DIFFERENCES IN TOLERANCE OF HOMOSEXUALITY: ATTITUDINAL CHANGE IN SPAIN AND THE UNITED STATES, 1999-2012

Reasoning, Data Analysis, & Writing Final Project — Data Analysis

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Abstract

Using data from the World Values Surveys, we explore trends in tolerance of homosexuality in Spain and the United States from 1999 to 2012. Particular attention is given to the effects of birth cohort. Consistent with previous research, we find that younger cohorts are typically the most tolerant of homosexuality. We also find that Spaniars are more liberal than Americans. Most interesting, however, is the remarkable degree of change over time within cohorts, especially in Spain. We speculate that differing political climate across country and time is responsible for the significant differences in public opinion.

Introduction

In this report we will try to find answers to the subject that interests us about which are the sectors of society more tolerant towards homosexuality.

It is widely believed that long-term changes in public opinion largely reflect generational effects. A related argument is that people change their minds little as they age. This hypothesis has been supported with respect to many social attitudes, but with the increased visibility of lesbian and gay people in the media, the expansion of lesbian and gay subcultures, and contested politics over lesbian and gay rights we might expect attitudes toward homosexuality during this period to be an exception to this rule. See [4].

Using data from the World Values Surveys (WVS)[1,2,3], the present study explores changes in attitudes toward homosexuality in Spain and the United States from 1999 to 2012 corresponding to waves 4, 5 and 6 of the aforementioned surveys. We build on previous research [4] from which we extracted and used the same methodology but for different periods and countries, exploring changes in the effects of birth cohort on attitudes in the two countries.

Data

This report is a cross sectional observational study therefore if we arrive to conclusions we should consider they can be generalized -but neve being causals- and only to the populations of Spain and United States, separated.

We employ a subset of the WVS[1,2,3], which include data from more than 40 countries and the cases correspond to respondents aged 18 or more and randomly selected. We focus only on Spain and the United States, using data collected at three points in time during the period 1999-2012. The data for Spain were collected in 1999 (N = 1,209), 2006 (N = 1,200) and 2013 (N = 1,189) . The data were collected by Análisis Sociológicos, Económicos y Políticos, S.A. (ASEP) and SPAIN (EVS) - Data SA (Madrid). The U.S. data were collected by Institute for Social

Research, University of Michigan in 1999 (N = 1,200), 2006 (N = 1,249) and 2013 (N = 2,232) . All of the data are from stratified random samples designed to be representative of the national adult (18 years and older) populations. To ensure that all birth cohorts are comparable across the three waves of the study, we restrict our analysis to those who would have been eligible for selection in all three waves. After removing missing cases, the total analytical sample size is 8,159, of which 3,487 respondents are from Spain and 4,672 are from the United States.

	Wave 4		Wave 5		Wave 6		Working dataset	
Variable	**Name**	**Type**	**Name**	**Type**	**Name**	**Type**	**Name**	**Type**
Original								
	v208	Factor	V202	Factor	V203	Factor	TOLERANCE	integer
	v106	Factor	V55	Factor	V57	Factor	MARITAL	Factor
	v223	Factor	V235	Factor	V240	Factor	GENDER	Factor
	v184	Factor	V185	Factor	V144	Factor	RELIGION	Factor
	v226	Factor	V238	Factor	V248	Factor	EDUCATION	Factor
	v235	Factor	V252	Factor	V238	Factor	SOCIAL	Factor
	v241	Factor	V255	Factor	V253	Factor	COMMUNITY	Factor
	V242	Factor	V256	Factor	V254	Factor	ETHNIC	Factor
	v1	Factor	V1	Factor	V1	Factor	SURVEY	Factor
	v2	Factor	V2	Factor	V2	Factor	COUNTRY	Factor
	v224	integer	V236	Factor	V241	integer	BY	integer
New								
							BD	Factor
							AGE	integer
							YR	Factor

Table 1. Summary of the original variables from each wave and the final state of the same once clustered in a single data set.

The dependent variable is based on a questionnaire item that asked respondents to give their opinions on various social and political issues, including homosexuality. The question was worded as follows:

Please tell me for each of the following statements whether you think it can always be justified, never be justified, or something in between, using this card.

