Fundación BBVA

The Culture of Science in Modern Spain

An Analysis of Public Attitudes Across Time, Age Cohorts and Regions

Martin W. Bauer
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Martin W. Bauer & Sue Howard
London, February 2011

Summary of Key Findings

The terms *culture of science,* or previously *Public Understanding of Science* (PUS), have a dual meaning. They designate both the assessment of a state of affairs (PUS, culture of science) and the activities targeted to enhance this state of affairs (PUS activities and the cultivation of science in the wider public). This report presents evidence of the state of affairs in Spain and assesses changes over the period 1989 to 2005 on the basis of a total 4058 observations. We build key indicators and compare time periods, generational cohorts and Spanish regions, and we benchmark these results against the rest of core Europe (i.e. EU11). A picture of the science culture of Spain within old Europe emerges that should be read not as an evaluation of past PUS activities, but as a marker of the changing strategic context for such activities in the future.

1. KNOWLEDGE AND IMAGE OF SCIENCE

- Overall the knowledge of science in Spain has increased from 1989 to 2005. It is getting better as we move from the older cohort to the youngest. Despite improvements, the level of scientific knowledge remains below the European average, i.e. the rest of the EU12. The knowledge indicator consists of 13 items, and Spain and the EU do not move in parallel on all items; e.g. by 2005 the Spanish exceeded the rest of Europe on awareness of the effect of antibiotics.
- Within Europe, Spain is among the countries with lower knowledge scores. Since 1989 this position has improved from rank 11 to rank 9, before Greece, Ireland and Portugal. The story is more optimistic if we consider generational cohorts: in the oldest cohort Spain is rank 11, while among the youngest born after 1977 Spain has reached midfield before Greece, Italy, UK, Belgium, Portugal and Ireland.
- Net of other influences, across the generations of Spanish we find a persistent gender gap in knowledge: men know more about science than women. But this is no longer the case for the youngest. There is also a consistent gap in knowledge between the levels of education, though the gap disappears among the youngest. The linearity of knowledge and age breaks down when we take into account education and place of dwelling. The most knowledgeable Spaniards are the *highly educated Baby Boomers;* education no longer differentiates knowledge of science among the younger generations. Also, young and highly educated city dwellers are now less knowledgeable than rural dwellers.
- Across the Spanish regions, Madrid, the Canary Islands, the East and the Northeast are more scientifically knowledgeable. Over the years, the Northeast has lost its position to the Northwest. The Northwest and the Centre have improved their knowledge most since 1989, while the South has gained least. The gap between the regions has increased over the period.
- With regard to understanding hereditary probability, the Spanish public is catching up fast with the rest of the EU, while a gap persists in the understanding of the logic of an experimental drug trial. Medicine, biology and physics are the prototype *sciences* in Spain. They are seen as being more distinct

from other subjects like economics, psychology or history than for the rest of Europe.
- The image of modern science is manifest in the status that is attributed to eight fields of enquiry. Medicine, physics, biology and astronomy are seen as prototypical modern sciences; psychology and, surprisingly, astrological horoscopes are the middle ground; while history and economics have a far lesser status. This hierarchy holds equally for all age groups, while younger Spaniards make the distinctions sharper than the older ones. Psychology occupies the middle ground very clearly, and has its highest status among the Generation X and in particular among women of Generation X.

2. INTEREST AND ENGAGEMENT WITH SCIENCE

- Increasing numbers of Spaniards declare themselves as "very interested in new scientific discoveries," while all in all interest follows a non-linear trend since 1989, first increasing then decreasing into the new millennium. While overall below the EU average, interest increases across the age cohorts, and the younger Spanish exceed the rest of Europe. Interest in science goes together with an interest in politics but is clearly separate from interest in sports. Those who are interested in science tend to recognise its role in protecting the environment.
- Across generations, and net of other influences, Spanish scientific interest approaches the EU average, while the differences between city dwellers and rural living increase across Spain. City dwellers are more interested in science, among the younger generations in particular. Net of other influences, knowledge and interest are closely related, but among the highly knowledgeable Spanish a gender interest gap opens up: only the educated women are less interested in science than men.
- The Spanish consider themselves consistently less informed about science, politics and sports than the rest of Europe. Across Europe, a visit to a science museum or a zoo is a minority activity; in Spain even more so. Middle-aged persons, probably with a family to entertain, are more likely to engage science in this way. There is little change over time, but regional variation, probably reflecting both opportunities as well as motivations. Those who visit a science museum recognise the relevance of science in everyday life.

3. SEVERAL FACETS OF ATTITUDES TO SCIENCE

- Attitudes to science need to be considered in various facets that move differently across time and generations. Spaniards have higher welfare expectations arising from science and technology than the rest of Europe. They are consistently less secular and less happy to trade off science against religion than the rest of Europe. Equally they are less progressive and more worried that life moves too fast because of scientific progress. Both secularism and progressivism show a non-linear trend since 1989, first approaching the EU average and then moving away from it again in recent years. Interestingly, in the land of the *torero,* people are increasingly ambivalent about scientific animal experiments. The more secular and the more progressive, the less clear support for this type of research.
- More Spaniards expect science and technology to stem the limits of growth by discovering new resources, while less and less Europeans believe so. This belief comes with general welfare expectations arising from science, but gets weaker with more knowledge.
- More Spanish see Europe lagging behind the USA in scientific and technological developments than the rest of Europe. This perception sits well among the more knowledgeable, the more interested, and those who think that science will increase their welfare.

4. MODELLING SCIENTIFIC CULTURE ACROSS SPAIN

- Structural analysis of the above indicators shows that they can be usefully combined for further analysis. The three indicators of knowledge, welfare expectation and engagement with science exhibitions form a complex of attitudes which we term *enculturation with science.* Net of other influences, enculturation is very different for primary, secondary and tertiary educated Spanish of the older generation, but identical among the younger ones. For the highly educated, the generational trend is non-linear with a peak among the Baby Boomers; for those with primary and secondary education, enculturation with science improves linearly from generation to generation.
- Together, interest and informedness about science—and knowledge—form an index of *attention to science.* Attention to science increases from the older to the younger generations; but among the youngest, those in primary education are overtaking those with secondary education.
- Secularism and progressivism form an index of *cultural progressivism* for Spain. Cultural progressivism is increasing steadily from the older to the younger generations among those in primary and secondary education, while for those in higher education the generational trend is not linear. The main carrier of cultural progressivism in Spain is the Baby Boomer generation. Among the youngest, the highly educated Spaniards are more culturally conservative than their less educated colleagues.
- An integrated statistical model of scientific culture in Spain suggests that generational group is the strongest influence on knowledge differentials. A young Spaniard is five times more likely to be above median knowledge than a Spaniard of the 1920s generation. Education makes a difference; and the improvement over time is real, net of other influences. The gender gap in knowledge persists, and it is only the Northwest and the East that stand out from the other regions, net of other influences—note that the advantage of Madrid and the Canaries observed earlier disappears. Secular Spaniards are 50 percent more likely to be above median knowledge than their religious compatriots, net of education, year and sex.
- Interest in science is also strongly influenced by generation and knowledge of science. A young Spaniard is between two and three times more likely to be very interested in science than an older one. Education also makes a difference for interest. The early 1990s show an unusual peak of interest; women are less interested; and the Centre, East and South are less interested in science than the rest of Spain, net of other influences.
- Welfare expectations attached to science equally depend on generation, but much less so than do knowledge and interest. Women harbour these expectations less than men, net of other influences, while the Northeast carries them more than elsewhere. In Spain, the more you know of science, the more you expect improvements in welfare, net of other influences.
- Overall we observe that in Spain knowledge, interest, secularism and progressiveness co-vary more strongly with age cohorts than with time period, and even less with region. Feeling informed, engagement with and attention to science, enculturation and welfare expectations co-vary more with time period than with age cohort and region everything else being equal. The observed effect sizes of these influences are generally small and in the area of 5 percent. Only the period effect on informedness, and the cohort effect on knowledge and enculturation, reaches 15 percent.

1
Basic Indicators and Their Change over Time

The term *culture of science* or *Public Understanding of Science* (PUS) designates both the assessment of a state of affairs and the activities which are targeted to enhance this state of affairs. This report presents evidence of the state of affairs in Spain, and assesses the changes over the period from 1989 to 2005 on the basis of four nationally representative attitude surveys provided by Eurobarometer.

In terms of activities of fostering and enhancing the public understanding of science, Spain is considered to be complacent. Analysts characterise the Spanish scientific community as living in a *golden cage,* where they see no need to engage in outreach activities and this passivity is tolerated by a wider public that is seen as less interested than elsewhere in Europe. For an analysis of the level of mobilisation of Spanish scientists for public engagement, see Torres-Albero et al. (2011); Bentley & Kywik et al. (2011); and Bauer & Jensen (2011).

The state of affairs of PUS is operationalised by a set of questionnaire-based indicators including: factual *knowledge,* various facets of *attitudes to science, being interested in* science, feeling *informed* about science, and *engagement* with science exhibitions, and an assessment of the lag between Europe and USA in matters of science and technology. These indicators provide individually and jointly a complex picture of the standing of science and technology in society and in different segments of society and how this standing might have changed over time. Change is assessed in real time (1989 to 2005), and virtually, across five generational cohorts from *born in the roaring 1920s* to *born after 1977 into a new world order,* and compared across seven Spanish regions.

While the public's understanding of science is in part influenced by the PUS activities of the scientific community, i.e. the first sense of PUS, our report cannot be read as an evaluation of the latter's effectiveness, as other influences constrain the public's understanding of science. Rather the indicators of PUS as presented here provide the context, and a picture of the changing context, within which public engagement activities must unfold at present and in the future. In that sense our report provides markers of context rather than indicators of performance.

1.1. DATABASE AND LIMITATION OF THE QUASI-COHORT ANALYSIS

The basis of the present analysis is the recently *integrated database* of four Europe-wide attitude surveys (Eurobarometer 1989, 1992, 2001 and 2005), an effort undertaken in collaboration with the GESIS, the German social science data archive (see Bauer, Shukla & Kakkar 2009). These data rounds have had their own history of reporting and at times polemical reception across Europe (e.g. Pardo & Caro 2002 and 2004; for a review see Bauer 2008). The integrated database allows us to go beyond these past discussions. Marking a step change in data analysis, we are considering these rounds in conjunction to assess changes over time by separating *year-to-year* changes from changes across sliding *age cohorts.* This should allow us to assess the impact of recent changes in science-society relations within the long-term changing historical context.

Age cohorts are groups which share the common educational, political and cultural experience of a generation. The demarcation of age cohorts is to a certain extent arbitrary, taking into account some historical events over the last century, and the statistical requirement of roughly equal cohort size to support the comparative analysis. Because age cohorts are constructed ex-post from relatively recent cross-section surveys on a sliding age scale, we are strictly speaking of *quasi-cohorts.* The resulting generation cohorts do not comprise the entire age range. We do not know how the pre-war generation would have responded in their youth, nor do we know as yet how the youngest generation will respond in their older age. For a complete cohort study we need a few more survey rounds in the years to come. Hence some limits are pre-set for the analysis.

This limits our ability to truly separate age and generation effects—age and generation are too closely related in our data. We will not be able to split how much the variance in knowledge, interests and attitudes are a function of the generational experiences or of simply getting older along the life cycle. The interesting question, whether attitudes to science are a matter of growing older or of a generational common fate, cannot be answered conclusively. Age and cohort remain confounded in our analysis. The answer to this age versus cohort question will remain open for another few survey rounds.

However, we will be able to separate the generation effect—or age effect—from the particular period context of data collection—this might include a *house effect* of the company collecting the survey data, as the data collection companies have changed over the years. For purposes of evaluating the changing relations between science and society in the country and beyond, *year* is the key variable, as it allows us to map them before and after of key events and changing circumstances.

For the definition of the age cohorts, we are applying the following banding of age groups:

New Order, born since 1977: this is the youngest cohort of respondents, growing up after the end of the Cold War, and waking up to the rhetoric of the *new world order* and the final victory of the capitalist style of economy, getting their education within the rhetoric of IT and biotech *revolutions* of the late 20th century. This is the generation of the PC and Internet euphoria of 1995-2002. In the Spanish context, this is the first post-Franco generation born and growing up in the new form of government after 1975.

Generation X is the generation born between 1963 and 1976. Globally speaking, they are the product of the birth control *revolution* and grow up through the oil crises of the 1970s, the nuclear issues of the 1980s, the anti-nuclear protest, nuclear disarmament debates and the Star Wars initiative. In the particular Spanish context, this is the generation growing up in the later years, when the Franco Regime is in decline.

Baby Boomers were born between 1950 and 1962. They grew up during the optimism and modernisation drive of the post-war period. They witnessed a long period of economic prosperity between 1945 and 1970. During this period Western societies become *affluent* and free of material concerns. This generation is the protest generation of the 1970s, adheres to idealistic aspirations, and they are the carriers of post-material values. They developed scepticism over sweeping notions of *progress* arising from science and technology. In the Spanish context, this generation carries the transition from Franco's old Spain to the new Spain after 1975 and into European Community Membership in 1986.

Crisis & War, born between 1930 and 1949: witnessing WWII, they formed the immediate post-war generation educated during the Cold War. This generation carried the *nuclear enthusiasm* of the 1950s, which promised an energy revolution, *energy too cheap to meter* in the atomic society. They carry material aspirations of post-war modernisation across Europe. In the Spanish context, this is the generation of the Franco years, growing up during and immediately after the Civil War, 1936-1939.

The Roaring 20s: finally, is the generation born before 1930, growing up through the buzzing period of the 1920s or the crash of 1929, and the economic crisis that followed; they fully experienced

the upheavals of fascism leading into WWII. Some of them carry memories of two world wars, and the Spanish context of the Civil War of 1936-1939.

In the following, we comment on some striking changes in the key items and define the indicators that will be used in the later analysis. All variables are tabulated in Appendix 1 on a year-by-year basis.

1.2. INTEREST, INFORMEDNESS AND ENGAGEMENT WITH SCIENCE ON EXHIBITION

Spanish interest in new medical discoveries, new technologies and scientific discoveries increased from 1989 to 2005, while the rest of EU12 sustained a consistent level of interest. Those Spaniards who are *very interested* in these topics have increased considerably over this period. For example, 60 percent were very interested or interested in new technologies in 1989, and of these, 18 percent were very interested. The combined figure rose to 76 percent in 2005, with 27 percent very interested—a difference of 9 percent and an increase of 50 percent. In the EU countries, the figure changes little, from 75 percent to 79 percent interested and very interested, respectively. Very interested Europeans were 31 percent in 1989 and 32 percent in 2005.

Figures of reported informedness on scientific matters differ in Spain and the EU11: the EU11 sample reports higher levels of informedness—including both very well and moderately well informed—in each round; this difference sits in the context of overall higher levels of reported informedness in the EU11, who also state they are more informed about sport and politics. In both Spain and the EU11, very well and moderately well informed percentages remain steady over the years.

Visits to cultural institutes have often been used as a proxy for public engagement in the analyses, since they indicate independently motivated activity—other than, for example, formal education. Figures are quite similar for Spain and the EU11. The majority have never visited a science and technology museum, a zoo or aquarium, a natural history museum, nor a public library or an art museum. In the EU12, it seems neither science nor broader cultural engagement is to be found.

There has been a dip in visits to zoos or aquariums since 2001 in both the EU and Spain and this dip is appreciably more in Spain. 87 percent and 81 percent in 2001 and 2005, respectively, had never visited these, compared to in the EU11 73 percent and 71 percent in 2001 and 2005. Figures for visits to public libraries show a similar pattern.

Considering the availability of measures from a complete database across all four waves of surveys, the main indicators arising from these observations are:

- *Intdis* indicates the respondent's interest in scientific discoveries; this declaration is highly correlated with interest in new medical developments and interest in new technology. There is little or no correlation with other interests in life such as politics or sports.
- *Infodis* measures the self-declared informedness about new scientific discoveries. The informedness indicator behaves very much like the interest indicator.
- *Sciact* measures intensity of visiting science museums or zoos.

Table A.3.3 in Appendix 3 shows that *Intdis* is positively correlated to assigning a role to science in the protection of the environment (r = 0.15) and to considering it important in everyday life (r = 0.27). *Sciact* is closely related to the latter as well; those who frequent science museums or zoos consider science relevant to their daily life (r = 0.24).

1.3. SCIENCE LITERACY, TEXTBOOK KNOWLEDGE AND IMAGES OF SCIENCE

Looking at the *true/false* knowledge items, all measured in 1989, 1992, 2001 and 2005, there is a mixed picture, with differences across time, between Spain and the EU, and across items.

One can identify seven patterns. In pattern one, Spain's knowledge approaches the level of the EU average. This is true of the items centre of earth and radioactive milk. For the item oxygen, one observes pattern two, where knowledge remains steady in Spain and the EU11, but Spanish knowledge is around 10 percent lower. In pattern three, knowledge of electrons is similar for both Spain and the EU, and across the different rounds. In pattern four, Spain and the EU11 show rising knowledge, but the EU remains consistently higher. This is true for the items continents moving, gene deciding sex, earliest humans, lasers and radioactivity. In pattern five, Spain's knowledge remains stable—around 45 percent correct—, while the EU dips from above the Spanish score to below it—from around 60 percent to 40 percent correct. This is the case for the item antibiotics. In pattern six, both Spain and the EU11 have similar, rising scores (human beings). For the items earth movement-sun and earth movement-time, the percentage of correct answers in Spain and the EU11 are similar, but drop from 1989 to 2005, forming pattern seven. Europeans seem to become more uncertain on the basic astronomical features of our planet.

Knowledge is also tested on two questions exploring the understanding of scientific method. Here we can compare 1992 and 2001. One asks about how best to undertake a drug test. Results are similar for Spain and the EU, but Spain scores around 10 percent less *correct* choices. In the understanding of experimental logic, a gap persists between Spain and the EU average.

