of model cannot be done directly and we choose to calculate the marginal effects in order to make our results interpretable.

### 3. Results

#### 3.1 Main regression and Heterogeneous Effects

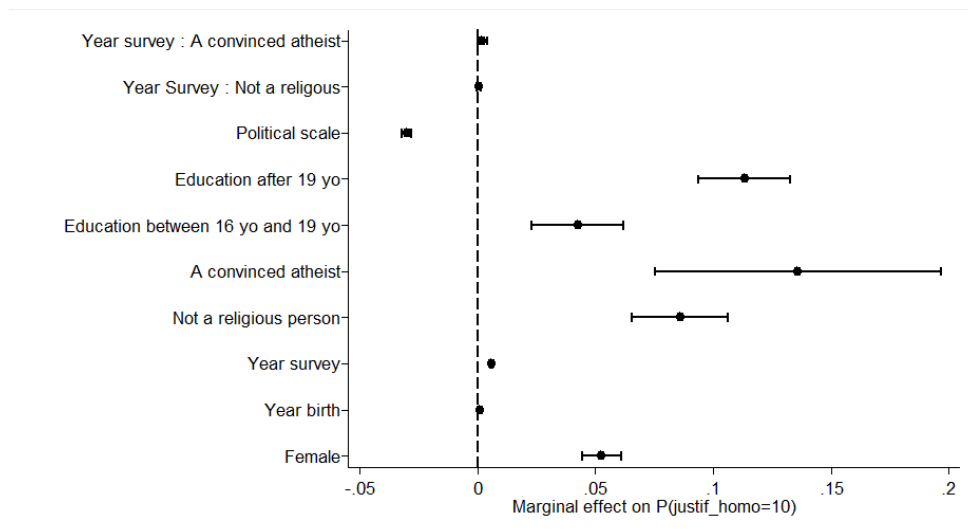
In addition to our variables, we decided to put an interaction between *year\_survey* and the religion in order to capt a difference, between religion, of the effect of time over the probability to accept homosexuality.

In the next table, we can see the result of our ordered probit model. A property of this type of model is that the coefficients are not directly interpretable, then we must have to consider the marginal effects of an event. To illustrate our result, we choose to propose the marginal effect of the probability that the individual answer “Always justifiable” to the question: that is when our dependent variable *justif\_homo* takes the value 10.

**Tableau 5: Ordered probit model results with Average Marginal Effect on  $P(\text{justif\_homo}=10)$**

Variable	Ordered probit model				Marginal effect on $P(\text{justif\_homo} = 10)$		
	Coef	Std.Err	T-stat	P.value	Marginal effect	T-stat	P.value
<i>female</i>	0.2757	0.0216	12.76	0.000	0.0527	12.7	0.000
<i>year_birth</i>	0.0049	0.0006	7.75	0.000	0.0009	7.73	0.000
<i>year_survey</i>	0.0309	0.0011	26.93	0.000	0.0059	25.53	0.000
<i>not_religious</i>	0.4495	0.0537	8.36	0.000	0.0859	8.26	0.000
<i>atheist_convicted</i>	0.7114	0.1618	4.4	0.000	0.136	4.38	0.000
<i>education_between_16_19</i>	0.222	0.0514	4.32	0.000	0.0424	4.3	0.000
<i>education_after_19</i>	0.5926	0.0511	11.59	0.000	0.1133	11.47	0.000
<i>political_scale</i>	-0.1568	0.0054	-29.11	0.000	-0.03	-28.77	0.000
<i>year_survey</i> × <i>not_religious</i>	0.0028	0.002	1.39	0.166	0.0005	1.39	0.164
<i>year_survey</i> × <i>atheist_convicted</i>	0.0107	0.0054	1.98	0.048	0.002	1.98	0.047

**Figure 4: Average marginal effects on  $P(\text{justif\_homo}=10)$**



As we can see, most of our coefficient are significantly different from zero at 95% level, except the coefficient that absorbs the effect of *year\_survey* over the homosexuality acceptance for people who are not religious, compared to those who are religious. However, the effect of the year on the probability to totally accept homosexuality is significantly greater if the individual is a convinced atheist compared to if the individual is a religious person. That means that over time, everybody accepts more and more homosexuality, but this increase is higher for convinced atheist individual. On average, for a religious person, the probability to totally accept homosexuality increases by about 0.59% each year while this increase is about 0.79% ( $0.59 + 0.2$ ) for a convinced atheist person. The principal result is that whatever the person is a religious person or not, the effect of time on the probability to totally accept homosexuality is always positive and significant at 95% level.