Homosexuality

Never justifiable=1, 2, 3, 4, 5, 6, 7, 8, 9, 10=Always justifiable

The main predictors of interest are country (COUNTRY), year of the survey (SURVEY), and birth cohort (BD). Year is included in the statistical models as a three-category factor. Birth cohort is divided into six categories of roughly 10 years each: (1) born before 1939, (2) 1940-49, (3) 1950-59, (4) 1960-69, (5) 1970-79, and (6) After 1980. We also control for gender, education, social class, religion and marital status.

Exploratory data analysis

We start with figure 1. Three important points can be made from these graphs:

- The Spanish distributions shows more responses of 5-10 than in the United States especially for high values of the latest polls.

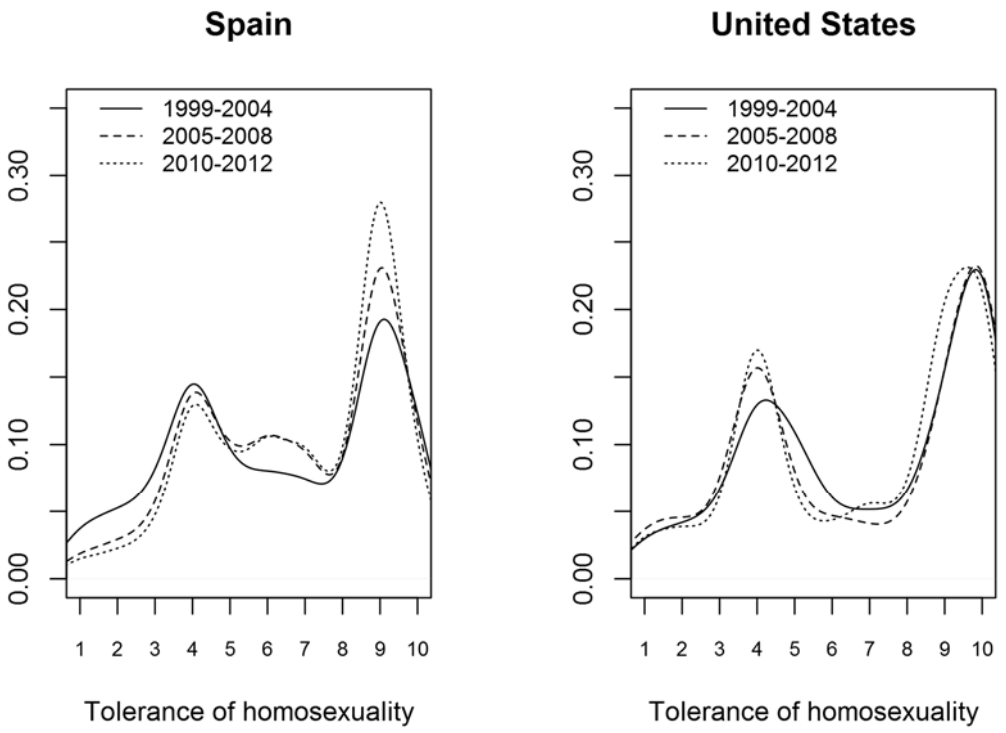

Figure 1. Panel with graphs of density estimates for the distribution of tolerance towards homosexuality by year and country. The lines in the graphs represent density estimates, which can be seen most simply as smoothed histograms. The dependent variable on a 10-point scale where 1 is equivalent to 'never justified' and 10 correspond to 'always justified'.

- For Spain the distributions show more high scores as time goes on.
- For United States the distributions are quite uniform, with roughly the same scores as time goes on
- For all surveys there is a peak in the middle of the scale, probably reflecting a large proportion of respondents who did not give the issue much thought.

The first two points suggest that Spaniards are generally more liberal than their American counterparts, and Spaniards attitude have become increasingly more liberal.

Table 2 explores the relationship between birth cohort and opinions that homosexuality is justifiable. Reported are the mean scores for each birth cohort by country, and over time. We see clear generational differences in terms of attitudes toward homosexuality in both countries, with the views of those in earlier cohorts tending to be less sympathetic to homosexuality than those in later cohorts.