The second question on this topic asks about the probability of inheriting a hereditary disease. In Spain, there has been an increase in correct understanding of probability, from 49 to 67 percent from 1992 to 2001. Across the EU, this increase has been slower, from 63 to 69 percent in this period, which suggests that Spain is moving towards the EU average on this matter.

How do Spain and the rest of the EU differ in their judgement about what research pursuits are more or less scientific? On the topics of astrology and homeopathy, results are similar for Spain and the EU: in 2005, just over half on either side believe homeopathy to be scientific; this is also true for astrology in 1992, but in 2005 this drops to below half of the sample.

Medicine, biology and physics are seen as the most scientific overall. They are the prototypes of science in Spain. In the case of these subjects, and economics, psychology, astronomy, history and mathematics, the EU11 are more likely to regard them as scientific than the Spanish sample. Additionally, except for mathematics and physics, as time has passed a greater proportion of these subjects have been judged to be scientific in Spain and in the EU11. Astronomy and physics are perceived fairly consistently—for example, in Spain, astronomy is seen by 79 percent as scientific in 1992, and 77 percent as scientific in 2005. In the EU11 the change is from 83 percent to 82 percent.

The key indicator arising from these observations is:

- *K13* measures the scientific literacy of the respondent indicated by *correct* answers on 13 quiz questions reflecting commonly encountered textbook items of physics and biology. The internal consistency of this 13-item indicator is given by Cronbach's Alpha, which for Spain (a = 0.71) is slightly better than for the rest of Europe (a = 0.66).

Table A.3.4 in Appendix 3 shows that K13 is associated with other knowledge indicators such as understanding of probability (r = 0.38) and experiments (r = 0.27), and correlates positively with most attitude indicators except the statement that science is pushing the limits of growth by making new natural resources available (r = -0.18). It is also related to declaring non-adherence to Catholicism or any other denomination (r = 0.23).

The image of modern science can be gauged by the question "how scientific is...[X]" (response: scientific, not scientific, DK). This question was asked for eight fields of knowledge and enquiry. Figure 1.1 shows the relative ranking of these fields in terms of *scientific status* according to age cohort. The following observations were gained on how the Spanish understand modern science.

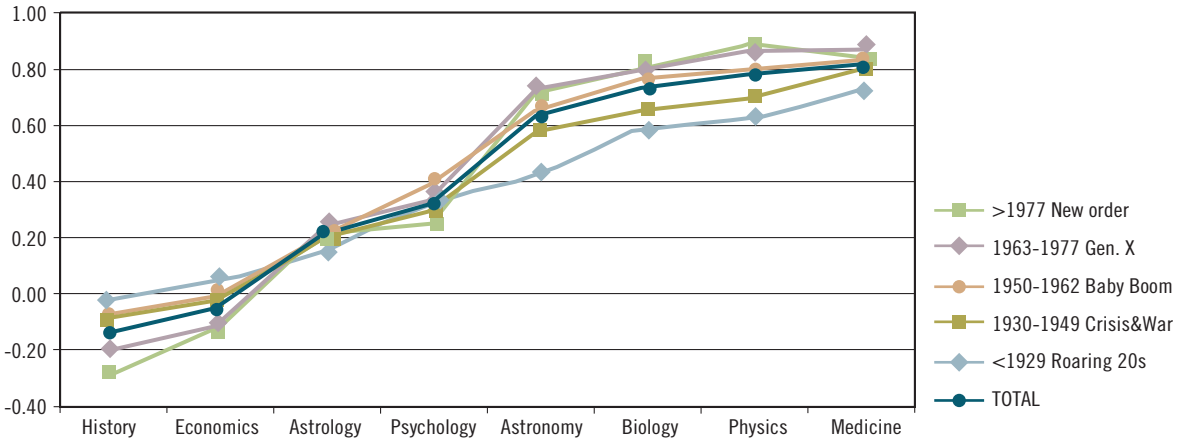

Figure 1.1 Ranking of eight fields of knowledge for each age cohort in terms of their status as science (1 = scientific / -1 = not scientific)

The Spanish see the hierarchy of modern science in the following manner: astronomy, biology, physics and medicine are prototypical sciences. Astrological horoscopes and psychology occupy the middle ground—the relatively high status of astrology could be in part due to semantic confusion with *astronomy* (Allum & Stoneman 2012). History and economics are granted far less scientific status than all the other fields. For economics, with its mathematical aspirations modelled on physics, this must be somewhat surprising.

If we look at each field's association with age cohort, after controlling for education, we find that physics, biology and astronomy increase in science status from one cohort to the other; and medicine equally so. However, its highest status is found in the Generation X group with slightly less appreciation among the youngest. By contrast, history and economics have less science status among the younger generations than among the older ones.

All generations share the same view on the middle status of astrological horoscopes. However, psychology is seen differently by women and men, and the generation effect is non-linear: the science in psychology is mostly appreciated by the Baby Boomer generation, and this is particularly in evidence among the women.

Generally, we can say that the younger generations make sharper distinctions between these fields of knowledge than the older ones, but for all age groups the hierarchy of sciences remains the same, though not entirely as envisaged by Auguste Comte in the 19th century.

1.4. FACETS OF ATTITUDES TO SCIENCE

For example, looking at the item "scientists should be allowed to undertake research that causes pain and injury to animals," we see that in Spain, those who neither agreed nor disagreed rose from 6 percent to 23 percent. In the EU11, neither/nor responses rose from 7 to 17 percent. We note across Europe a tendency towards neutrality or increased ambivalence on this issue of animal experimentation, a trend that is accentuated in Spain.[1]

Looking at the different attitude facets, some differences can be found, without a pattern emerging—the items appear to be measuring—, at the very least; different attitude facets rather than one unidimensional attitude measure.

[1] This could also be a *house effect* arising from a change in protocol, when Eurobarometer changed the company conductin the interviews. Survey companies vary in the way they deal with DK-responses, which increases or decreases their frequency.

The more intriguing results include the following two items: 25 percent of the Spanish agreed with "thanks to scientific and technological advances, the earth's natural resources will be inexhaustible" in 1992, rising to 34 percent in 2005. In the EU11, however, 34 percent agree in 1992, dropping to 26 percent in 2005. We can take this measure as the perceived confidence in science to stretch natural resources and thus to help to avoid the limits of growth. Spain and Europe go in different directions on this expectation. While Europe in general gets more sceptical in that respect, Spain harbours higher expectations. While in the EU11, this item evokes a constant level of scepticism in 1992, 2001 and 2005—58, 59, 56 percent respectively—, in Spain, explicit scepticism drops towards 2005—55, 57 and 34 percent respectively—, replaced by higher ambivalence—27 percent who neither agree nor disagree in that year—and agreement.

Over the years, Spain is consistently more likely to agree that "science makes our way of life change too fast," compared to the EU11—average agreement in Spain is 71 percent compared to 58 percent in the EU11. Three attitude facets arise from the complete database:

— Att1 measures the expectation that science will improve the general welfare of citizens; people agree with the statement "science and technology are making our lives easier and more comfortable."
— Att3 measures the degree of secularism that is indicated if a respondent rejects the concern that might arise from a trade-off between science and religion: respondents disagree with "we rely too much on science and not enough on faith."
— Att9 measures the progressivism expressed by rejecting the statement "science makes our lives change too fast."

Att3 and Att9 are inter-correlated, and both are only loosely associated with Att1. They thus can be considered to assess a different attitude facet. Table A.3.3 in Appendix 3 also shows that Att1 (welfare expectations) is closely related to expectations that scientific research will provide new opportunities for future generations (r = 0.29); that science and technology pushes the limits of growth by discovering new natural resources (r = 0.17); and that science is indeed important in everyday life (r = 0.16). By contrast, people with Att3 (secularism) tend to reject the idea that science pushes the limits of growth (r = -0.17), but expect science to play a role in protecting the environment (r = 0.12), and are less likely to be professing Catholics (r = 0.19). Respondents with Att9 (progressivism) also believe that scientists can be dangerous (r = 0.12).

1.5. SPAIN'S VIEW OF THE POSITION OF SCIENTIFIC EUROPE VIS-À-VIS THE USA

When asked in which areas the EC is active, Spanish and European participants agree for the most part that the EC is more active in 2001 than in 1989. In matters of agriculture, energy, science and technology and the environment, Spain is generally less aware of EC action, although in matters of defence, Spain is at one with the EU11: 16 percent of Spaniards are aware of EC activity on defence in 1989; 41 percent saw this in 2001. In the EU11, the figures from 1989 and 2001 are, respectively, 16 percent and 42 percent.

Comparing Europe to the USA, a substantial proportion of the EU11 rate Europe as behind the USA, but a *higher* proportion of the Spanish participants see Europe as behind in scientific discovery, industry and technology, and, although to a lesser degree, behind in life technology. This is consistent from 1989 to 2005. The key variable arising from these observations is:

- *Rival* combines the assessment of a lag between Europe and the USA in the three areas of discovery, innovation and biotechnology in particular.

Rival is mainly correlated to scientific knowledge (r = 0.20), interest in science (r = 0.10) and welfare expectations Att1 (r = 0.09) as shown in Table A.3.4 in Appendix 3. Previous research has shown that differentials in awareness of EU actions on science are a proxy of the respondents' general attitude to European integration (see Bauer, Durant & Evans 1994). As European inte-

gration is not our focal topic, we will not investigate this facet of public opinion any further.

1.6. THREE DIMENSIONS OF SPAIN'S SCIENCE CULTURE

A structural analysis of the inter-relations between these seven indicators (not considering *rival)* shows three dimensions that could be usefully applied for further analysis. A first factor combines interest and informedness, as well as knowledge (22 percent of the variance). We might call this factor *Attention to Science.* A second factor combines more of knowledge, engagement with science exhibits in museums and zoos, and welfare expectations (18 percent of the variance). We might call this complex the *Enculturation with Science.* Finally, the third factor brings together the indicators of secularism (Att3) and progressivism (Att9; 18 percent of the variance), and we might call this the *Cultural Progressivism* index (see Appendix 3). The relative distinctness of these three indices is obvious, if we include the measures of general interest and informedness about sports, and interest and informedness about politics. Informedness and interest in the countries' politics is related to attention to science, but informedness and interest in sports is an entirely separate matter from all the other structural components. Science and politics seem to have some affinity in Spain, while sports tap into an entirely different sphere of everyday life.

2
Benchmarking Spain Against the Rest of Europe

In the following, we report observations on the key indicators of PUS for Spain benchmarked against the European average, i.e. compared to the core of EU12. We chose this comparison because the database is complete for EU12 across the four periods under consideration; the larger Europe comes into the survey frame only after 2002. Three facets of science attitudes are comparable across all four periods: agreeing with "science makes our lives healthier and more comfortable" *(welfare expectation,* Att1), rejecting "we depend too much on science and not enough on faith" *(secularism;* Att3) and rejecting "science makes our lives change too fast" *(progressivism,* Att9). The indicators are standardised towards the European average (EU12: M = 0, SD = 1).

Figure 2.1 (first panel) shows that Spanish welfare expectations (Att1) are above the EU average in 1992 and 2005, and below in 1989 and 2001. The linear trend is at most slightly declining (r = -0.7). The secular mentality (Att3) remains below the EU average but gains adherence towards the new millennium, when it retreats again (linear r = 0.08; aggregate non-linear r = 0.98). The same is true for progressivism (Att9), which also remains below the EU average but follows a non-linear trend since the 1980s (linear r = n.s.; aggregate non-linear r = 0.92). Most Spaniards continue to think that life is changing too fast and that religion is underrated when it comes to leading their everyday lives. With regard to the expectation that science and technology will increase welfare, Spain stays close to the European average.

Figure 2.1 (second panel) also shows the development of knowledge and interest over the period of observation. Scientific knowledge clearly increases and approximates the European average by 2005 (linear r = 0.21). Interest in new

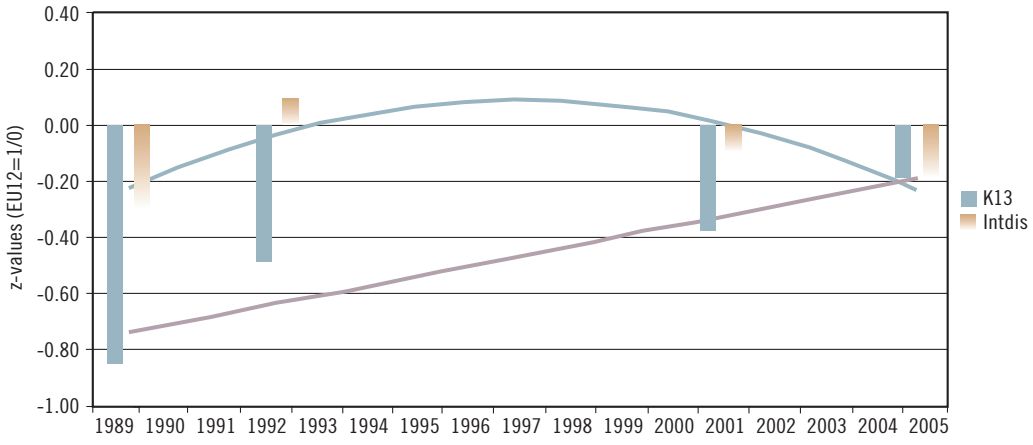

Figure 2.1 ***(first panel)*** Attitude facets, knowledge and interest by year, standardised to EU12 overall

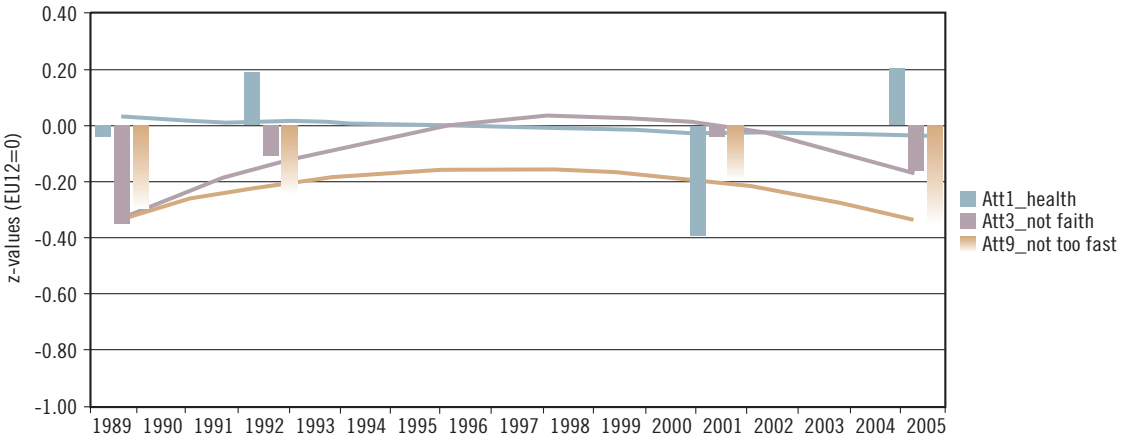

Figure 2.1 ***(second panel)*** Attitude facets, knowledge and interest by year, standardised to EU12 overall

scientific discoveries follows a non-linear path; like the attitude facets of progressivism and scientism, it increases towards the new millennium but subsequently decreases again (linear r = n.s.; aggregate non-linear r = 0.77). Overall, we can say that the public understanding of science is dynamic over the years. However, the key indicators are not moving in parallel since the 1980s; only the indicator *scientific knowledge* is pointing clearly in one direction: upwards.

Figure 2.2 shows the same indicators in relation to the five generational cohorts which were defined at the beginning of this report: Roaring 1920s, Crisis & War, Baby Boom, Generation X, and New Order born after 1977. This gives a different angle on the *historical development* of science culture. All generations share a similar level of welfare expectations (Att1), hovering just below the European average, and the younger ones are a bit more optimistic. The younger generations are clearly more secular (Att3); the youngest Spaniards even more so than the rest of Europe. By contrast, all of Spain remains culturally conservative (Att9), believing that "science is changing our lives too fast." The later born do not differ from earlier generations in that respect, and that is considerably different from the rest of Europe.