In addition, the religious status also impact significantly the probability to accept entirely the homosexuality: not being a religious person increases by on average more than 8.6% this probability compared to being a religious person while being a convinced atheist increases it by more than 13% compared to being a religious person: these estimations are significantly different from zero at 95% level. Otherwise, the gap of homosexuality acceptance between male and female is significant at 95% level and estimated by an increase of 5.3% on the probability to accept entirely the homosexuality if the individual is a female.

As we planned, the year of birth of an individual impacts significantly the probability, for him, to accept homosexuality. An increase of one unit of the year birth raises the probability to answer “Always justifiable” by about 0.1%, that means, for example, that people who were born in 1990 have about 8% more chance to totally accept the homosexuality than people who were born in 1900, other things being equal.

Finally, the education and the political position of an individual impact significantly our dependent variable: being a “Right” political person decreases significantly the homosexuality acceptance compared to being a “Left” one, at 95% level. Moreover, a person who completes his education between 16 years old and 19 years old has on average 4.2% more chance to answer “Always justifiable” while a person who complete his education after 19 years old has 11% more chance, on average.

Remark: As you can see in the Appendix 5, we test for the multicollinearity problem and we conclude that there is no such problem. We would have a problem if one of the Variance Influence Factor were higher for an independent variable were higher than 4. We notice that for the dummy’s variable, this condition is not validated but it is not a problem because by construction, there are dependent from each other.

### **3.2 Robustness.**

In order to check if the significance of our estimated parameters is not due to the hazard, we test the robustness of our results. Thus, a way to do this is to re-estimate our coefficients over another representative sample and then, because we were concentrated only on the United States, we will now focus on other similar countries, which are Canada and Australia, that have some likeness such that the level of wealth or the culture.



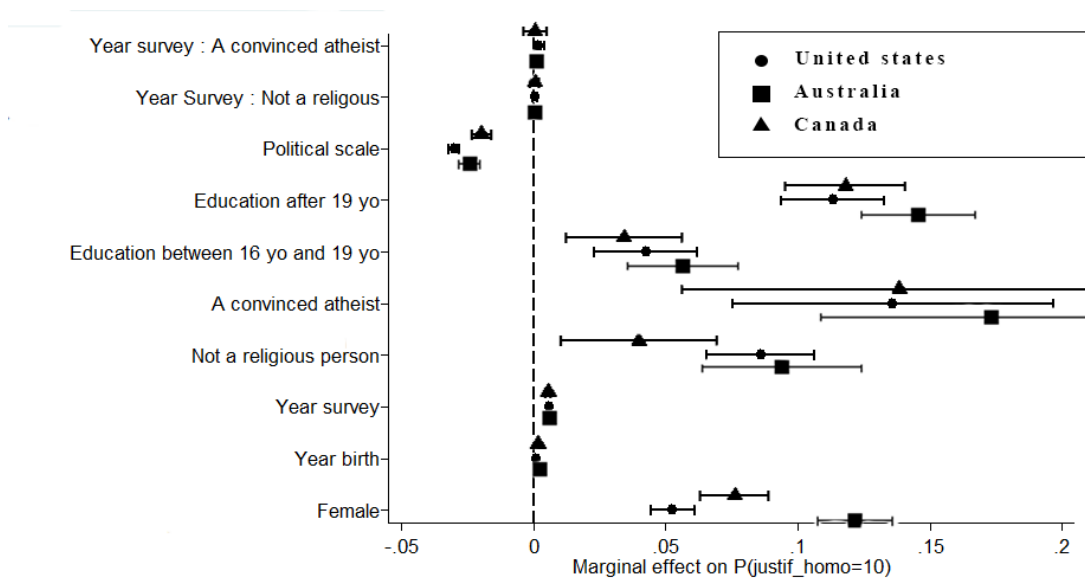
*Table 6: Marginal effects on  $P(\text{justif\_homo} = 10)$  for different countries*