Country	1999-2004 Age	1999-2004 mean†	2005-2008 Age	2005-2008 mean†	2010-2012 Age	2010-2012 mean†
Spain (Birth cohort)						
Before 1939	60+	3.57	66+	3.82	71+	4.05
1940-1949	50-64	3.32	56-68	3.41	61-72	3.41
1950-1959	40-54	3.28	46-58	3.21	51-62	3.12
1960-1969	30-44	3.39	36-48	3.26	41-52	3.16
1970-1979	20-34	4.27	26-38	3.45	31-42	3.3
After 1980	18-24	4.95	19-28	4.52	18-32	4.2
USA (Birth cohort)						
Before 1939	60+	3.4	66+	3.36	71+	3.48
1940-1949	50-64	2.79	56-68	2.91	61-72	3.11
1950-1959	40-54	3.03	46-58	3.05	51-62	2.98
1960-1969	30-44	3.19	36-48	3.24	41-52	2.95
1970-1979	20-34	3.96	26-38	3.4	31-42	3.11
After 1980	18-24	4.79	19-28	4.53	18-32	3.95

High scores indicate a greater tolerance towards homosexuality.
† Unweighted.

Table 2. Mean Responses to the Dependent Variable by Age —birth cohort— and Country.

Thus far our analysis has uncovered differences in attitudes according to country, year, and birth cohort. It is possible that these differences are less striking-or even disappear-after controlling for possible confounding variables. Growing levels of education, and declining proportions of people who belong to the working class, to a religion, or who are married, are all plausible explanations for country differences over time.

This already sheds some light on our question of interest.

Inference

This pooled data model provides formal tests for differences in the effects of birth cohort and time according to the country. After determining that there were, in fact, country differences worth exploring, we fitted separate models for Spain and the United States.

Let's try a model that allows us to determine which variables are significant and therefore help us better understand about social characteristics which give greater support to homosexuality.

We are going to use the following linear model to fit to the pooled data from both Spain and the United States, separately:

$$TOLERANCE \sim -1 + GENDER + RELIGION + EDUCATION + SOCIAL + MARITAL$$

And we will state the working hypotheses as follow:

$$H_0: beta_i = 0$$

$$H_A: beta_i \neq 0$$

We check that the amount of respondents, over a thousand for each group, are less than 10% of all American and Spaniards. Besides American respondents are chosen randomly and Spaniards are sampled randomly as well. Also there are not reason to expect sampled to be dependent. Therefore the Independence Condition is met.

Country	Estimate	t value	Pr(>|t|)		ci: 5%	ci: 95%
Spain						
GENDER: Female	6.81 (1.02)	6.68	0	***	5.13	8.49
GENDER: Male	6.66 (1.02)	6.52	0	***	4.98	8.33
RELIGION: Orthodox	3.83 (2.01)	1.91	0.06	•	0.53	7.13
EDUCATION: Complete secondary school: university-preparatory type	0.43 (0.17)	2.61	0.01	**	0.16	0.71
EDUCATION: Incomplete secondary school: university-preparatory type	0.32 (0.17)	1.83	0.07	•	0.03	0.6
EDUCATION: University - level education, with degree	0.78 (0.17)	4.57	0	***	0.5	1.06
SOCIAL: Upper middle class	-0.62 (0.29)	-2.12	0.03	*	-1.11	-0.14
SOCIAL: Working class	-0.52 (0.25)	-2.07	0.04	*	-0.94	-0.11
United States						
GENDER: Female	6.61 (0.67)	9.88	0	***	5.51	7.72
GENDER: Male	6.46 (0.67)	9.63	0	***	5.36	7.57
MARITAL: Living together as married	0.43 (0.23)	1.85	0.06	•	0.05	0.82
MARITAL: Married	0.34 (0.15)	2.26	0.02	*	0.09	0.59
MARITAL: Single	0.32 (0.17)	1.87	0.06	•	0.04	0.6

Standard errors are in parentheses.
•p-value < .1; *p-value < .05; **p-value < .01;***p-value < .001.

Table 3. Coefficients for the two Models predicting Tolerance of Homosexuality for each significant variable. Values from significant variables are represented while the rest of variable or levels without significance have been ignored. Spain and USA Treated Separately.

Table 3 displays coefficients for the separate models fitted to each country and the results show that: the probability of at least as extreme as the observed data given that $H_0: beta_i = 0$ is true, results lower than the significance level we stated of ***alpha = 0.1***. Also, the ***nullvalue = 0*** is out of the confidence interval calculated with a confidence level of ***90%***.