Figure 2.2 (second panel) also shows the comparison of age cohorts on interest in new discoveries (Intdis) and knowledge (K13). Interest is science is increasing from the older to

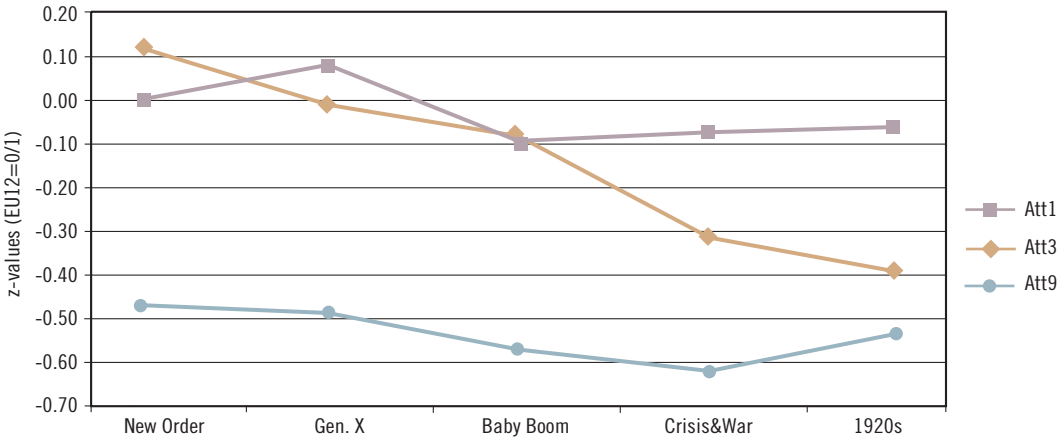

Figure 2.2 ***(first panel)*** Attitudes, knowledge and interest by cohort

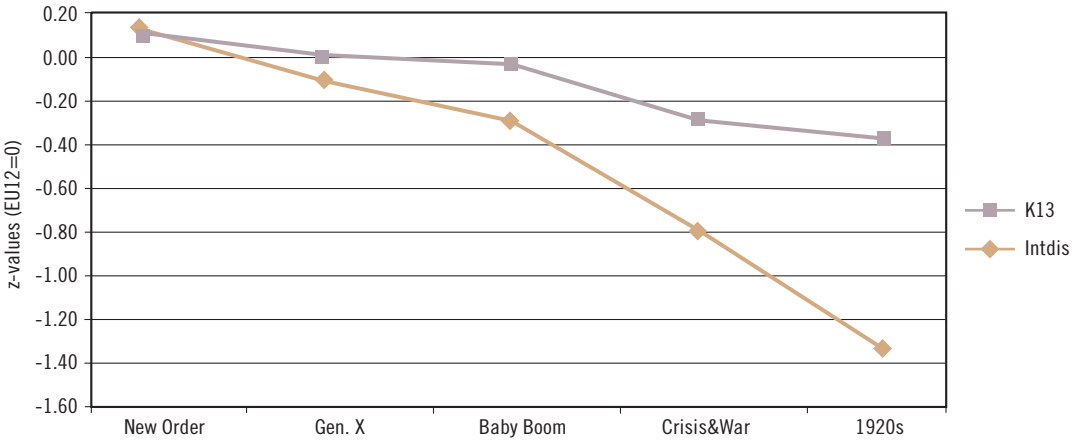

Figure 2.2 ***(second panel)*** Attitudes, knowledge and interest by cohort

the younger generation. The older generations stayed below the EU average; the younger generations of Spain are now above the European level of interest in science. This generational shift is even more accentuated for knowledge with a steep gradient: again the New Order Spaniards are more scientifically literate than the European average, while the pre-WWII generations remain far behind, at around one S.D. and more from the European average.

Table 2.1 compares Spain on the level of knowledge relative to other European countries. The upper part of the table shows the rank position by survey period. In 1989, Spain was at the 11th position, which improved to 8th or 9th after 2000. Overall, the position of Spain is 9, before Ireland, Greece and Portugal, on scientific literacy measures.

The generational shift that takes place is clearly visible in the second ranking shown in the lower part of Table 2.1. Among the oldest generation born in the 1920s, Spain holds the second but last position just before Portugal. With its youngest New Order generation, Spain has reached the European middle field of 6th position, behind France, and overtaking Belgium, UK and Italy, whose youngsters seem to be losing out on science relative to Spain.

TABLE 2.1: The situation of Spain in comparison with other EU countries (ranking on K13)

Years	Total	2005	2001	1992	1989
NL	1	3	1	7.5	3
DK	2	1	2	3	7
LUX	3	5	4	1	1
F	4	6	5	3	2
D	5	2	6	3	5
IT	6	8	3	5	4
UK	7	7	7	6	6
B	8	4	9	7.5	8
E	9	9	8	9	11
EIRE	10	11	11	10	9
GR	11	10	10	11	10
PT	12	12	12	12	12

TABLE 2.1 *(cont.):* The situation of Spain in comparison with other EU countries (ranking on K13)

Cohort	>1977	1963-1976	1950-1962	1930-1949	<1930
	New Order	Gen. X	Baby Boom	Crisis&War	Roaring20s
F	5	5	2	5	1
LUX	4	1	6	2	2
NL	2	3	3	2	3
D-West	3	6	5	3	4
DK	1	2	1	4	5
UK	9	8	7	6	6
B	10	9	8	8	7
IT	8	4	4	7	8
EIRE	12	11	11	9	9
GR	7	10	10	11	10
E	6	7	9	10	11
PT	11	12	12	12	12

3
Scientific Culture Across Generations

Comparing the age cohorts in Spain with similar groups across Europe and controlling for other influences, a complex picture in search of an interpretation is shown. For these comparisons we apply MANOVA (multiple analysis of variance), with knowledge, interest and attitude (Att1) as the dependent variable, Spain compared to the rest of Europe, urban dwelling and age cohorts as factors, controlling for potentially confounding variables such as levels of education, sex, and year. The marginal figures for the dependent variables resulting from these models are shown in the figures. Overall, we observe that, for the seven key indicators correlated with age and with generational cohort, generational age is a more important correlate than biological age for the Spanish culture of science (see Appendix 3, Table A.3.3). This is particularly true for knowledge, informedness and attitude facets. However, it is not so clear for interest and engagement with museums and zoos. The latter are indeed influenced by the life cycle of having children and looking after their welfare and leisure activities, which often makes science relevant where it would otherwise not be.

Figures 3.1 and 3.2 indicate significant interaction effects taking Spain versus the rest of EU as a factor, meaning that the story is significantly different in Spain from the rest of Europe, everything else being equal. The model shown is statistically significant for all the main effects and the interactions.

Let us take a look at knowledge and welfare expectations in Figure 3.1. Knowledge is clearly converging across the age cohorts. Across Europe, the gradient of knowledge is increasing across the generations and, if among the older generations there existed a gap between Spaniards and the rest of Europe, among the younger, post-Baby Boom generations, there is no such a gap any longer. Young Spain has arrived in Europe as far as scientific literacy is concerned. Note that the earlier observed excess of young Spaniards beyond the European average does not hold up, if we control for education and sex. On closer inspection, the young Spaniards have reached the European average, but are not yet beyond.

The picture is also complex when we look at expectations for human welfare arising from science and technology. Here, the generations have very different views in Spain, while for the rest of Europeans the expectations remain fairly level, with a slight trend towards lesser expectations. The Baby Boom generation is by far the most pessimistic, and Generation X is the most optimistic, even more than the youngest age cohort. The older two cohorts do not deviate much from the European average. This is a rather curious observation that for the moment defies an obvious explanation.

The secularism of Spaniards remains below the European level for all age cohorts, except for the youngest, where this gap has disappeared (Figure 3.1, first panel). We have already observed this trend above. We observe a similar conversion for interest in new scientific discoveries (Figure 3.1, last panel). Interest is generally increasing across Europe, everything else being equal, and the gap between Spain and Europe which existed for the pre-WWII generations does not longer exist for the younger age cohorts. With regards to interest in science, Spain has arrived in Europe. We note that this contradicts the assumptions which Torres-Albero (2011) recently made for his analysis of the demand context for the mobilisation of scientists in Spain.

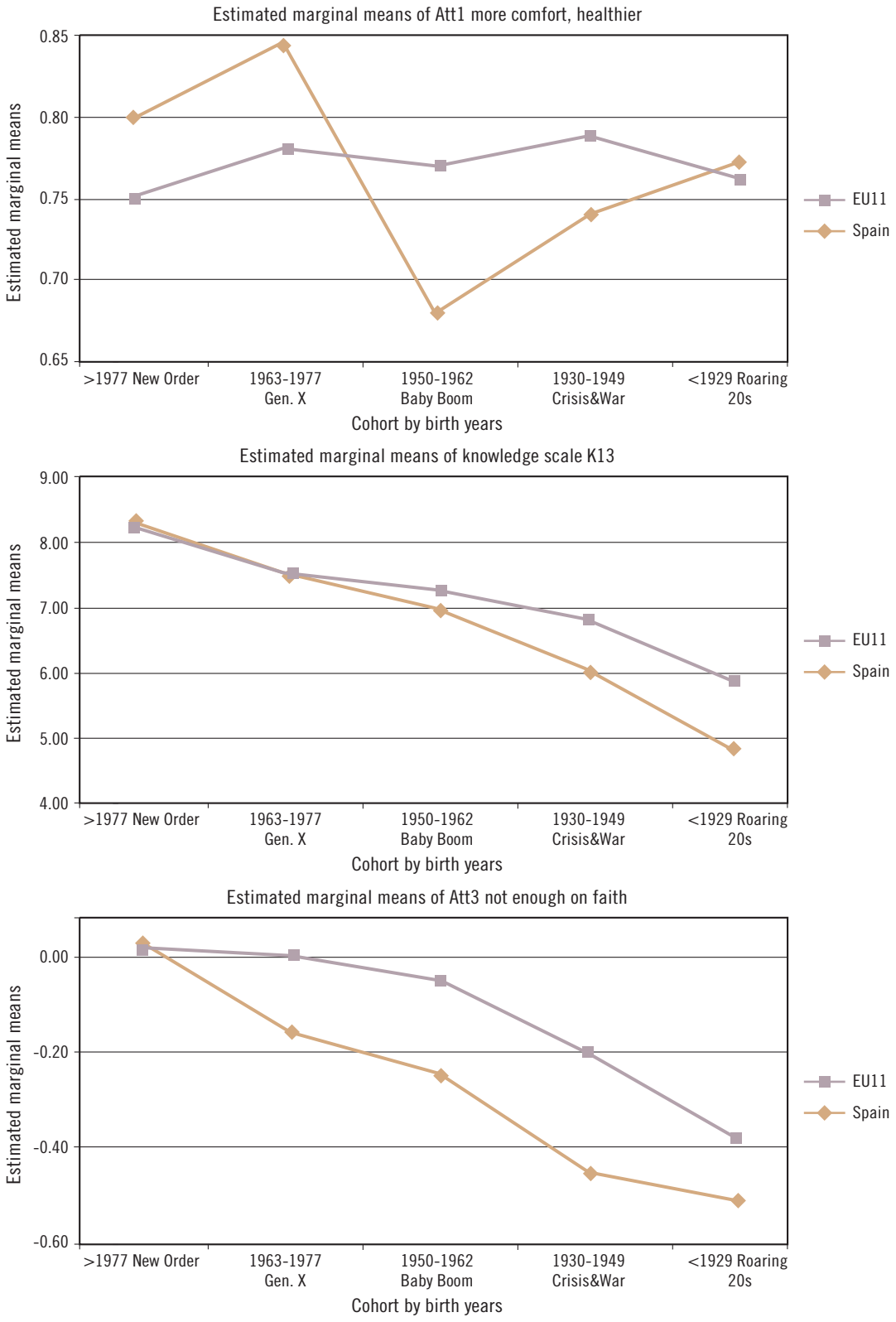

Figure 3.1 Comparing Spain to Europe on science knowledge and welfare expectations across age cohorts. Figures show MANOVA estimated marginal means on a scale from 1 to 13 for knowledge, and -2 to +2 for attitudes

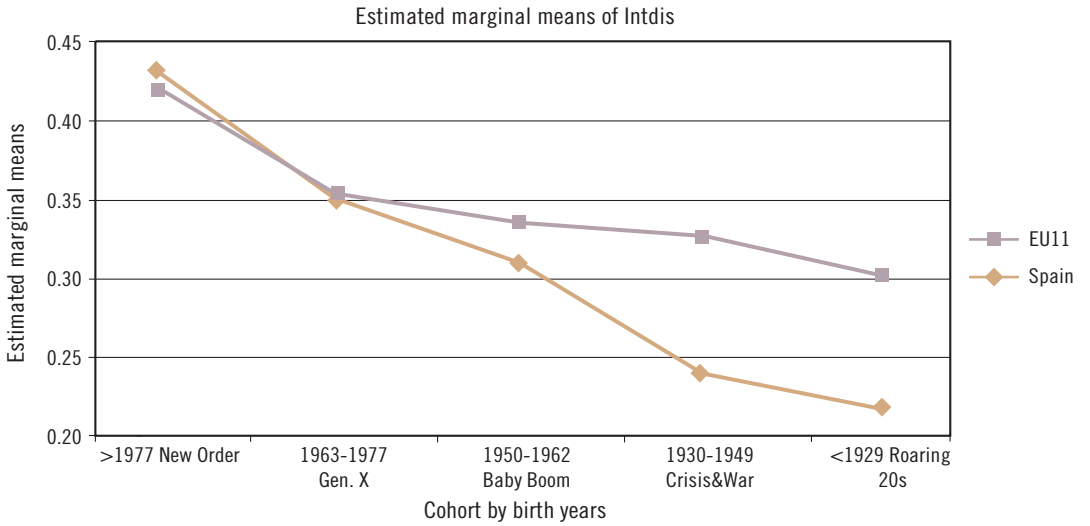

Figure 3.1 ***(cont.)*** Comparing Spain to Europe on science knowledge and welfare expectations across age cohorts. Figures show MANOVA estimated marginal means on a scale from 1 to 13 for knowledge, and -2 to +2 for attitudes

Figure 3.2 shows the relationship between secular attitudes and interest in science by gender and the level knowledge. Secular attitudes in Spain have clear knowledge gradients for women but not for men. While highly knowledgeable Spanish women are more secular in their outlook, this is not so clear for Spanish men. In effect, less scientifically literate men are more secular than women of similar literacy, while highly literate women are more secular than men of similar standing, everything else being equal. This result points towards a gender gap in the scientific culture in modern Spain. Scientifically cultured Spanish women are more secular than men. The story is slightly different for interest in new scientific discoveries. For Spanish men, there is a clear linear gradient: the more knowledgeable, the more interested. This is not the case for women. The most knowledgeable women are less interested than men, while there is no difference for men and women on lesser levels of scientific knowledge.

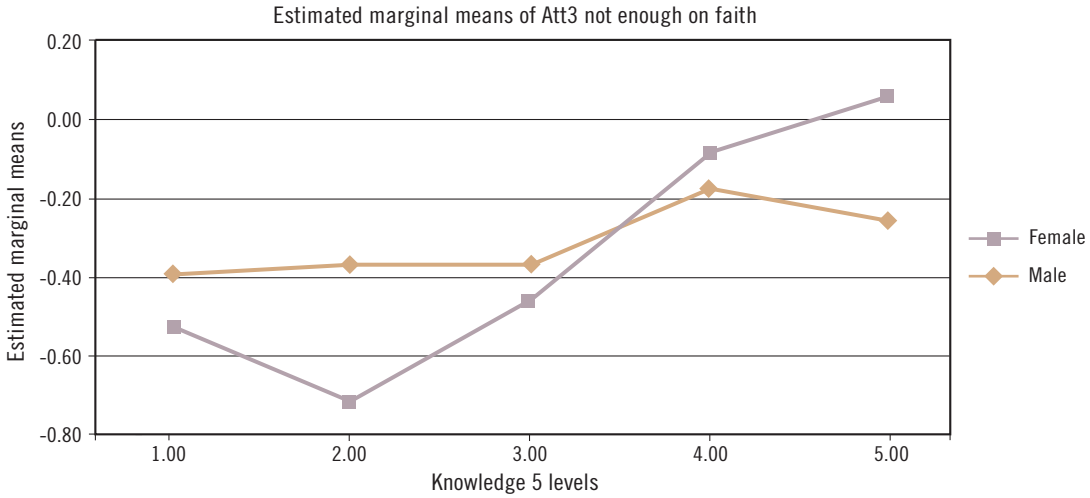

Figure 3.2 Gender gaps in Spain: attitudes and interest in relation to gender and level of knowledge across Spain. Figures show MANOVA estimated marginal means after controlling for cohort, level of education and year

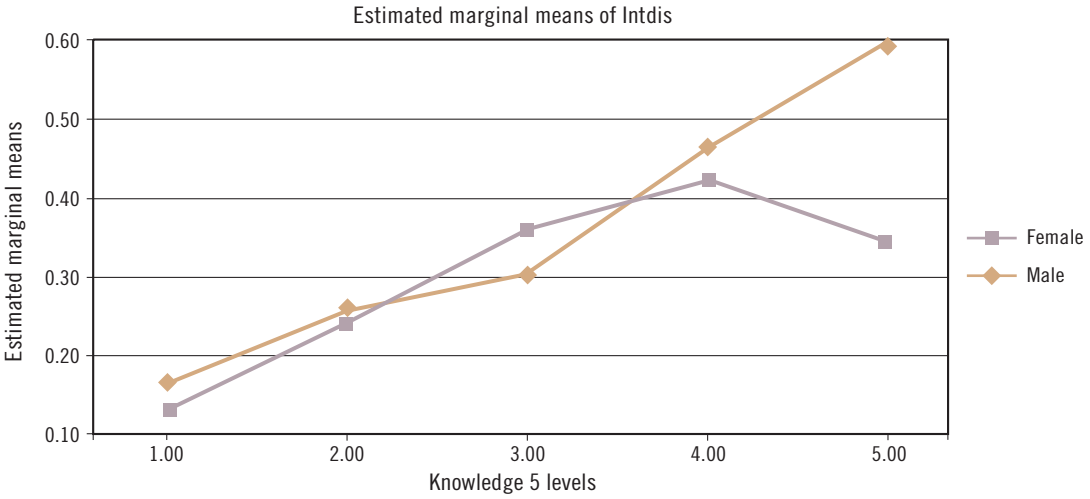

Figure 3.2 ***(cont.)*** Gender gaps in Spain: attitudes and interest in relation to gender and level of knowledge across Spain. Figures show MANOVA estimated marginal means after controlling for cohort, level of education and year

Figure 3.3 brings us back to considerations of age cohorts, this time in combination with level of education, sex and rural or urban dwelling, controlling for all other variables. Knowledge in relation to different levels of education shows an interesting pattern across the age cohorts. While primary education in science has clearly improved from the 1920s generation to Generation X, this is not so clear for the secondary level of education. Here, the generational gain in science literacy is not as obvious. Even more striking is the non-linear relation between knowledge and the age cohorts at the tertiary level of education. University educated Spaniards are now less scientifically literate than the middle generations. The bearers of science culture of Spain are the tertiary educated WWII, Baby Boom and X generations. The gender gap, which can be observed in other places as well, persists across four generations but is no longer in evidence among the New Order generation in Spain. While older women are generally less scientifically literate than men of