	USA		CANADA		AUSTRALIA	
Variable	Marginal effect	P.value	Marginal effect	P.value	Marginal effect	P.value
<i>female</i>	0.0527	0	0.0764	0	0.1218	0
<i>year_birth</i>	0.0009	0	0.0019	0	0.0027	0
<i>year_survey</i>	0.0059	0	0.0058	0	0.0061	0
<i>not_religious</i>	0.0859	0	0.0401	0.008	0.094	0
<i>atheist_convicted</i>	0.136	0	0.1386	0.001	0.1735	0
<i>education_between_16_19</i>	0.0424	0	0.0344	0.002	0.0565	0
<i>education_after_19</i>	0.1133	0	0.1184	0	0.1457	0
<i>political_scale</i>	-0.03	0	-0.0195	0	-0.024	0
<i>year_survey</i> × <i>not_religious</i>	0.0005	0.166	0.0007	0.403	0.0006	0.337
<i>year_survey</i> × <i>atheist_convicted</i>	0.002	0.048	0.0008	0.698	0.0016	0.164

According to this table, all the significant estimated coefficients keep the same sign across these countries, which is an argument in favor of the robustness. On top of that, some of these coefficients are remarkably similar: this is the case of the effect of year over the probability to feel that homosexuality is fully acceptable, where we have for each country an increase, on average, by about 0.6% of this probability each year.

The next graph allows us to illustrate these similarities, we can see that all the estimated coefficients are slightly similar across countries.

*Figure 8: Average marginal effects on  $P(\text{justif\_homo}=10)$*



Source: authors

Even if our model seems to be robust, we notice that there could be some significant differences in terms of effect on the dependent variable across countries. This is the case for example, of the coefficient female for which the estimated impact over the probability to totally accept the homosexuality is twice as large in Australia than in the United States. These possible differences arouse our curiosity, and it leads us to re-estimate the model for different countries and then to make some difference in interpretation across countries. The interest is to compare countries that are different in term of development or culture for example. To see these results, I invite you to see the Appendix 6 where we can compare the United States, Japan, Australia, and South Africa. Be careful, these countries did not receive the survey the same year and if we do not take this aspect into account, it could bias your interpretations, then we can see in Appendix 7 the survey time series overview for these different countries.

### ***3.3 Endogeneity problem.***

The endogeneity problem appears when at least one explanatory variable of our model is correlated with the error term, for example if an omitted variable has an impact on the dependent variable only through an explanatory variable. This issue leads to bias our estimated coefficients.

In the specification of our model, we could expect an endogeneity problem with the variable education. The reasoning is that we think that an omitted variable could be the place where the individual lives. Indeed, if an individual lives in a place where 100% of people does not accept homosexuality, it is likely that this individual will think the same thing as his neighbors, by conformism and social reproduction. Thereby, since the level of education impacts the place where the individual lives, we think that there is an endogeneity problem with the variable education.

If this is true, then we expect that the coefficient estimated of the education is overestimated in our model compared to his real value.

## ***4. Conclusion.***

The main result of our study is the one that concerns the effect of year on the homosexuality acceptance. Our model has shown a clear increase in the acceptance of homosexuality over the period 1982 – 2017 in the United States, this leads us to interpret that people are more and more open-minded over time with an average increase by on average more than 0.6% per year of people who answer that homosexuality is always justifiable over the period (1987-2017).

Moreover, the model has shown that religion is an important variable to explain the reason why people answer that homosexuality is acceptable or not with an increase about 14% in the probability to totally accept homosexuality if you are a convinced atheist compared to being a religious person.

As we expected, females are more open-minded than male about homosexuality acceptance and our model has managed to capture this effect. Indeed, a female has on average a 5% more chance to answer, “Always justifiable” and this could be interpreted by the fact that women are conditioned by the society (parents, school, social networks) to be more open-minded than male.