Also, the data provide convincing evidence that $betha_i$ coeficients are significantly different than ***0***, so the explanatory variables are significant predictors of the response variable . With a significance level of *alpha = 0.1* we reject $H_0: beta_i = 0$ favoring $H_A: beta_i \neq 0$. Also, we are ***90%*** confident that all $beta_i$ fall inside the indicated endpoints of their confidence interval.

The effects of the country, year, and birth cohort should be consistent with those uncovered in tables 1. To better see the effects of these variables, we turn to figure 2, which plots fitted values from the country-specific models showing the effects of birth cohort over time in both Spain and the United States. Several notable findings are evident in this figure.

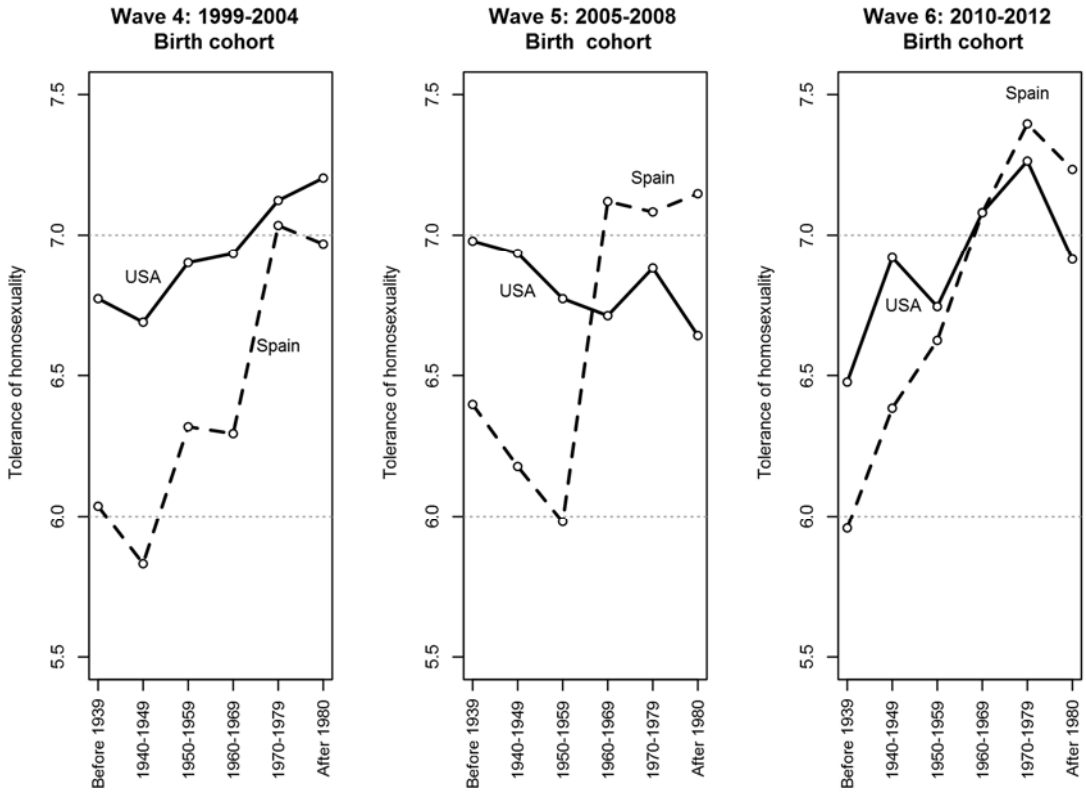

Figure 2. Panel with The Effect of Birth Cohort on Tolerance of Homosexuality, by survey wave and Country. Fitted Values are Based on Models for each Country Treated Separately.

First, if we look only at the effects for Spain, we notice that acceptance of homosexuality gradually increased from one year of the study to the next, specially in the latters cohorts. On the other hand, for the United States, there was a slight drop in wave 5 and then a rise again in wave 6. Finally, the changes within cohorts, and the differences across countries, suggest that some social forces could be responsible. More specifically, these results suggest that significant social change has occurred, and that this change has been most marked in Spain.