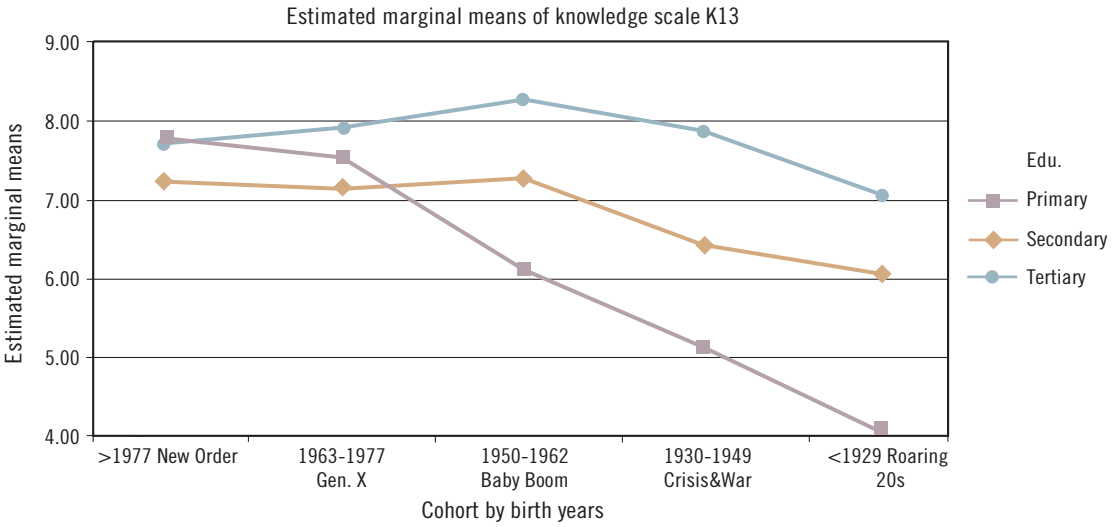

Figure 3.3 Knowledge and interest in relation to level of education, sex and urban or rural dwelling. Figures show MANOVA model estimated marginal means after controlling for level of education and year of survey

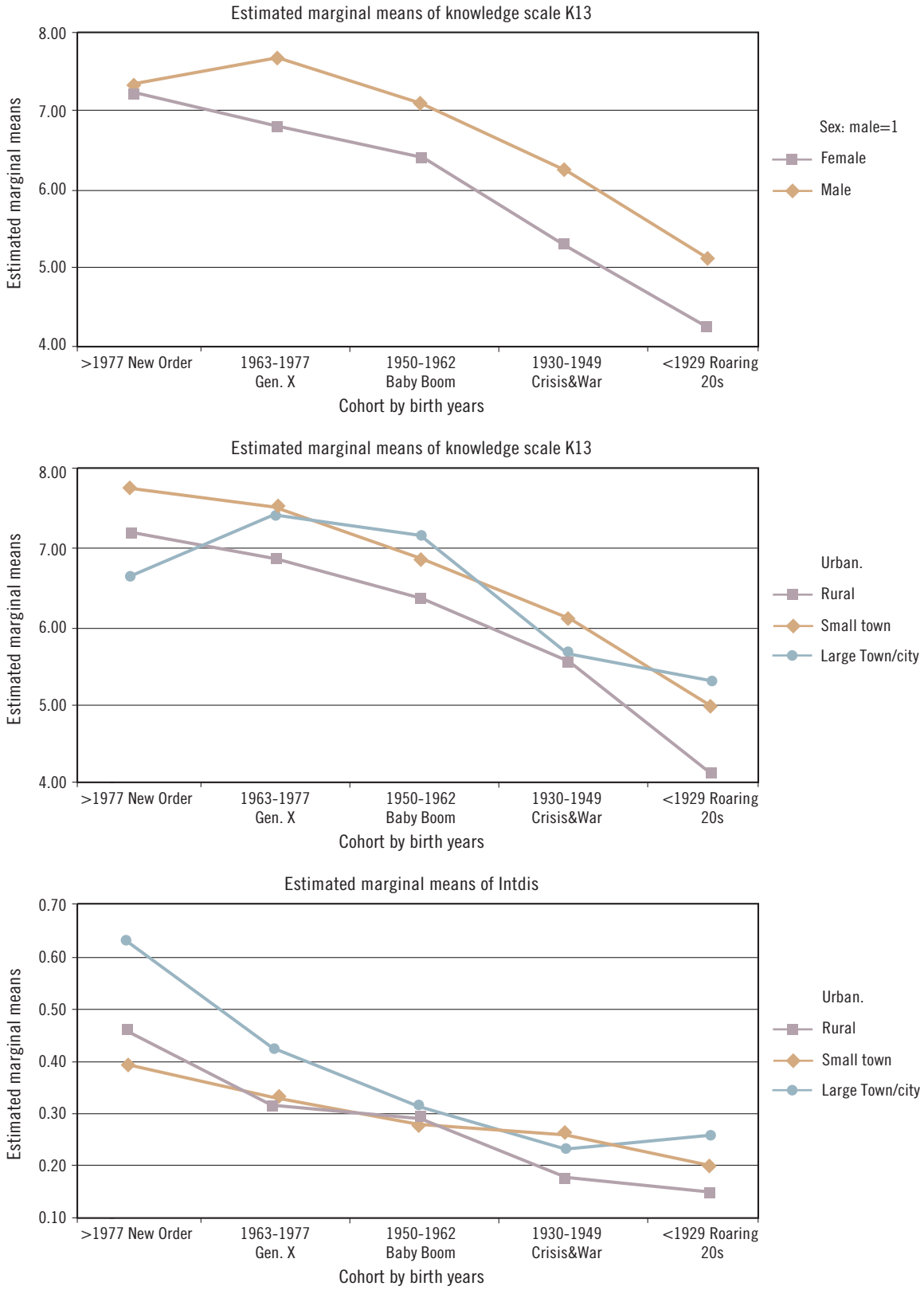

Figure 3.3 ***(cont.)*** Knowledge and interest in relation to level of education, sex and urban or rural dwelling. Figures show MANOVA model estimated marginal means after controlling for level of education and year of survey

similar standing, this is no longer the case in the most recent generation. Female emancipation has reached science literacy among young Spaniards.

The lower two panels of Figure 3.3 show two further facets of this generational story in Spain. Knowledge increases from the oldest cohort but reaches a peak with the Baby Boom generation; and the younger generations are less knowledgeable. Considering knowledge across the generations in relation to location of dwelling, we observe a slip in this improvement among the young urban dwellers, who are less knowledgeable. Young rural and mid-town Spaniards out-perform the city dwellers in their science literacy. Another difference between urban and rural dwelling comes into focus on the question of interest in science. City dwellers among the younger generations are generally more interested in science than their compatriots outside the large cities. This points towards a complex relation between generations, urban dwelling, knowledge and interest in science. Higher knowledge does not necessarily go together with being young and with more interest in science; at least in large cities the simple linearity between these variables seems to break down.

Finally, we look at the seven indicators as they combine into the three structural dimensions of attention, enculturation and cultural progressivism. Figure 3.4 shows the net effects of generational cohorts and level of education, after controlling for year and sex. We observe generally more attention across the generations, but more so for primary educated and tertiary educated Spaniards than for the secondary educated. In the youngest generation, attention to science is mainly a matter of those in primary, or with primary education, and those at University. Secondary schooling does not create this level of attention for the youngest. The education gap for attention to science remains constant, while the order is changing.

The index of enculturation similarly shows an overall improvement, but a very different pattern across levels of education. Among Spaniards with higher education, the Baby Boom generation is the most enculturated into modern science, more so than subsequent cohorts. Among those in primary and secondary education, enculturation in modern science has clearly improved across the generations and the education gap has become smaller.

Finally, cultural progressivism is clearly more prevalent across the generations for those with only primary or with secondary education. For the highly educated Spaniards, the situation

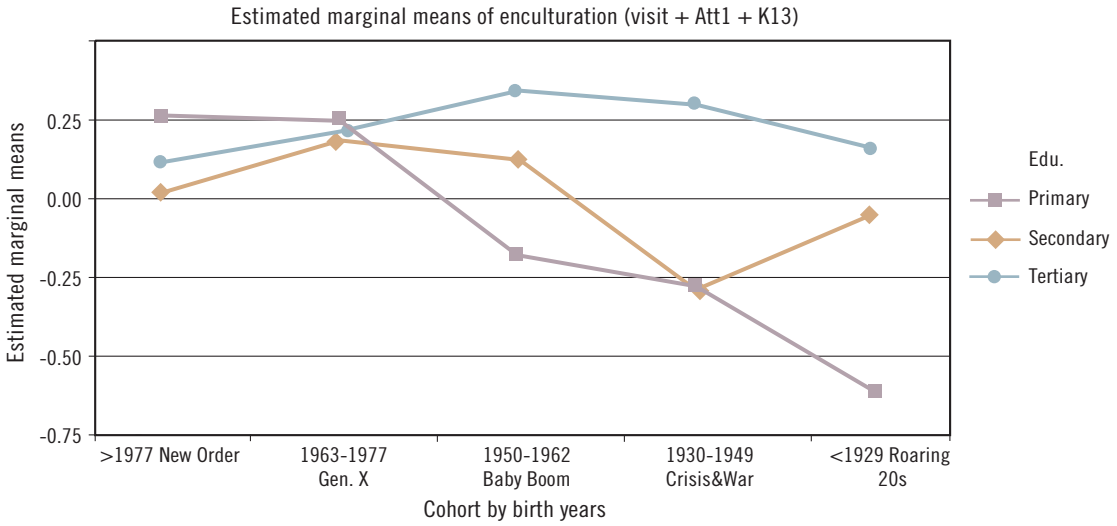

Figure 3.4 Enculturation and cultural progressivism in relation to generational cohorts and level of education, controlling for year and sex

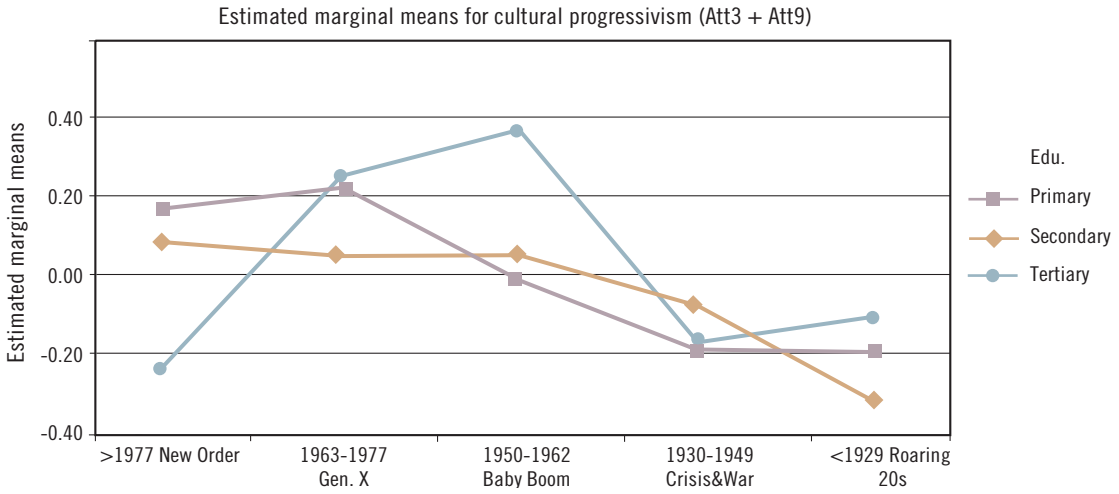

Figure 3.4 ***(cont.)*** Enculturation and cultural progressivism in relation to generational cohorts and level of education, controlling for year and sex

is changing again with the most recent cohort. Compared to the Baby Boom and Generation X, who carried this cultural progressivism, the youngest generation of Spaniards is far less inclined to this view of things, apparently becoming more religious and conservative again.

4
Scientific Culture Across Spanish Regions

Collating the Eurobarometer results from 1989, 1992, 2001 and 2005, in the seven main regions of Spain, as shown in Table A.3.1 Appendix 5, the following regional variations can be observed:

4.1. INTEREST, INFORMEDNESS AND ENGAGEMENT WITH SCIENCE

In all regions, the highest proportion of the sample shows moderate interest in new medical discovery (48 to 50 percent of the participants) and new technology (41 to 50 percent). New scientific discovery, however, appears less interesting, with up to 41 percent of participants in the Centre and the South reporting they are not at all interested. Madrid and the Canary Islands show the highest levels of interest in science and technology overall.

Madrid and the Canary Islands also report the highest levels of informedness out of all the regions. For example, those reporting they feel very well and moderately well informed about new technology, combined total 65 percent and 54 percent respectively. In comparison, levels of informedness in the Northwest are 40 percent, in the North-east are 48 percent, in the Centre 47 percent, in the East 51 percent and in the South 44 percent. In several cases, those who feel poorly informed outnumber the rest (the Northwest and the South for new medical discovery, new technology and scientific discovery).

When looking at the proxy measure for engagement, visits to cultural centres, the majority of Spaniards have never visited any of the centres asked about—art museum, library, zoo/aquarium, natural history museum or science/technology museum. The least visited are the latter two, with up to 88 and 87 percent in the South saying they have never visited these. Madrid and the Canaries again fare better than the other regions, although the Canarians visit zoos/aquariums as little as the rest of Spain outside Madrid. Admittedly, for Canarians, who already live on a major island natural resort, a visit to a zoo or aquarium might have little attraction.

4.2. SCIENCE LITERACY, TEXTBOOK KNOWLEDGE AND IMAGES OF SCIENCE

The kind of things Spaniards know seems regionally diverse. For some items, knowledge levels are similar countrywide *(electrons:* mean 42 percent; *lasers:* mean 28 percent; *human beings:* mean 70 percent). For others, the Canary Islands outpace the other regions *(gene deciding sex:* 57 percent of Canarians answer correctly, compared to the mean 43 percent; *antibiotics:* 55 percent of Canarians answer correctly, compared to the mean 45 percent). For the items *oxygen*, *radioactive milk* and *earth movement-sun*, the Centre and the South lag behind the other regions; for *centre of earth* and *continents moving* the Centre lags behind. For the item *earth movement–time* the South lags. For the items *earliest humans* and *radioactivity* Madrid respondents score more highly than those in the other regions.

When asked how scientific a series of topics are, the overall ranking of those pursuits (scientific to

not scientific) across Spain is: medicine, physics, biology, astronomy, mathematics, psychology, homeopathy, astrology, economics and finally history. Of these, mathematics, psychology and astrology produce regional variation and some respondents might have confused astronomy and astrology (Allum and Stoneman 2011). 84 percent of respondents from the Northeast think mathematics is scientific, compared to 65 percent of those from the Centre of Spain. A larger proportion of Canarians believe psychology to be scientific (76 percent) than Southern respondents (57 percent). 62 percent of Canarians also believe astrology to be scientific, compared to 47 percent of respondents in Madrid.

Methodological knowledge also shows discrepancies between regions. On understanding experimental testing, the proportion answering correctly across the regions is 44 percent. Around half the respondents answer correctly in the Northwest and Madrid, while in the South, 34 percent answer correctly. For the item on probability, 45 percent of respondents from the Centre of Spain answer correctly, compared to 68 percent of Madrid dwellers, while on average 59 percent of Spaniards identify the correct answer.

4.3. ATTITUDE FACETS

Again, it is clear looking at the data split by region that the attitude items are multidimensional. There are few similarities between distributions for these items. The only item about which the regions closely agree is: "science makes our way of life change too fast." Those who agree strongly, or to some extent with this, range between 67 (Northwest) and 74 (Northeast and Madrid) percent.

Looking at the other attitude items, Canarians are more likely than Spaniards in the other regions to agree that science and technology make work more interesting, and will provide opportunities for future generations. More Northeasterners agree that "science and technology are making our lives healthier, easier and more comfortable" (77 percent), and disagree that "scientific and technological research cannot play an important role in protecting the environment and repairing it" (61 percent). They also are less likely than the other regions to agree that "because of their knowledge, scientific researchers have a power that makes them dangerous" (44 percent). Meanwhile, Northwesterners are less likely to agree than the other regions that "we depend too much on science and not enough on faith" (40 percent compared to the mean regional agreement of 50 percent).

When it comes to animal testing, the East is the region holding the most passionate views against (17.3 percent strongly disagree that "scientists should be allowed to undertake research that causes pain and injury to animals like dogs and chimpanzees if it can produce information about human health problems"), while 63 percent of respondents in central Spain agree with this item. The Eastern region is also the one where respondents are most likely to disagree that "thanks to scientific and technological advances the earth's natural resources will be inexhaustible" (57 percent compared to the national average agreement of 51 percent).

For the item "for me, in my daily life, it is not important to know about science," national disagreement is 48 percent, with Madrid respondents disagreeing the most (52 percent) and Southerners the least (41 percent).

4.4. EU SCIENCE COMPARED TO USA

When asked about the perception of the EU's activity levels in energy, science and technology, the environment and defence, across all regions, the majority of Spanish respondents (63 to 82 percent) perceive the EU as inactive. The Northeast, East and Madrid are consistently the top three in terms of perception of inactivity. Across the regions, Spaniards are more ambivalent about the level of EU activity in agriculture. The Canaries (66 percent), Centre (57 percent) and the Northwest (55 percent) are more likely to perceive the EU as inactive. Madrid dwellers and the South are approximately split down the middle, and the Northeast (54 percent) and the East (53 percent) are slightly more likely to consider the EU active in this area.

When asked to consider what level Europe is achieving compared to the USA in scientific discovery, industry and technology and life technology, Spaniards in all regions consider Europe to be behind. Canarian respondents are less pessimistic, with 10 to 20 percent fewer Canarians believing Europe is behind the USA in these matters.