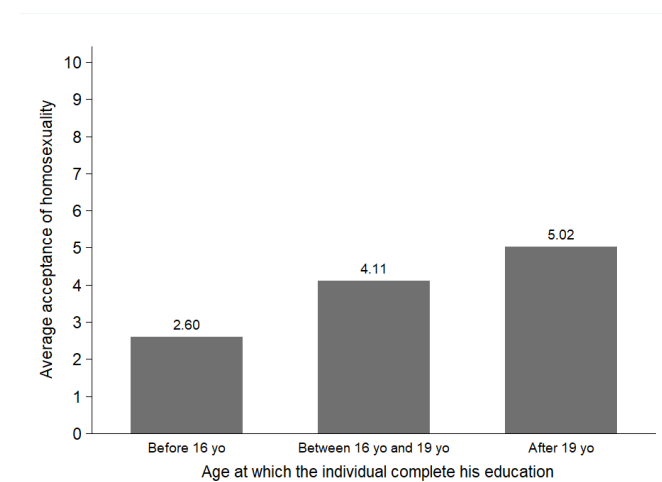
Our model has also managed to capture the expected effect of the level of education and the political scale on the homosexuality acceptance. The more educate you are, the more open-minded you are, and this is a result found by other studies over other sociological subjects. Furthermore, people who are from the “Right” in the political scale accept less the homosexuality than people from the “Left”: we interpret it by the fact that “Right” people are described to be more conservative and then, have more difficulty to accept the change in our society.

## Appendix

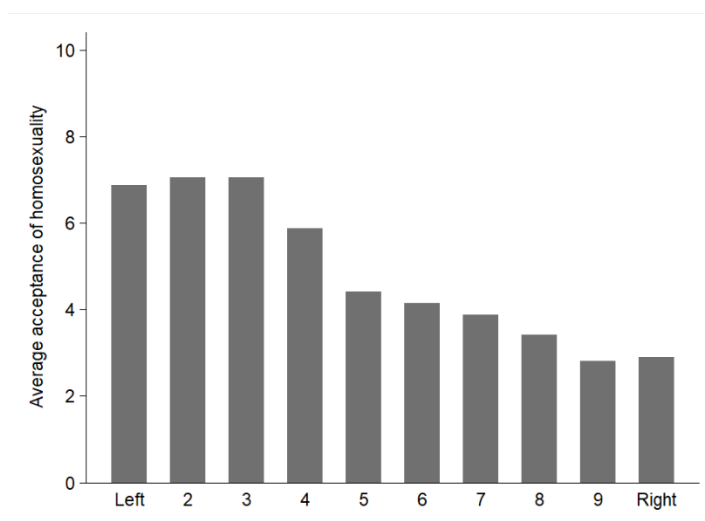
**Appendix 1: Spearman correlation matrix**

	<i>Justif_homo</i>	<i>year_birth</i>	<i>year_survey</i>	<i>Political_scale</i>
<i>Justif_homo</i>	1			
<i>year_birth</i>	0.33	1		
<i>year_survey</i>	0.42	0.54	1	
<i>political_scale</i>	-0.32	-0.14	-0.1	1

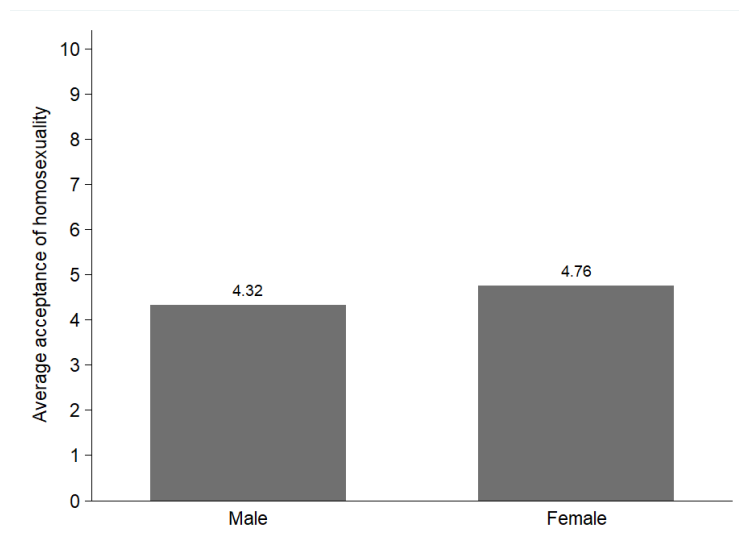
**Appendix 2: Average acceptance of homosexuality by level of education**