Conclusion

We have tried to find useful answers to the questions we have raised in order to use the findings as evidence for the future report and so to elucidate the debate raised in the initial phase of the *Reasoning, Data Analysis, & Writing Final Project.*

This study explored country differences in the effects of birth cohort on attitudes toward homosexuality over a 13-year period. By comparing Spain and the United States, we were able to assess how people from two otherwise quite similar countries may have been affected by different policies on homosexuality. Our findings confirm some previous results. We found that acceptance of homosexuality is more evident in Spain than in the United States, although public opinion became increasingly tolerant in both countries over the 13-year period under study. Also consistent with previous research, we found that acceptance of homosexuality is negatively related to age.

In general, the patterns of association with respect to the social background are as expected from previous research. More specifically, respondents who are male, have low education, are from lower social classes tend to express the least tolerant views about homosexuality.

lthough we used only cross-sectional data, and thus could not explicitly test how individual attitudes changed over time, our finding of significant increases in acceptance of

homosexuality within all cohorts is highly suggestive that individual attitudes did change. This finding, combined with the general increases in acceptance in both Spain and the United States, and the differences in change between the two countries, suggests that people responded to national debates on the homosexuality issue. We cannot be certain that policy affected attitudes rather than the other way around, but since most other social forces were similar in the two countries, the former is a logical conclusion.

Further study is needed. In particular, future research must go beyond the two-country comparison to include other nations, both those that are similar to and those that are different from Spain and the United States.

References

[1]Asep/JDS. WORLD VALUES SURVEY. *World Values Survey Association Wave 4*, OFFICIAL AGGREGATE v.20140429 (1999), Madrid–Spain.

[2]Asep/JDS. WORLD VALUES SURVEY. *World Values Survey Association Wave 5*, OFFICIAL AGGREGATE v.20140429 (2005), Madrid–Spain.

[3]Asep/JDS. WORLD VALUES SURVEY. *World Values Survey Association Wave 6*, OFFICIAL AGGREGATE v.20141107 (2010), Madrid–Spain.

[4]ROBERT ANDERSEN and TINA FETNER. COHORT DIFFERENCES IN TOLERANCE OF HOMOSEXUALITY: ATTITUDINAL CHANGE IN CANADA AND THE UNITED STATES, 1981–2000. *Public Opinion Quarterly Vol. 72*, 2 (2008), 311–330.

Appendix

One page of the working data set.