To be expected, the majority of Spaniards in all regions describe themselves as Roman Catholic. There are slightly larger proportions of those to whom religion is not applicable or who do not know their religious beliefs in Madrid, the East and the Canary islands. Type of community, of course, varies between regions. The Centre is the most rural; Madrid the most urban. As in other Eurobarometer groups, there is a preponderance of those who might be at home when the researcher comes to call (retired, houseperson, student, or the unemployed). The mean age across regions ranges from 39 (in the Canaries) to 46 (in the Northwest). Madrid and the Canaries have the participants with the most years of education, the South with the least. The majority of the participants are married, except for in the Canaries (38 percent single, 47 percent married). The survey is stratified to evenly represent the sexes.

Table 4.1 below shows the average level of knowledge by year and region. Regions are ordered by overall level of knowledge. Madrid, the Canaries, and the East are the more scientifically knowledgeable. The Northwest, South and Centre of Spain are the least. Over time, it seems that this rank ordering is changing. The Spanish regions have a slightly different dynamic when it comes to scientific culture. Madrid remains in lead position already held in 1989. The Northwest has improved its position from rank 6 in 1989 to rank 3 in 2005, while the South has lost position from 4th in 1989 to 7th in 2005. Equally, the Northeast lost ground from 2nd to 4th/5th position. Both the Northwest and the Centre have improved their knowledge score by close to one standard deviation, while the South improved the least over this period. The effect size for year (Eta2 = 0.054) is larger than that of region (Eta2 = 0.011).

TABLE 4.1: Average knowledge (K13) by region and year: rankings and z-values

	Rank	1989	1992	2001	Rank	2005	All
Region of Madrid	1	6.16	7.02	6.07	1.0	8.40	6.94
Canaries	5	5.44	7.64	6.24	4.5	7.40	6.80
East	3	5.78	6.50	7.07	2.0	7.71	6.77
Northeast	2	6.02	6.60	6.87	4.5	7.41	6.70
Northwest	6	4.82	7.35	6.68	3.0	7.47	6.52
South	4	5.59	5.93	6.79	7.0	6.26	6.16
Centre	7	4.53	5.87	7.30	6.0	6.85	6.14
Average	---	5.53	6.51	6.82	---	7.33	6.55
Z-values: Spanish mean = 0, SD = 1							
	1989	**1992**	**2001**	**2005**	**All**	**Z-change**	
Region of Madrid	-0.14	0.16	-0.17	0.65	0.14	0.79	
East	-0.27	-0.02	0.18	0.41	0.08	0.68	
Northwest	-0.61	0.28	0.04	0.32	-0.01	0.93	
Northeast	-0.19	0.01	0.11	0.30	0.05	0.49	
Canaries	-0.39	0.38	-0.11	0.30	0.08	0.69	
Centre	-0.71	-0.24	0.26	0.10	-0.14	0.82	
South	-0.34	-0.22	0.08	-0.10	-0.14	0.24	
Total	**-0.36**	**-0.02**	**0.09**	**0.27**	**0.00**	**0.64**	

Another feature that varies across regions is the relation between various indicators and level of knowledge at the individual level. Table 4.2 shows partial correlations of knowledge with various indicators for different Spanish regions controlling for education and urban or rural dwelling. This shows that not only are the basic observations different across region but also the relations between these observations. So for example, the correlation between knowledge and attitude facets is strongest in the Northwest. The gender gap is largest in the Northeast, East and Canaries. Knowledge and interest in science form a close complex in the Centre, in Madrid, the South and the Canaries, but less so in the Northwest, Northeast and East. The effect of age cohort is generally strong, and stronger than the pure age effect, and but particularly so in the Northwest, Centre, South and Canaries and all this after controlling for education and urban or rural dwelling. The improvement of science literacy over the years is most in evidence in the Northwest, Centre and East of the country.

TABLE 4.2: Partial correlations of items with knowledge after controlling for education and urban/rural dwelling

	Intdis	Att1 Healthier	Att3 Not on faith	Att9 Life too fast	Sex: Male = 1	Age cohort	Age	Year
Northwest	0.19	**0.15**	**0.16**	**-0.06**	0.14	**-0.42**	-0.38	**0.23**
Northeast	0.23	0.09	0.12	-0.03	**0.19**	-0.35	-0.35	0.12
Region of Madrid	**0.26**	**0.19**	**0.18**	-0.02	0.14	-0.33	-0.31	0.18
Centre	**0.25**	**0.14**	0.03	**-0.06**	0.14	-0.44	-0.36	0.28
East	0.17	0.08	0.11	0.03	**0.17**	-0.40	-0.36	**0.23**
South	0.28	0.09	0.10	**-0.11**	0.13	**-0.40**	-0.40	0.10
Canaries	**0.29**	**0.23**	0.04	-0.05	**0.19**	**-0.41**	-0.39	0.13
Spain	**0.23**	0.13	0.11	-0.04	0.15	-0.39	-0.36	0.19

5
An integrated Model of Public Understanding of Science in Spain

Looking at relations between variables is often revealing. We can ask how strong the relationship is between age cohorts and scientific knowledge in Spain. But any pairwise comparison misses out on the problem that associations of between any two variables can depend on other variables as well. This problem of confounding variables can be controlled by modelling several variables in a single model. For this purpose, we use a logistic regression on a binary outcome. Logistic regression makes less assumptions on the property of the dependent variable, providing results that can be interpreted as lower or higher *odds*—often interpreted as *relative risk* in the case of a negative outcome—, of falling into a defined category.

Table 5.1 compares five such models for knowledge, attitudes and interest in science. The binary variables are high and low knowledge—the cut off point is getting 60 percent of items correct, which corresponds to a median split at mark 7 on a scale of 0 to 13—; for attitude, the cut-off point is below or above 0 (range -2 to +2), and interest is already a binary variable of interest or no interest in science. As predictors, the models include the variables already explored above: age cohort, level of education, year of survey wave, sex, secularism (i.e. religiousness now as predictor), region, and biological age within the cohort.

We can observe the following relation between these variables. Compared to Spaniards born in the 1920s, the youngest generation is five times (+556 percent) more likely to fall into the high knowledge category. The cohort gradient is linear; scientific literacy is clearly related to the generation's experience of education and their geo-political context. Compared to those with university education, primary and secondary educated Spaniards are around 50 percent less likely to be highly knowledgeable. Over the years since 1989, there is a significant gradient of improvement. In years previous to 2005, Spaniards are 50 percent less likely to fall into the knowledgeable category, everything else being equal. Women are 43 percent less likely to be considered knowledgeable. Religiosity or secularism is interesting. The secular Spaniards are more knowledgeable than the religious ones, but the agnostic or non-declared ones are least knowledgeable everything else being equal. This seems to indicate that it is not necessarily a religious outlook per se that militates against a less scientific outlook in life. In terms of Spanish regions, the Northwest and the East are advantaged compared to the Canaries when it comes to science literacy. Table 4.1 showed the Canaries in a more favourable position; however, here we have controlled for age cohort which considers the fact that the population on the Canaries tends to be younger than elsewhere in Spain.

Now let us consider attitudes, in particular the expectation of welfare improvements. Here we have two models to consider: one without and the other with levels of knowledge included among the predictors.

For attitudes in terms of harbouring positive expectations from science for health, comfort and ease in life, New Order and Generation X feel more positive than the other three age cohorts. Also, education makes a difference. Everything else being equal, those with only primary or

TABLE 5.1: A binary logistic regression of high knowledge, positive attitudes and interest in science

	Odds ratios: the relative *risk* of falling into high category				
	Model I	**Model II**	**Model III**	**Model IV**	**Model V**
	Know.	**Att1_health**	**Att1_health**	**Int_dis**	**Int_dis**
New Order	**556**	**94**	**50**	**272**	**128**
Gen. X	**381**	**56**		**133**	**50**
Baby Boomer	**256**			**99**	**39**
Crisis&War	**85**				
Roaring 20s (ref)					
Primary education	-67	-36		-47	-31
Secondary education	-54	-33		-43	-32
Tertiary educ. (ref)					
1989	-71	-45	-34		
1992	-50			**90**	**136**
2001	-53	-42	-37		
2005 (ref)					
Female	-43	-21	-15	-18	
Male (ref)					
Not religious	**55**				
DK/NA	-27	-60	-57	-39	-31
Religious (ref)					
Northwest	**33**				-36
Northeast		**82**	**74**		
Madrid					
Centre				-39	-40
East	**52**			-31	-37
South				-47	-48
Canaries (ref)					
Knowledge (0-13)			**10**		**22**
Nagelkerke	0.25	0.107	1.2	0.126	1.73
Percent Change	8.2	0.14	0.2	0.6	0.13
Significance $p < 0.10$					

secondary education are about 30 percent less likely to exhibit positive expectations for science. For unclear reasons, 1989 and 2001 were more negative years, while 1992 does not differ from 2005. This shows again that there is no clear trend on this indicator in Spain. Expectations towards science fluctuate but do not improve or decline over our period of observation. The Northeast, including the Basque Country, Navarre, Rioja and Aragon, is the only region with a significantly higher *risk* of positive attitudes compared to the Canaries; all other regions are the same in that respect, controlling for all other influences.

As consistently observed, women are more sceptical when assessing the outcomes of science, probably in particular with respect to health. After controlling for education, age cohort, year and regions, Spanish women are 20 percent less likely to harbour positive expectations than men. A similar *risk* for negative expectations arises

from being neither clearly secular nor clearly religious in one outlook in life. Such people have 60 percent less likelihood of being positive compared to religious Spaniards, while the secular and the religious do not differ in that respect.

Considering a possible positive association between knowledge and attitudes, which is widely discussed in the literature on public understanding of science, we also test model III, which is the same as model II, but includes knowledge as a predictor. The results show that knowledge makes an independent contribution to positive expectations for science, and an increase in one point on the knowledge score can expect to yield a 10 percent increase in the likelihood for a positive attitude. Controlling for knowledge, effect of education on positive attitudes disappears, and the effect of age cohorts is weakened. It seems to be a genuine knowledge of science which relates to positive attitudes, independent of education or age group. Those who are enculturated into science also harbour positive expectations. It remains unclear whether knowledge drives this attitude, or whether positive attitudes drive the acquisition of new knowledge. What can expect is that positive attitudes that are based on knowledge are probably more stable and resistant to change in circumstance.

Positive expectations of science are in Spain thus mainly a matter of knowledge, sex and falling in between the secular-regional split of the country.

Predicators are age cohorts, level of education, year, sex, religiosity and region (and level of knowledge). Missing values in the table denote differences to the reference category that are not statistically significant ($p < 0.10$). Figures show the odd changes: odds change = 100 {exp(B) - 1}.

We can undertake a similar analysis of the issue of interest in new scientific discoveries (model IV). Again, the generation effect on interest is the strongest: the three generations after the Baby Boomers show higher interest in science than older age cohorts. The gradient is less steep than for knowledge, but steeper than for attitudes. Again tertiary education makes a difference. Spaniards without a university education have about a 40 percent *risk* of low or no interest in science compared to those with tertiary education. Women are generally less interested, as are those that fall outside the religious-secular split in the country. In terms of regions, the Centre, East and South are less interested than the Canaries. Looking at the years when observations were made, 1992 is clearly a year when interest in science was marked, confirming the coming and going of interest in science as observed above, after controlling for other influences.

Model V brings knowledge into the equation. Knowledge is a clear predictor of interest in science, but again it remains open whether knowledge drives interest, or whether interest drives the acquisition of new knowledge. When considering knowledge, most other associations remain intact. However, controlling for knowledge, the year effect of 1992 increases to 136 percent and the gender difference disappears.

Interest in science in Spain is thus mainly a matter of being of the younger generation, tertiary educated, with science knowledge acquired therein, and higher in the early 1990s than any time before or after.

Considering the relative importance of the three sources of variation of PUS in Spain—year, generational cohort and region—, the model indicates that all these sources of variation contribute to the variation of scientific culture in Spain. But their relative influence is different for different key indicators. Table 5.2 shows the hierarchy of relative importance for these three influences on our key indicators. For three indicators, generational influences are the most important ones, while for five others the annual change is larger than the generational variation. For two indicators, the influence of year and cohort is on the same level. Overall, region is a lesser source of variation in science culture, considering the other two influences. Effect sizes are generally rather low (see Appendix: Table A.3.5). Partial Eta2 for any of these indicators in relation to year, cohort or region controlling for sex and education varies between 0.004 and 0.186. The larger effect sizes are between knowledge and cohort (Eta2 = 0.144), between informedness and year (Eta = 0.186), and between enculturation and year (Eta2 = 0.155). All other effect sizes are below 10 percent; Eta2 < 0.1.

TABLE 5.2: The relative importance of year, cohort and region for different indicators	
Knowledge	Cohort >> year > region
Secularism (Att3)	Cohort > year > region
Cultural progressivism (Att3 + Att9)	**Cohort > year = region**
Interest (Intdis)	Cohort ~ year > region
Progressivism (Att9)	Cohort~ year ~ region
Informedness (Infodis)	Year >> cohort >> region
Enculturation (K13 + Sciact + Att1)	**Year >> cohort > region**
Engagement (Sciact)	Year > cohort > region
Attention (K13 + Infodis + Intdis)	**Year > cohort > region**
Welfare expectation (Att1)	Year > cohort ~ region

Conclusion

In the present report we have made a first attempt to characterise the dynamics of general scientific culture in Spain on the basis of four Eurobarometer surveys conducted in 1989, 1992, 2001 and 2005.

We have undertaken this task in several steps. Starting by describing the basic results, we defined several key indicators of scientific culture: knowledge; interest and informedness about science; three facets of attitudes which are welfare expectations, secularism and progressivism; and engagement with science which is manifested in visits to science museums or zoos. And finally, we considered an indicator of general confidence, which shows the perceived lag between European and US science and technology developments.

Structural analysis showed that these indicators combine into three indices: attention to science, enculturation with modern science and cultural progressivism.

We then presented results that arise if we compare Spain to the rest of Europe on these indicators, and how much these indicators have changed from 1989 to 2005. A second comparison focused on the generational cohorts and how these compare on these indicators. These analyses show that there are significant interaction effects between these influences in and above their main effects. Finally, we compared Spanish regions. An integrated model brings together all these influences into a comparative picture which allows us to determine the most significant influence of them all, which varies depending on the index.

From all this, a complex picture of modern Spanish science culture and its correlates emerges. Much remains in the dark when it comes to explanations for which further detailed and contextual studies may be required. But this report is clearly a first step in the right direction: considering the available data.

Appendix 1
Overall Database Information

The Eurobarometer surveys started in the early seventies as an instrument to monitor attitudes to European integration. These surveys are conducted on the behalf of the European Commission at least two times a year in all member states of the EU. They provide regular monitoring of the social and political attitudes of the European public. Among other things on four rounds, the general attitudes to science and technology have been investigated. Other surveys investigated specific issues such as nuclear power, biotechnology, environment and information technology.

Eurobarometer 31 was a pre-election survey focusing on various issues related to European elections conducted during March-April, 1989. Questions on political party preferences, usage of media, perceptions about important issues/ problems, views on environmental issues like nuclear accidents, radioactivity, knowledge and attitudes about diseases like cancer, etc., were asked. Demographic information like age, sex, education, occupation, family income, religion, etc., was also collected. The sample comprised of population aged 15 years and above. A *two-stage sampling design* was adopted to select the sample. The total sample size in this round was 11,678. It contained both weighted and unweighted national samples.

Eurobarometer 38.1 survey focused on the role played by consumer, science, and entertainment issues. It was conducted during the month of November, 1992. Respondents were asked to describe their attitudes toward science and technology issues: how informed respondents were in general, the sources of their information, opinions as to which subjects were *scientific* and which were not, etcetera. They were also asked about the role the European Community plays in scientific research and how effective Community countries were in the promotion of science and technologies when compared with Japan and the United States. In addition to this, demographic information was also gathered. In this round, also population of age 15 years and above was taken, and a sample of 13,024 persons using *multi-stage sampling design* was selected. A total of eight weights were given in this round: four Nation weights and four European weights.

Eurobarometer 55.2 was carried out by the European research group, a consortium of Market and Public Opinion Research agencies, between May 10th and June 15th, 2001. It covers population aged over 15 years and of European Union member states. A total sample of 16,029 persons was selected using multi-stage random sampling design. In each EU country, a number of *sample points were drawn with probability proportional to population size and density.* Compared to previous surveys, the response options were reduced on most items, mainly for reasons of saving costs. This makes the comparison across the series more difficult.

CC-EB 2002.3 or Candidate Countries Eurobarometer extends the standard Eurobarometer to countries applying for European Union membership. The survey was conducted in the 13 Candidate Countries during the autumn of the year 2002. It is fully comparable with the Standard Eurobarometer of 2001 (EB55.1). Information on citizens' experience and general perception of science and

technology, the levels of information and interest in science, etc., have been collected.

Eurobarometer 63.1 was conducted between January 3rd and February 15th, 2005 with similar goals to the other EU surveys. This survey involved a much larger sample, comprising 25 EU member states, the candidate countries (Bulgaria, Romania, Croatia and Turkey) and the three EFTA countries (Iceland, Norway and Switzerland). The methodology used was also similar to the earlier EU surveys. The main objective of the study was to assess Europeans' general attitude towards science and technology.

The *integrated database* contains all variables that are strictly comparable across the above survey rounds. Variables are grouped into eight categories: technical and weighting variables, interest and information variables, engagement variables, science and technology attitude variables, opinion about different subjects, scientific knowledge variables, demographic variables and variables concerning the role of the EC/EU played in promotion of science and technologies. For the sample sizes per country, see Table A.1.1.