**Appendix 3: Average acceptance of homosexuality by political scale**



#### Appendix 4: Average acceptance of homosexuality by sex



#### Appendix 5: Variance Inflation Factors (VIF)

Variable	VIF
<i>year_survey</i> × <i>atheist_convinced</i>	9.55
<i>atheist_convinced</i>	9.35
<i>year_survey</i> × <i>not_religious</i>	5.23
<i>education_after_19</i>	4.9
<i>education_between_16_19</i>	4.83
<i>not_religious</i>	4.58
<i>year_survey</i>	1.83
<i>year_birth</i>	1.52
<i>political_scale</i>	1.07
<i>female</i>	1.02

*Appendix 6: Average marginal effect on P(justif\_homo=10) for different countries*

<i>Coef</i> [interv. 95%]	<i>Japan</i>	<i>United States</i>	<i>Australia</i>	<i>South Africa</i>
<i>female</i>	0.0462 *** [0.037; 0.055]	0.0527 *** [0.045; 0.061]	<b>0.1218 ***</b> <b>[0.107; 0.136]</b>	0.0097 *** [0.006; 0.013]
<i>year_birth</i>	<b>0.004 ***</b> <b>[0.004; 0.004]</b>	0.0009 *** [0.001; 0.001]	0.0027 *** [0.002; 0.003]	0.0003 *** [0; 0]
<i>year_survey</i>	0.0038 *** [0.003; 0.005]	0.0059 *** [0.005; 0.006]	0.0061 *** [0.005; 0.007]	0.0033 *** [0.003; 0.004]
<i>not_religious</i>	0.0062 [−0.017; 0.03]	0.0859 *** [0.066; 0.106]	0.094 *** [0.064; 0.124]	0.0441 *** [0.029; 0.059]
<i>atheist_convicted</i>	0.0118 [−0.021; 0.044]	0.136 *** [0.075; 0.197]	<b>0.1735 ***</b> <b>[0.109; 0.238]</b>	−0.0262 [−0.064; 0.011]
<i>education_between_16_19</i>	−0.0023 [−0.018; 0.013]	0.0424 *** [0.023; 0.062]	0.0565 *** [0.036; 0.077]	0.0058 [0; 0.012]
<i>education_after_19</i>	0.0183 * [0.002; 0.034]	0.1133 *** [0.094; 0.133]	0.1457 *** [0.124; 0.167]	0.0125 *** [0.006; 0.019]
<i>political_scale</i>	−0.0103 *** [−0.013; −0.008]	<b>−0.03 ***</b> <b>[−0.032; −0.028]</b>	−0.024 *** [−0.028; −0.02]	<b>0.0008 *</b> <b>[0; 0.002]</b>
<i>year_survey</i> × <i>not_religious</i>	0.0003 [−0.001; 0.001]	0.0005 [0; 0.001]	0.0006 [−0.001; 0.002]	<b>−0.0013 ***</b> <b>[−0.002; −0.001]</b>
<i>year_survey</i> × <i>atheist_convicted</i>	0.0007 [−0.001; 0.002]	0.002 * [0; 0.004]	0.0016 [−0.001; 0.004]	0.003 *** [0.001; 0.005]

Notation: Significant at \*(95%), \*\*\*(99%), \*\*\*(99.9%)

*Appendix 7: Survey time series overview*

	<i>Number of observations</i>	<i>Wave 1</i>	<i>Wave 2</i>	<i>Wave 3</i>	<i>Wave 4</i>	<i>Wave 5</i>	<i>Wave 6</i>	<i>Wave 7</i>
<i>United States</i>	10938	1982	1990	1995	1999	2006	2011	2017
<i>South Africa</i>	10961		1990	1996	2001	2006	2013	
<i>Australia</i>	6503	1981		1995		2005	2012	2018
<i>Japan</i>	4960	1981	1990	1995	2000	2005	2010	2019