	BY	BD	TOLERANCE	MARITAL	GENDER	RELIGION	EDUCATION	SOCIAL	COMMUNITY	ETHNIC	SURVEY	COUNTRY
1	1906	1900-1909	NA	Widowed	Male	Roman Catholic	No formal education	Lower class	5,000-10,000	Coloured (light)	1999	Mexico
2	1910	1910-1919	10	Single	Female	Roman Catholic	Complete primary school	Lower middle class	2,000 and less	Caucasian White	1999	Spain
3	1911	1910-1919	9	Married	Female	None	Incomplete primary school	Lower middle class	2,000 and less	Coloured (light)	1999	Mexico
4	1912	1910-1919	8	Single	Male	None	Complete secondary school: technical/ vocational type	Lower middle class	<NA>	<NA>	2013	Spain
5	1913	1910-1919	10	Married	Female	Roman Catholic	Complete secondary school: university-preparatory type	Lower middle class	100,000-500,000	Caucasian White	1999	Spain
6	1914	1910-1919	10	Married	Male	Other	University - level education, with degree	Working class	100,000-500,000	Caucasian White	1999	United States
7	1915	1910-1919	NA	Widowed	Female	Roman Catholic	Incomplete primary school	Working class	100,000-500,000	Caucasian White	1999	Spain
8	1915	1910-1919	5	Married	Male	Roman Catholic	Incomplete secondary school: technical/ vocational type	Upper middle class	100,000-500,000	Coloured (light)	1999	Mexico
9	1915	1910-1919	9	Married	Female	Roman Catholic	No formal education	Working class	500,000 and more	Caucasian White	1999	Spain
10	1915	1910-1919	10	Married	Female	Roman Catholic	No formal education	Lower class	2,000 and less	Coloured (dark)	1999	Mexico
11	1915	1910-1919	10	Widowed	Male	Roman Catholic	Incomplete secondary school: university-preparatory type	<NA>	500,000 and more	Caucasian White	2006	United States
12	1915	1910-1919	10	Widowed	Male	Protestant	Complete primary school	Working class	500,000 and more	Caucasian White	2006	United States
13	1915	1910-1919	4	Widowed	Female	Roman Catholic	No formal education	Working class	5,000-10,000	Caucasian White	1999	Spain
14	1916	1910-1919	10	Widowed	Female	Roman Catholic	No formal education	Lower class	50,000-100,000	Other	1999	Mexico
15	1916	1910-1919	10	Married	Male	Roman Catholic	No formal education	Working class	500,000 and more	Caucasian White	1999	Spain
16	1916	1910-1919	10	Married	Male	Protestant	Incomplete secondary school: technical/ vocational type	Working class	100,000-500,000	Caucasian White	1999	United States
17	1916	1910-1919	10	Married	Male	Protestant	Complete secondary school: university-preparatory type	Working class	20,000-50,000	Caucasian White	2006	United States
18	1916	1910-1919	1	living together as married	Female	Roman Catholic	Complete primary school	Lower middle class	100,000-500,000	Caucasian White	1999	Spain
19	1916	1910-1919	10	Married	Male	Other	University - level education, with degree	Upper middle class	100,000-500,000	Caucasian White	1999	United States
20	1916	1910-1919	7	Married	Male	None	Complete primary school	Lower middle class	500,000 and more	Caucasian White	1999	Spain
21	1917	1910-1919	10	Widowed	Female	Roman Catholic	Complete primary school	Working class	10,000-20,000	Caucasian White	1999	Spain
22	1917	1910-1919	10	Single	Male	Roman Catholic	<NA>	Lower class	2,000 and less	Coloured (dark)	1999	Mexico
23	1917	1910-1919	3	Married	Male	None	No formal education	Working class	5,000-10,000	Caucasian White	1999	Spain
24	1917	1910-1919	NA	Married	Male	Roman Catholic	Incomplete primary school	Lower middle class	<NA>	<NA>	2006	Spain
25	1917	1910-1919	9	Married	Male	None	Incomplete primary school	Working class	100,000-500,000	Caucasian White	1999	Spain
26	1917	1910-1919	1	Widowed	Male	Roman Catholic	Incomplete primary school	Working class	100,000-500,000	Coloured (dark)	1999	Mexico
27	1917	1910-1919	NA	Married	Male	Jew	Complete secondary school: university-preparatory type	Upper class	20,000-50,000	Caucasian White	1999	United States
28	1917	1910-1919	9	Widowed	Female	Jew	Complete primary school	Lower middle class	20,000-50,000	Caucasian White	1999	United States
29	1917	1910-1919	10	Married	Female	Protestant	Incomplete secondary school: technical/ vocational type	Upper middle class	50,000-100,000	Caucasian White	1999	United States
30	1917	1910-1919	7	Widowed	Female	Roman Catholic	Complete primary school	Lower middle class	<NA>	<NA>	2006	Spain
31	1918	1910-1919	9	Married	Female	Roman Catholic	Incomplete primary school	Working class	5,000-10,000	Caucasian White	1999	Spain
32	1918	1910-1919	1	Widowed	Female	Roman Catholic	Complete primary school	Lower class	500,000 and more	Caucasian White	1999	Spain
33	1918	1910-1919	10	Married	Male	Roman Catholic	Complete primary school	Upper middle class	100,000-500,000	Caucasian White	1999	Spain
34	1918	1910-1919	10	Widowed	Male	None	Complete primary school	Lower middle class	2,000 and less	<NA>	1999	Spain
35	1918	1910-1919	4	Married	Male	None	No formal education	Lower middle class	500,000 and more	Caucasian White	1999	Spain
36	1918	1910-1919	10	Single	Female	Roman Catholic	University - level education, with degree	<NA>	50,000-100,000	Coloured (light)	2006	Mexico
37	1918	1910-1919	10	Widowed	Female	Roman Catholic	No formal education	Working class	<NA>	<NA>	2006	Spain
38	1918	1910-1919	10	Married	Male	None	Incomplete primary school	Working class	500,000 and more	Caucasian White	1999	Spain
39	1918	1910-1919	4	Married	Male	None	Complete secondary school: university-preparatory type	Lower middle class	50,000-100,000	Caucasian White	1999	Spain
40	1918	1910-1919	3	Widowed	Female	Roman Catholic	Incomplete primary school	Lower middle class	2,000-5,000	Caucasian White	1999	Spain