Technical variables are used to identify the Eurobarometer, the nation, or the individual respondent. Weighting variables help to adjust samples to different universes. *Interest and information* variables indicate how interested respondents are about different news items and how confident they feel to opine on them. *Engagement* variables give information for recent visits to zoos, museums, and cultural institutions. *Science and technology* variables describe the attitude towards different science and technology issues. *Opinion* variables tell as to which subjects are *scientific* and which are not. Scientific *knowledge* variables show knowledge of scientific methods of investigation and the importance of science and technology in daily live. *Demographic* variables describe the social position of the respondents, for example their age, sex, marital status, occupation, religion or education. EC/EU variables are the ones referring to questions on the European Community or the *European Union about their role in promotion of science and technologies* when compared with the United States.

A.1.1. SOCIO-DEMOGRAPHIC PROFILE OF SPAIN COMPARED TO THE REST OF THE EU

A quick look at the demographic indicators comparing our samples show that the Spanish

TABLE A.1.1: EU12 Sample distribution 1989 to 2005

	Year				
Country	**1989**	**1992**	**2001**	**2005**	Total
France	1,005	1,008	1,004	1,021	4,038
Belgium	1,002	1,043	1,058	1,024	4,127
Netherlands	1,025	1,022	1,061	1,005	4,113
Germany	1,024	2,032	2,038	1,507	6,601
Italy	1,022	1,021	995	1,006	4,044
Luxembourg	303	500	619	518	1,940
Denmark	1,014	1,000	1,000	1,013	4,027
Ireland	1,006	1,000	1,006	1,008	4,020
United Kingdom	1,276	1,374	1,304	1,307	5,261
Greece	1,000	1,003	1,004	1,000	4,007
Spain	**1,001**	**1,021**	**1,000**	**1,036**	**4,058**
Portugal	1,000	1,000	1,000	1,009	4,009

The maximum *margin of errors* for reported ratio/percentages 0.50 (50 percent) at 95 percent confidence level are according to the following formula [not including the design effect of the sampling rationale which is not made public]: *P +/- 1.96 (0.50/sq root of No.).*

No. = 300: 5.7 percent / No. = 500: 4.3 percent / No. = 1,000: 2.9 percent / No. = 4,000: 1.6 percent / No. = 12,000: 0.9 percent.

sample is 50 percent female and 50 percent male, 60 percent married, are on average in their forties, are rather likely to be a *housewife,* student or retired and are split quite evenly between city, town and country dwellers. On these variables, Spain does not differ from the rest of Europe. However, the rest of Europe has more years of education than Spain, where respondents are also more likely to be either Catholic or of no declared religion.

TABLE A.1.2: Descriptive statistics on the key derived variables in the analysis

	No.	Minimum	Maximum	Mean	Std. deviation
Socio-demographic variables					
Cohort by birth years: high = older	4,058	1	5	3.05	1.25
Edu.	4,058	1	3	1.57	0.76
Age4	4,058	1	4	2.62	1.12
Rural-urban	4,054	1	3	Categorical	
Sex: male = 1	4,058	0	1	0.47	0.50
Denom. yes = 1/no = 0	3,058	0	1	0.18	0.38
Spanish regions	4,058	1,210	1,270	Categorical	
Attitudes: high value = positive attitude					
Att1 more comfort, healthier	3,549	-2	2	0.75	0.98
Att2 resources inexhaustible	2,548	-2	2	-0.36	1.12
Att3 not enough on faith	3,549	-2	2	-0.32	1.14
Att4 no role to save environment	2,548	-2	2	0.33	1.15
Att5 allowed to do animal exp	2,548	-2	2	0.14	1.26
Att6 scientists are dangerous	2,530	-2	2	-0.24	1.14
Att7 work more interesting	2,530	-2	2	0.51	1.01
Att8 not important for daily life	2,530	-2	2	0.16	1.25
Att9 life changes too fast	3,531	-2	2	-0.77	0.97
Att10 opportunities for future generation	2,530	-2	2	0.66	1.02
Binary: more comfort, health	3,549	0	1	0.70	0.46
Relig.: depend not enough on faith	3,549	-1	1	0.25	0.83
Engagement activities: high value means more engagement					
Scimus	4,058	0	1	0.16	0.37
Zoo	4,058	0	1	0.25	0.46
Nathist	2,022	0	1	0.17	0.38
Library	3,057	0	1	0.27	0.45
Art	3,057	0	1	0.23	0.42
Sciact = scimus + zoo	4,058	0	2	0.41	0.64
Cultact = library + art	3,057	0	2	0.50	0.72
Cult = cultact + sciact	3,057	0	4	0.88	1.15

TABLE A.1.2 *(cont.):* Descriptive statistics on the key derived variables in the analysis

	No.	Minimum	Maximum	Mean	Std. deviation
Interest in science and other areas					
Intmed	3,058	0	1	0.29	0.45
Intinven	3,058	0	1	0.26	0.44
Intdis	**4,058**	**0**	**1**	**0.27**	**0.45**
Intsport	4,058	0	1	0.31	0.46
Intpolit	4,058	0	1	0.19	0.39
Intall	4,058	0	3	0.77	0.88
Informedness about science and other issues					
Infomed	3,058	0	1	0.07	0.26
Infoven	3,058	0	1	0.07	0.26
Infodis	4,058	0	1	0.16	0.36
Infospo	4,058	0	1	0.29	0.45
Infopol	4,058	0	1	0.16	0.37
Infoall	4,058	0	3	0.61	0.84
Rivalry EU-USA (high value = EU is lagging behind)					
Rival_dis	3,058	0	1	0.65	0.48
Rival_ind	3,058	0	1	0.61	0.49
Rival_biotech	3,058	0	1	0.57	0.49
Rival	3,058	0	3	1.84	1.26
Knowledge and science literacy levels					
K binary	4,058	0	1	0.40	0.49
Gene probability	3,022	0	1	0.60	0.49
Drug experiment	2,021	0	1	0.58	0.49
Meth = experi+probab	2,021	0	2	1.22	0.77
Knowledge scale k13	4,058	0	13	6.55	2.84
Knowledge 5 levels	4,058	1	5	2.65	1.24
Valid No. (listwise)	1,018				

Appendix 2
Basic Information on Spain

TABLE A.2.1a: Observations in each region for each survey year					
	EB 31	**EB 38.1**	**EB 55.2**	**EB 63.1**	**Total**
Northwest	130	110	112	116	468
Northeast	124	109	105	111	449
Region of Madrid	126	133	127	136	522
Centre	129	137	136	126	528
East	279	280	273	290	1,122
South	181	213	209	205	808
Canaries	32	39	38	52	161
Total	**1,001**	**1,021**	**1,000**	**1,036**	**4,058**

TABLE A.2.1b: Age cohorts for each survey round					
Age cohort	**1989**	**1992**	**2001**	**2005**	**Total**
>1977 New Order	0	0	209	232	441
1963-1977 Gen. X	264	345	276	270	1,155
1950-1962 Baby Boom	256	212	178	195	841
1930-1949 Crisis&War	234	272	248	256	1,010
<1929 Roaring 20s	247	192	89	83	611
Total	**1,001**	**1,021**	**1,000**	**1,036**	**4,058**

TABLE A.2.2: Cross-tabulation between religiosity (Att3) and espoused denomination

			Att 3: Relig.: depend not enough on faith			
			Not relig.	DK	Relig.	Total
Denom. yes/no	Yes	Percent within denom. yes/no	18.3	27.7	**54.0**	100.0
		Percent within relig.: depend not enough on faith	68.6	84.0	**88.4**	82.8
		Percent of total	15.2	22.9	44.7	82.8
	No	Percent within denom. yes/no	**40.4**	25.3	34.2	100.0
		Percent within relig.: depend not enough on faith	**31.4**	16.0	11.6	17.2
		Percent of total	6.9	4.4	5.9	17.2
	Total	Percent within denom. yes/no	22.1	27.3	50.6	100.0
		Percent within relig.: depend not enough on faith	100.0	100.0	100.0	100.0
		Percent of total	22.1	27.3	50.6	100.0

Chi-sq = 1.08 p < 0.001 ; Phi = 0.206; n = 1,509 [denomination is not asked in 2001; 2005 split half].

Appendix 3
Relations Structure of Key Variables

TABLE A.3.1: The reliability of the knowledge indicators K13 for Spain

Mean	Variance	Std. deviation	No. of items	Cronbach's Alpha
6.55	8.08	2.84	13	**0.71**

	Scale mean if item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's Alpha if item deleted
1 earth	5.75	7.03	0.42	0.68
2 oxygen	5.82	7.55	0.14	0.72
3 electron.	6.14	6.73	0.43	0.68
4 contin.	5.83	6.70	0.51	0.67
5 sexgene.	6.13	7.22	0.23	0.71
6 evolution	5.86	7.04	0.34	0.69
7 sunearth	6.37	8.15	-0.10	**0.74**
8 suntime	5.94	6.87	0.38	0.69
8 radmilk	6.04	6.78	0.40	0.68
9 laser	6.27	6.99	0.37	0.69
10 radioact.	6.11	6.72	0.43	0.68
11 antibio.	6.28	7.03	0.36	0.69
12 dinosaur	6.10	6.82	0.39	0.69

TABLE A.3.2: Principal component analysis of key indicators

	Component		
	Attention to science	Science enculturation	Cultural progressivism
Infodis	0.84		
Intdis	0.75		
Att1 more comfort, healthier		0.70	
Sciact = scimus + zoo		0.65	
Knowledge scale K13	0.44	0.51	
Att3 not enough on faith			0.77
Att9 life changes too fast			0.75

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

A principal component factor analysis of the seven key indicators as shown in the table above was conducted. The initial solution was rotated with VARIMAX and Kaiser Normalisation. Missing values were substituted by the overall mean. The resulting three-factor solution explains 57 percent of the total variance. Factor values are kept as new values for these three combined indicators: attention to science, enculturation in science, and cultural progressivism. The distributions of the three combined indices are shown below as bar charts. Attention is heavily skewed towards inattention, enculturation is fairly normally distributed, and cultural progressivism shows a bi-modal distribution.

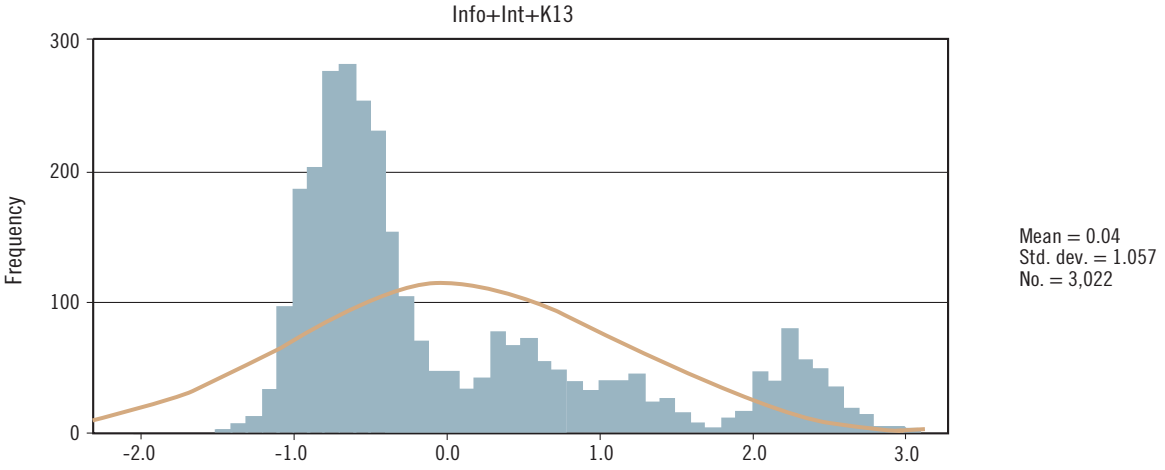

Figure A.3.1 Attention to science: Intdis + Infodis + K13

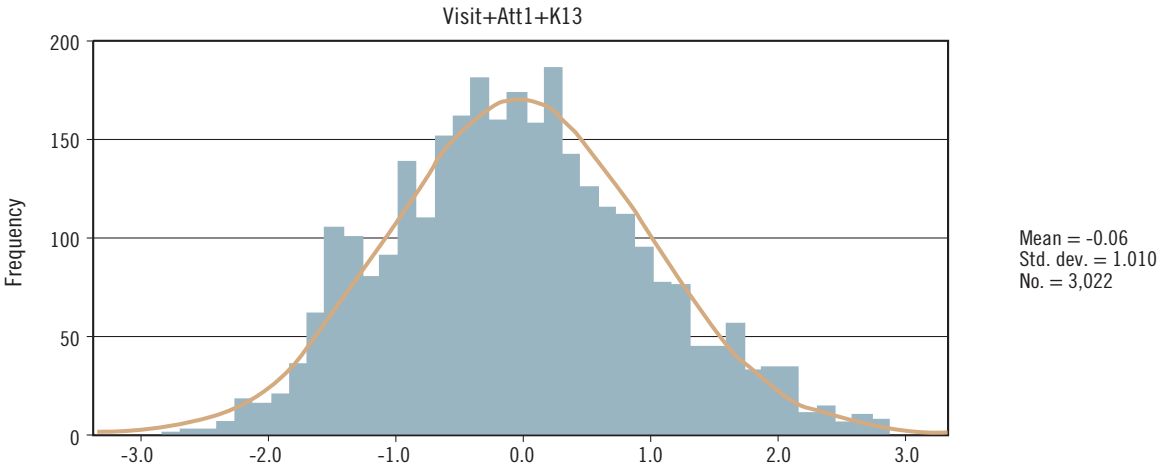

Figure A.3.2 Enculturation in modern science: K13 + Sciact + Att1

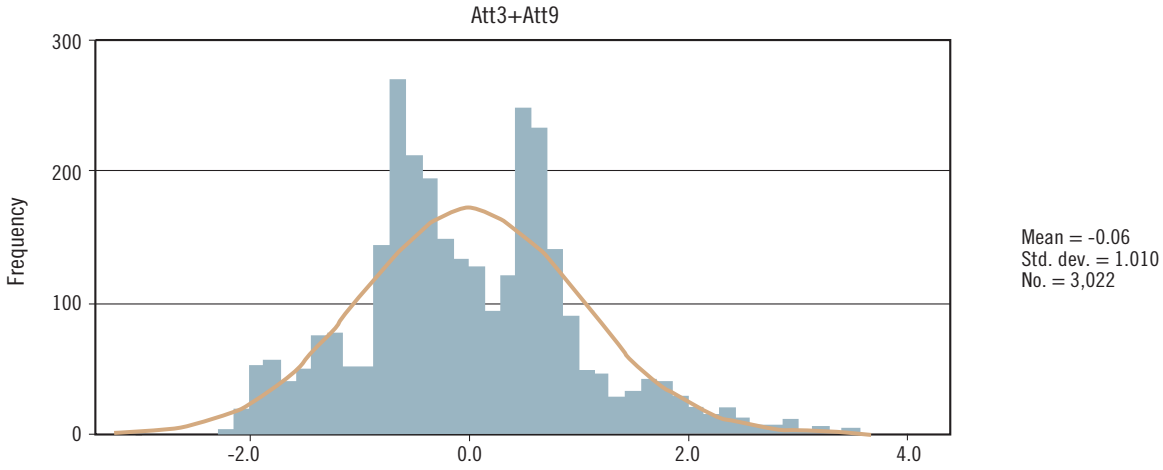

Figure A.3.3 Cultural progressivism: Att3 (secularism) + Att9 (speed of progress)

TABLE A.3.3: Correlation between key indicators and remaining attitude facets

		Att2 resources inexhaustible	Att4 no role to save environment	Att5 allowed to do animal exp.	Att6 scientists are dangerous	Att8 not important for daily life	Att10 opportunities for future generation
Att1 more comfort, healthier	r	0.170	0.040	0.090	0.020	0.160	0.290
	p	0.001	0.030	0.001	0.290	0.001	0.001
	n	2,548	2,548	2,548	2,021	2,021	2,021
Att3 not enough on faith	r	-0.170	0.120	-0.070	0.120	0.130	0.010
	p	0.001	0.001	0.001	0.001	0.001	0.720
	n	2,548	2,548	2,548	2,021	2,021	2,021
Att9 life changes too fast	r	0.020	-0.010	-0.030	0.180	0.080	-0.100
	p	0.310	0.710	0.240	0.000	0.000	0.000
	n	2,021	2,021	2,021	2,530	2,530	2,530
Knowledge scale K13	r	-0.180	0.160	0.060	0.070	0.300	0.120
	p	0.001	0.001	0.001	0.001	0.001	0.001
	n	2,548	2,548	2,548	2,530	2,530	2,530
Intdis	r	-0.060	0.140	0.020	0.040	0.270	0.110
	p	0.001	0.001	0.390	0.06	0.001	0.001
	n	2,548	2,548	2,548	2,530	2,530	2,530
Infodis	r	-0.030	0.040	0.070	0.010	0.100	0.030
	p	0.150	0.070	0.001	0.590	0.001	0.210
	n	2,548	2,548	2,548	2,530	2,530	2,530
Sciact = scimus + zoo	r	-0.080	0.100	-0.020	0.050	0.240	0.070
	p	0.001	0.001	0.220	0.010	0.001	0.000
	n	2,548	2,548	2,548	2,530	2,530	2,530

TABLE A.3.4: Correlations between main indicators and other items

		Rival	Drug experiment	Gene probability	Meth. = experi. + probab.	Denom. yes/no
Att1 more comfort, healthier	r	0.090	0.050	0.030	0.030	-0.030
	p	0.001	0.040	0.120	0.170	0.160
	n	2,549	2,021	3,022	2,021	2,549
Att3 not enough on faith	r	-0.030	0.080	0.090	0.110	0.190
	p	0.120	0.001	0.001	0.001	0.001
	n	2,549	2,021	3,022	2,021	2,549
Att9 life changes too fast	r	-0.070	0.000	-0.030	-0.020	0.020
	p	0.001	0.840	0.140	0.490	0.390
	n	2,531	2,021	3,022	2,021	2,531
Knowledge scale K13	r	0.200	0.270	0.380	0.370	0.240
	p	0.001	0.001	0.001	0.001	0.001
	n	3,058	2,021	3,022	2,021	3,058
Intdis	r	0.100	0.130	0.170	0.180	0.060
	p	0.001	0.001	0.001	0.001	0.001
	n	3,058	2,021	3,022	2,021	3,058
Infodis	r	0.030	0.090	0.160	0.150	0.040
	p	0.09	0.001	0.001	0.001	0.030
	n	3,058	2,021	3,022	2,021	3,058
Sciact = scimus + zoo	r	0.050	0.060	0.140	0.110	0.080
	p	0.010	0.010	0.001	0.001	0.001
	n	3,058	2,021	3,022	2,021	3,058

TABLE A.3.5: Correlations of key indicators with main predictors

		Cohort by birth years	Age4	Year	Sex: male = 1	Urban
Att1 more comfort, healthier	r	-0.040	-0.070	-0.070	0.050	0.000
	p	0.010	0.001	0.001	0.010	0.900
	n	3,549	3,549	3,549	3,549	3,545
Att3 not enough on faith	r	-0.170	-0.140	0.090	0.050	0.010
	p	0.001	0.001	0.001	0.001	0.780
	n	3,549	3,549	3,549	3,549	3,545
Att9 life changes too fast	r	-0.040	-0.040	0.010	-0.010	-0.010
	p	0.010	0.020	0.500	0.480	0.550
	n	3,531	3,531	3,531	3,531	3,527
Knowledge scale K13	r	-0.440	-0.380	0.210	0.160	0.130
	p	0.001	0.001	0.001	0.001	0.001
	n	4,058	4,058	4,058	4,058	4,054
Intdis	r	-0.170	-0.180	0.000	0.060	0.090
	p	0.001	0.001	0.990	0.001	0.001
	n	4,058	4,058	4,058	4,058	4,054
Infodis	r	-0.190	-0.130	0.190	0.070	0.060
	p	0.001	0.001	0.001	0.001	0.001
	n	4,058	4,058	4,058	4,058	4,054
Sciact = scimus + zoo	r	-0.150	-0.210	-0.150	0.040	0.140
	p	0.001	0.001	0.001	0.010	0.001
	n	4,058	4,058	4,058	4,058	4,054

TABLE A.3.6: Mean values on indicators by Spanish regions, year and generational cohort

Variable	N.West	N.East	R. of Madrid	Centre	East	South	Canaries	Spain
Att1 more comfort, healthier	0.74	0.94	0.62	0.76	0.76	0.72	0.70	0.75
Att2 resources inexhaustible	-0.38	-0.30	-0.45	-0.32	-0.49	-0.24	-0.17	-0.36
Att3 not enough on faith (reversed)	-0.17	-0.36	-0.27	-0.42	-0.26	-0.45	-0.27	-0.32
Att4 no role to save environment (rev.)	0.27	0.53	0.39	0.12	0.37	0.30	0.26	0.33
Att5 allowed to do animal exp.	0.14	0.07	0.15	0.49	0.01	0.05	0.41	0.14
Att6 scientists are dangerous (reversed)	-0.12	-0.06	-0.13	-0.37	-0.35	-0.21	-0.34	-0.24
Att7 work more interesting	0.67	0.54	0.50	0.43	0.49	0.44	0.76	0.51
Att8 not important for daily life (rev.)	0.16	0.14	0.40	0.18	0.17	0.02	0.17	0.16
Att9 life changes too fast (reversed)	-0.76	-0.81	-0.79	-0.71	-0.83	-0.72	-0.69	-0.77
Att10 opportunities future generation	0.78	0.65	0.68	0.66	0.62	0.54	1.07	0.66
Knowledge scale K13	6.52	6.70	6.94	6.14	6.77	6.16	6.80	6.55
Drug experiment	0.67	0.57	0.63	0.58	0.58	0.50	0.56	0.58
Gene probability	0.61	0.56	0.68	0.45	0.62	0.63	0.56	0.60
Meth. = experi. + probab.	1.38	1.14	1.34	1.09	1.25	1.17	1.18	1.22
Intdis	0.25	0.29	0.39	0.25	0.26	0.22	0.38	0.27
Intmed	0.33	0.30	0.39	0.23	0.28	0.24	0.36	0.29
Intinven	0.24	0.25	0.36	0.26	0.25	0.21	0.34	0.26
Intsport	0.31	0.28	0.34	0.30	0.31	0.31	0.39	0.31
Intpolit	0.16	0.20	0.24	0.17	0.20	0.16	0.17	0.19
Infodis	0.14	0.14	0.18	0.15	0.17	0.14	0.21	0.16
Infomed	0.06	0.08	0.10	0.05	0.08	0.06	0.07	0.07
Infoven	0.05	0.07	0.09	0.05	0.08	0.06	0.09	0.07
Infospo	0.34	0.28	0.32	0.26	0.28	0.26	0.34	0.29
Infopol	0.18	0.18	0.20	0.13	0.16	0.14	0.14	0.16
Rival_dis	0.66	0.64	0.66	0.66	0.64	0.66	0.52	0.65
Rival_ind	0.63	0.65	0.62	0.65	0.60	0.60	0.50	0.61
Rival_biotech	0.58	0.61	0.56	0.57	0.56	0.59	0.46	0.57
Rival	1.87	1.90	1.85	1.88	1.81	1.85	1.49	1.84
Sciact = scimus + zoo	0.41	0.35	0.61	0.36	0.43	0.31	0.49	0.41
Scimus	0.15	0.11	0.25	0.15	0.17	0.12	0.24	0.16
Zoo	0.26	0.23	0.36	0.21	0.26	0.19	0.25	0.25
Nathist	0.14	0.16	0.27	0.15	0.17	0.13	0.27	0.17
Library	0.32	0.31	0.28	0.31	0.23	0.25	0.36	0.27
Art	0.22	0.24	0.35	0.25	0.19	0.18	0.26	0.23
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**	**4,058**

TABLE A.3.6 *(cont.):* Mean values in indicators by Spanish regions, year and generational cohort

Variable	1989	1992	2001	2005	New Order	Gen. X	Baby Boomer	Crisis &War	<1920s
Att1 more comfort, healthier	0.75	0.96	0.42	0.97	0.77	0.85	0.69	0.71	0.72
Att2 resources inexhaustible		-0.56	-0.32	0.06	-0.16	-0.51	-0.46	-0.37	-0.08
Att3 not enough on faith (reversed)	-0.55	-0.26	-0.16	-0.32	-0.00	-0.16	-0.24	-0.51	-0.60
Att4 no role to save environment (reversed)		0.56	0.26	0.00	0.20	0.51	0.29	0.26	0.20
Att5 allowed to do animal exp.		-0.25	0.27	0.64	0.32	0.08	0.15	0.16	0.03
Att6 scientists are dangerous (reversed)		-0.20	-0.26	-0.28	-0.27	-0.10	-0.28	-0.33	-0.28
Att7 work more interesting		0.51	0.41	0.69	0.58	0.58	0.54	0.45	0.35
Att8 not important for daily life (reversed)		0.49	-0.10	0.03	0.19	0.48	0.34	-0.10	-0.31
Att9 life changes too fast (reversed)	-0.82	-0.76	-0.68	-0.88	-0.69	-0.71	-0.80	-0.86	-0.76
Att10 opportunities for future generation		0.70	0.52	0.84	0.70	0.69	0.66	0.64	0.58
Knowledge scale K13	5.53	6.51	6.82	7.34	8.15	7.56	7.07	5.69	4.21
Drug experiment		0.59	0.57		0.64	0.67	0.60	0.52	0.41
Gene probability	0.49	0.63	0.67		0.74	0.74	0.65	0.52	0.35
Meth. = experi. + probab.		1.22	1.23		1.38	1.44	1.26	1.07	0.87
Intdis	0.19	0.37	0.29	0.25	0.38	0.34	0.31	0.20	0.15
Intmed	0.17	0.39		0.31	0.24	0.34	0.33	0.28	0.21
Intinven	0.18	0.33		0.27	0.36	0.36	0.29	0.20	0.12
Intsport	0.21	0.27	0.54	0.23	0.48	0.36	0.29	0.27	0.19
Intpolit	0.12	0.14	0.36	0.14	0.21	0.19	0.24	0.18	0.11
Infodis	0.05	0.06	0.44	0.08	0.32	0.19	0.16	0.11	0.06
Infomed	0.05	0.07		0.09	0.09	0.07	0.09	0.07	0.05
Infoven	0.06	0.07		0.09	0.14	0.09	0.07	0.05	0.03
Infospo	0.17	0.26	0.50	0.23	0.45	0.34	0.27	0.25	0.18
Infopol	0.09	0.11	0.31	0.13	0.16	0.16	0.21	0.16	0.10
Rival_dis	0.63	0.66		0.66	0.69	0.69	0.68	0.65	0.51
Rival_ind	0.61	0.60		0.64	0.70	0.63	0.63	0.63	0.52
Rival_biotech	0.57	0.55		0.59	0.63	0.60	0.59	0.58	0.48
Rival	1.81	1.81		1.88	2.02	1.91	1.90	1.86	1.50
Sciact = scimus + zoo	0.51	0.54	0.25	0.35	0.41	0.54	0.51	0.30	0.22
Scimus	0.18	0.20	0.12	0.16	0.21	0.22	0.19	0.12	0.08
Zoo	0.33	0.34	0.13	0.19	0.19	0.33	0.33	0.18	0.14
Nathist	0.18	0.16				0.23	0.22	0.12	0.10
Library		0.43	0.16	0.23	0.36	0.41	0.28	0.15	0.10
Art		0.34	0.15	0.20	0.20	0.30	0.29	0.18	0.11
Total	**1,001**	**1,021**	**1,000**	**1,036**	**441**	**1,155**	**841**	**1,010**	**611**

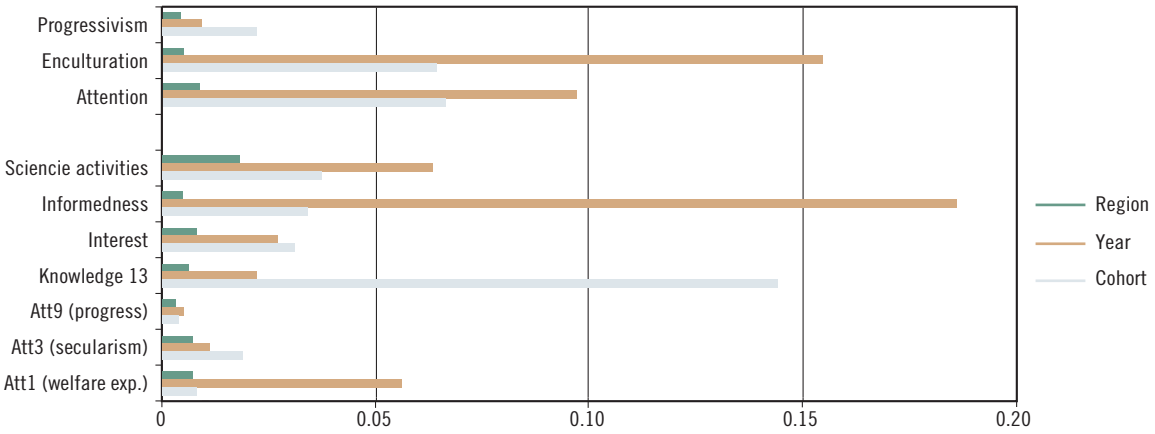

Figure A.3.4 Effect size (Eta2) for cohort, year and region on key indicators, controlling for level of education and sex

Appendix 4
Codebook Year by Year

TABLE A.4.1: Let us talk now about those issues in the news which interested you. For each issue I read out, please tell me if you are very interested, moderately interested or not at all interested in it (Spain)				
Spain news interest - sports				
	1989	1992	2001	2005
Very interested	21	27	54	23
Moderately interested	35	35		38
Not at all interested	44	38	45	39
DK/NA	0	1	1	0
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain news interest - politics				
	1989	1992	2001	2005
Very interested	12	14	36	14
Moderately interested	38	51		42
Not at all interested	50	34	63	44
DK/NA	1	2	1	1
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain news interest - new medical discoveries				
	1989	1992	2005	
Very interested	17	39	31	
Moderately interested	48	49	51	
Not at all interested	33	11	18	
DK/NA	2	1	1	
Total	**1,001**	**1,021**	**1,036**	
Spain news interest - new technologies				
	1989	1992	2005	
Very interested	18	33	27	
Moderately interested	42	47	49	
Not at all interested	37	18	24	
DK/NA	2	2	1	
Total	**1,001**	**1,021**	**1,036**	

TABLE A.4.1 *(cont.)*: Let us talk now about those issues in the news which interested you. For each issue I read out, please tell me if you are very interested, moderately interested or not at all interested in it (Spain)				
Spain news interest - scientific discoveries				
	1989	1992	2001	2005
Very interested	19	37	29	25
Moderately interested	43	43		51
Not at all interested	36	18	69	24
DK/NA	2	2	2	0
Total	**1,001**	**1,021**	**1,000**	**1,036**

TABLE A.4.2: Let us talk now about those issues in the news which interested you. For each issue I read out, please tell me if you are very interested, moderately interested or not at all interested in it (EU11)				
EU11 news interest - sports				
	1989	1992	2001	2005
Very interested	28	29	57	26
Moderately interested	36	38		41
Not at all interested	36	32	41	33
DK/NA	1	1	2	0
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 news interest - politics				
	1989	1992	2001	2005
Very interested	26	30	45	26
Moderately interest	49	51		49
Not at all interest	24	18	52	25
DK/NA	1	1	3	0
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 news interest - new medical discoveries				
	1989	1992	2005	
Very interested	39	44	36	
Moderately interested	44	44	48	
Not at all interested	16	11	15	
DK/NA	1	1	0	
Total	**10,677**	**12,003**	**11,418**	
EU11 news interest - new technologies				
	1989	1992	2005	
Very interested	31	34	32	
Moderately interested	44	46	47	
Not at all interested	23	19	20	
DK/NA	2	1	0	
Total	**10,677**	**12,003**	**11,418**	

France, Belgium, The Netherlands, W. and E. Germany, Italy, Luxembourg, Denmark, Republic of Ireland, Great Britain, Northern Ireland, Greece and Portugal.

TABLE A.4.2 *(cont.)*: Let us talk now about those issues in the news which interested you. For each issue I read out, please tell me if you are very interested, moderately interested or not at all interested in it (EU11)				
EU11 news interest - scientific discoveries				
	1989	1992	2001	2005
Very interested	32	36	34	32
Moderately interested	43	45		47
Not at all interested	22	18	62	20
DK/NA	2	1	5	1
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.3: I would like you to tell me for each of the following issues in the news if you are very well informed, moderately well informed or poorly informed about it (Spain)				
Spain news info level - sports				
	1989	1992	2001	2005
Very well	16	26	50	23
Moderately well	44	31		38
Poorly	38	39	50	38
DK/NA	1	3	0	1
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain news info level - politics				
	1989	1992	2001	2005
Very well	9	11	31	13
Moderately well	50	44		45
Poorly	39	42	68	41
DK/NA	1	3	1	1
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain news info level - medical discoveries				
	1989	1992	2005	
Very well	5	7	9	
Moderately well	47	48	47	
Poorly	47	42	43	
DK/NA	1	3	1	
Total	**1,001**	**1,021**	**1,036**	
Spain news info level - new technologies				
	1989	1992	2005	
Very well	6	7	9	
Moderately well	44	41	42	
Poorly	49	48	48	
DK/NA	2	4	1	
Total	**1,001**	**1,021**	**1,036**	

TABLE A.4.3 *(cont.)*: I would like you to tell me for each of the following issues in the news if you are very well informed, moderately well informed or poorly informed about it (Spain)

Spain news info level - scientific discoveries				
	1989	1992	2001	2005
Very well	5	6	44	8
Moderately well	43	39		41
Poorly	50	51	55	51
DK/NA	2	4	1	1
Total	**1,001**	**1,021**	**1,000**	**1,036**

TABLE A.4.4: I would like you to tell me for each of the following issues in the news if you are very well informed, moderately well informed or poorly informed about it (EU11)

EU11 news info level - sports				
	1989	1992	2001	2005
Very well	23	26	57	27
Moderately well	39	41		42
Poorly	36	32	42	30
DK/NA	2	1	1	1
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 news info level - politics				
	1989	1992	2001	2005
Very well	20	22	44	23
Moderately well	56	60		57
Poorly	22	17	54	20
DK/NA	2	1	2	1
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 news info level - medical discoveries				
	1989	1992	2001	
Very well	13	12	13	
Moderately well	56	59	60	
Poorly	29	28	26	
DK/NA	2	2	1	
Total	**10,677**	**12,003**	**11,418**	
EU11 news info level - new technologies				
	1989	1992	2001	
Very well	11	10	11	
Moderately well	51	52	55	
Poorly	35	37	33	
DK/NA	3	2	1	
Total	**10,677**	**12,003**	**11,418**	

TABLE A.4.4 *(cont.):* I would like you to tell me for each of the following issues in the news if you are very well informed, moderately well informed or poorly informed about it (EU11)				
EU11 news info level - scientific discoveries				
	1989	1992	2001	2005
Very well	11	9	46	10
Moderately well	50	51		54
Poorly	36	38	52	35
DK/NA	3	2	3	1
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.5: Now, let me ask you about your use of museums, zoos and similar institutions. Can you tell me how many times in the last twelve months you have visited each type of place that I am going to read out? If you have never been there, say "NONE" (Spain)				
Spain cultural institutions visit - science tech. museum				
	1989	1992	2001	2005
Visited	18	20	12	16
Never visited	81	79	88	84
DK/NA	1	2		
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain cultural institutions visit - zoo aquarium				
	1989	1992	2001	2005
Visited	33	34	13	19
Never visited	66	64	87	81
DK/NA	1	2		
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain cultural institutions visit - natural history museum				
	1989	1992		
Visited	18	16		
Never visited	81	82		
DK/NA	1	2		
Total	**1,001**	**1,021**		
Spain cultural institutions visit - public library				
	1992	2001	2005	
Visited	43	16	23	
Never visited	56	84	77	
DK/NA	2			
Total	**1,021**	**1,000**	**1,036**	
Spain cultural institutions visit - art museum				
	1992	2001	2005	
Visited	34	15	20	
Never visited	65	86	80	
DK/NA	1			
Total	**1,021**	**1,000**	**1,036**	

TABLE A.4.6: Now, let me ask you about your use of museums, zoos and similar institutions. Can you tell me how many times in the last twelve months you have visited each type of place that I am going to read out? If you have never been there, say "NONE" (EU11)

EU11 cultural institutions visit - science tech. museum				
	1989	1992	2001	2005
Visited	17	17	11	15
Never visited	82	83	90	85
DK/NA	2	1		
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 cultural institutions visit - zoo aquarium				
	1989	1992	2001	2005
Visited	34	37	27	29
Never visited	63	62	73	71
DK/NA	3	1		
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 cultural institutions visit - natural history museum				
	1989	1992		
Visited	20	20		
Never visited	78	79		
DK/NA	2	1		
Total	**10,677**	**12,003**		
EU11 cultural institutions visit - public library				
	1992	2001	2005	
Visited	43	32	36	
Never visited	56	68	64	
DK/NA	1			
Total	**12,003**	**12,089**	**11,418**	
EU11 cultural institutions visit - art museum				
	1992	2001	2005	
Visited	27	21	25	
Never visited	73	79	75	
DK/NA	1			
Total	**12,003**	**12,089**	**11,418**	

TABLE A.4.7: Here is a quick quiz. For each thing I say, please tell me if it is true or false. If you don´t know, say so, and we will skip to the next (Spain)				
Spain knowledge - centre of earth				
	1989	1992	2001	2005
True	71	82	88	81
False	7	4	3	11
DK/NA	23	14	10	9
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain knowledge - oxygen				
	1989	1992	2001	2005
True	70	72	77	73
False	17	18	15	21
DK/NA	13	11	9	6
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain knowledge - radioactive milk				
	1989	1992	2001	2005
True	29	11	20	15
False	41	64	37	65
DK/NA	30	25	43	20
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain knowledge - electrons				
	1989	1992	2001	2005
True	34	42	44	46
False	15	14	15	25
DK/NA	50	44	41	30
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain knowledge - continents moving				
	1989	1992	2001	2005
True	58	74	79	79
False	11	5	8	9
DK/NA	32	22	14	12
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain knowledge - gene deciding sex				
	1989	1992	2001	2005
True	40	38	39	51
False	32	26	35	27
DK/NA	28	36	26	22
Total	**1,001**	**1,021**	**1,000**	**1,036**

TABLE A.4.8: Here is a quick quiz. For each thing I say, please tell me if it is true or false. If you don´t know, say so, and we will skip to the next (EU11)				
EU11 knowledge - centre of earth				
	1989	1992	2001	2005
True	84	85	87	86
False	4	4	4	6
DK/NA	12	11	9	7
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 knowledge - oxygen				
	1989	1992	2001	2005
True	78	81	80	81
False	13	12	13	15
DK/NA	9	7	7	4
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 knowledge - radioactive milk				
	1989	1992	2001	2005
True	13	12	12	9
False	63	63	65	74
DK/NA	24	25	23	17
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 knowledge - electrons				
	1989	1992	2001	2005
True	40	40	40	42
False	21	23	23	30
DK/NA	39	37	37	27
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 knowledge - continents moving				
	1989	1992	2001	2005
True	65	79	81	87
False	13	5	5	5
DK/NA	22	16	14	8
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 knowledge - gene deciding sex				
	1989	1992	2001	2005
True	48	48	50	67
False	27	28	29	18
DK/NA	25	23	21	15
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.9: Here is a quick quiz. For each thing I say, please tell me if it is true or false. If you don´t know, say so, and we will skip to the next (Spain)				
Spain knowledge - earliest humans				
	1989	1992	2001	2005
True	31	26	26	29
False	34	41	51	55
DK/NA	35	33	23	15
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain knowledge - antibiotics				
	1989	1992	2001	2005
True	44	41	45	46
False	21	25	28	35
DK/NA	35	33	27	19
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain knowledge - lasers				
	1989	1992	2001	2005
True	17	16	26	32
False	23	31	26	34
DK/NA	59	53	48	33
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain knowledge - radioactivity				
	1989	1992	2001	2005
True	28	29	26	34
False	41	40	48	47
DK/NA	31	31	27	18
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain knowledge - human beings				
	1989	1992	2001	2005
True	59	71	75	73
False	22	11	12	16
DK/NA	19	18	13	11
Total	**1,001**	**1,021**	**1,000**	**1,036**

TABLE A.4.10: Here is a quick quiz. For each thing I say, please tell me if it is true or false. If you don´t know, say so, and we will skip to the next (EU11)				
EU11 knowledge - earliest humans				
	1989	1992	2001	2005
True	28	27	22	22
False	44	48	57	65
DK/NA	28	25	21	13
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 knowledge - antibiotics				
	1989	1992	2001	2005
True	59	56	44	38
False	24	27	39	51
DK/NA	18	17	17	11
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.10 *(cont.)*: Here is a quick quiz. For each thing I say, please tell me if it is true or false. If you don´t know, say so, and we will skip to the next (EU11)				
EU11 knowledge - lasers				
	1989	1992	2001	2005
True	25	27	27	26
False	34	35	34	45
DK/NA	41	38	39	30
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 knowledge - radioactivity				
	1989	1992	2001	2005
True	23	26	30	28
False	54	53	50	59
DK/NA	23	21	21	14
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 knowledge - human beings				
	1989	1992	2001	2005
True	58	64	67	70
False	25	18	19	20
DK/NA	17	18	15	10
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.11: Does the sun go around the earth? (Spain)				
Spain knowledge earth movement - sun				
	1989	1992	2001	2005
Sun orbits earth	8	6	25	34
Earth orbits sun	80	86	66	60
DK/NA	13	8	9	6
Total	**1,001**	**1,021**	**1,000**	**1,036**

TABLE A.4.12: How long does it take for the earth to go around the sun? (Spain)				
Spain knowledge earth movement - time				
	1989	1992	2001	2005
Year	54	65	67	61
Month	12	14	14	23
DK/NA	14	8	19	16
Inap.	20	14		
Total	**1,001**	**1,021**	**1,000**	**1,036**

TABLE A.4.13: Does the sun go around the earth? (EU11)

EU11 knowledge earth movement - sun				
	1989	1992	2001	2005
Sun orbits earth	12	13	30	33
Earth orbits sun	80	80	63	64
DK/NA	8	7	7	4
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.14: How long does it take for the earth to go around the sun? (EU11)

EU11 knowledge earth movement - time				
	1989	1992	2001	2005
Year	50	50	55	64
Month	19	20	24	18
DK/NA	12	10	22	18
Inap.	20	20		
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.15: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is (Spain)

Spain science opinion economics(a)			
	1992	2001	2005
Scientific	42	28	55
Not scientific	47	62	34
DK/NA	11	11	11
Total	**1,021**	**1,000**	**1,036**
Spain science opinion medicine(a)			
	1992	2001	2005
Scientific	88	88	91
Not scientific	5	7	3
DK/NA	7	5	6
Total	**1,021**	**1,000**	**1,036**
Spain science opinion psychology(a)			
	1992	2001	2005
Scientific	64	47	71
Not scientific	24	41	18
DK/NA	12	11	11
Total	**1,021**	**1,000**	**1,036**

TABLE A.4.15 *(cont.)*: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is (Spain)			
Spain science opinion biology(b)			
	1992	2001	2005
Scientific	80	83	83
Not scientific	7	6	6
DK/NA	13	11	11
Total	**1,021**	**1,000**	**1,036**
Spain science opinion astronomy(b)			
	1992	2001	2005
Scientific	79	75	77
Not scientific	9	13	12
DK/NA	13	13	10
Total	**1,021**	**1,000**	**1,036**
Spain science opinion history(b)			
	1992	2001	2005
Scientific	43	20	50
Not scientific	47	70	39
DK/NA	11	10	11
Total	**1,021**	**1,000**	**1,036**

TABLE A.4.16: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is (EU11)			
EU11 science opinion economics(a)			
	1992	2001	2005
Scientific	56	47	67
Not scientific	38	44	29
DK/NA	7	9	4
Total	**12,003**	**12,089**	**11,418**
EU11 science opinion medicine(a)			
	1992	2001	2005
Scientific	93	93	95
Not scientific	4	4	3
DK/NA	3	3	2
Total	**12,003**	**12,089**	**11,418**
EU11 science opinion psychology(a)			
	1992	2001	2005
Scientific	73	69	79
Not scientific	19	23	17
DK/NA	8	8	4
Total	**12,003**	**12,089**	**11,418**

TABLE A.4.16 *(cont.)*: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is (EU11)			
EU11 science opinion biology(b)			
	1992	2001	2005
Scientific	86	89	89
Not scientific	7	6	7
DK/NA	7	6	4
Total	**12,003**	**12,089**	**11,418**
EU11 science opinion astronomy(b)			
	1992	2001	2005
Scientific	83	78	82
Not scientific	10	14	13
DK/NA	8	8	5
Total	**12,003**	**12,089**	**11,418**
EU11 science opinion history(b)			
	1992	2001	2005
Scientific	54	40	59
Not scientific	41	54	37
DK/NA	5	7	4
Total	**12,003**	**12,089**	**11,418**

TABLE A.4.17: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is (Spain)			
Spain science opinion physics(b)			
	1992	2001	2005
Scientific	86	87	85
Not scientific	4	6	5
DK/NA	10	7	10
Total	**1,021**	**1,000**	**1,036**
Spain science opinion astrology(b)			
	1992	2001	2005
Scientific	59	61	44
Not scientific	28	26	45
DK/NA	13	13	11
Total	**1,021**	**1,000**	**1,036**
Spain science opinion mathematics			
	2001	2005	
Scientific	64	82	
Not scientific	26	9	
DK/NA	10	9	
Total	**1,000**	**1,036**	

TABLE A.4.17 *(cont.)*: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is (Spain)

Spain science opinion homeopathy	
	2005
Scientific	57
Not scientific	19
DK/NA	24
Total	**1,036**

TABLE A.4.18: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is (EU11)

EU11 science opinion physics(b)			
	1992	2001	2005
Scientific	89	89	91
Not scientific	4	6	5
DK/NA	7	5	4
Total	**12,003**	**12,089**	**11,418**
EU11 science opinion astrology(b)			
	1992	2001	2005
Scientific	57	53	40
Not scientific	35	38	55
DK/NA	8	9	5
Total	**12,003**	**12,089**	**11,418**
EU11 science opinion mathematics			
	2001	2005	
Scientific	73	85	
Not scientific	21	11	
DK/NA	6	4	
Total	**12,089**	**11,418**	
EU11 science opinion homeopathy			
	2005		
Scientific	59		
Not scientific	31		
DK/NA	11		
Total	**11,418**		

TABLE A.4.19: Let us imagine that two scientists want to know if a certain drug is effective against a disease. In your opinion, which is the better way to test this drug? (Spain)

Spain scientific drug test evaluation		
	1992	2001
1st scientist	19	21
2nd scientist	58	29
3rd scientist		28
DK/NA	22	23
Total	**1,021**	**1,000**

TABLE A.4.20: Suppose doctors tell a couple that their genetic make-up means that they've got a one in four chance of having a child with an inherited illness. Does this mean that? (Spain)

Spain knowledge hereditary disease risk			
	1989	1992	2001
3 children o.k.	5	4	2
1st child sick	6	5	5
Same risk each	49	63	67
4th child sick	7	6	7
DK/NA	34	22	19
Total	**1,001**	**1,021**	**1,000**

TABLE A.4.21: Let us imagine that two scientists want to know if a certain drug is effective against a disease. In your opinion, which is the better way to test this drug? (EU11)

EU11 scientific drug test evaluation		
	1992	2001
1st scientist	20	15
2nd scientist	67	26
3rd scientist		39
DK/NA	13	20
Total	**12,003**	**12,089**

TABLE A.4.22: Suppose doctors tell a couple that their genetic make-up means that they've got a one in four chance of having a child with an inherited illness. Does this mean that? (EU11)

EU11 knowledge hereditary disease risk			
	1989	1992	2001
3 children o.k.	4	3	3
1st child sick	7	6	6
Same risk each	63	70	69
4th child sick	6	5	6
DK/NA	20	16	16
Total	**10,677**	**12,003**	**12,089**

I would like to read you now some statements that people have made about science, technology or the environment. For each statement, please, tell me how much you agree or disagree.

TABLE A.4.23: "Science and technology are making our lives healthier, easier and more comfortable" (Spain)

Spain science & technology life comfort(a)				
	1989	1992	2001	2005
Strongly agree	25	33		29
Agree some extent	39	44	67	44
Neither nor	16	5		18
Disagree some extent	6	9	25	4
Strongly disagree	4	3		1
DK/NA	11	6	8	4
Total	**1,001**	**1,021**	**1,000**	**527**

TABLE A.4.24: "Thanks to scientific and technological advances, the earth's natural resources will be inexhaustible" (Spain)

Spain science & technology resources(a)			
	1992	2001	2005
Strongly agree	7		10
Agree some extent	19	25	22
Neither nor	6		27
Disagree some extent	23	57	20
Strongly disagree	32		14
DK/NA	13	18	8
Total	**1,021**	**1,000**	**527**

TABLE A.4.25: "We depend too much on science and not enough on faith" (Spain)

Spain science & technology faith(a)				
	1989	1992	2001	2005
Strongly agree	21	23		14
Agree some extent	35	26	48	31
Neither nor	15	9		29
Disagree some extent	8	15	33	13
Strongly disagree	7	16		7
DK/NA	15	12	19	5
Total	**1,001**	**1,021**	**1,000**	**527**

TABLE A.4.26: "Scientific and technological research cannot play an important role in protecting the environment and repairing it" (Spain)

Spain science & technology environment(a)			
	1992	2001	2005
Strongly agree	9		9
Agree some extent	16	29	25
Neither nor	6		26
Disagree some extent	22	55	22
Strongly disagree	34		10
DK/NA	13	16	7
Total	**1,021**	**1,000**	**527**

I would like to read you now some statements that people have made about science, technology or the environment. For each statement, please, tell me how much you agree or disagree.

TABLE A.4.27: "Science and technology are making our lives healthier, easier and more comfortable" (EU11)

EU11 science & technology life comfort(a)				
	1989	1992	2001	2005
Strongly agree	25	27		32
Agree some extent	47	51	71	44
Neither nor	13	6		14
Disagree some extent	7	8	19	6
Strongly disagree	2	3		2
DK/NA	5	5	10	2
Total	**10,677**	**12,003**	**12,089**	**5,700**

TABLE A.4.28: "Thanks to scientific and technological advances, the earth's natural resources will be inexhaustible" (EU11)

EU11 science & technology resources(a)			
	1992	2001	2005
Strongly agree	6		6
Agree some extent	18	23	16
Neither nor	8		16
Disagree some extent	26	59	28
Strongly disagree	32		28
DK/NA	11	18	7
Total	**12,003**	**12,089**	**5,700**

TABLE A.4.29: "We depend too much on science and not enough on faith" (EU11)

EU11 science & technology faith(a)				
	1989	1992	2001	2005
Strongly agree	17	16		12
Agree some extent	27	28	45	26
Neither nor	20	10		25
Disagree some extent	15	20	37	19
Strongly disagree	11	18		14
DK/NA	10	8	17	4
Total	**10,677**	**12,003**	**12,089**	**5,700**

TABLE A.4.30: "Scientific and technological research cannot play an important role in protecting the environment and repairing it" (EU11)

EU11 science & technology environment(a)			
	1992	2001	2005
Strongly agree	7		7
Agree some extent	17	28	19
Neither nor	6		15
Disagree some extent	26	59	32
Strongly disagree	35		22
DK/NA	9	13	4
Total	**12,003**	**12,089**	**5,700**

TABLE A.4.31: "Scientists should be allowed to undertake research that causes pain and injury to animals like dogs and chimpanzees if it can produce information about human health problems" (Spain)

Spain science & technology animals(a)			
	1992	2001	2005
Strongly agree	17		25
Agree some extent	21	56	33
Neither nor	6		23
Disagree some extent	17	29	8
Strongly disagree	31		6
DK/NA	8	15	5
Total	**1,021**	**1,000**	**527**

TABLE A.4.32: "Because of their knowledge, scientific researchers have a power that makes them dangerous" (Spain)

Spain science & technology researchers(a)			
	1992	2001	2005
Strongly agree	19		14
Agree some extent	29	56	35
Neither nor	6		21
Disagree some extent	17	30	12
Strongly disagree	15		11
DK/NA	14	14	7
Total	**1,021**	**1,000**	**509**

TABLE A.4.33: "The application of science and new technology will make work more interesting" (Spain)

Spain science & technology work(a)			
	1992	2001	2005
Strongly agree	23		20
Agree some extent	34	61	42
Neither nor	9		22
Disagree some extent	12	20	7
Strongly disagree	8		3
DK/NA	15	19	6
Total	**1,021**	**1,000**	**509**

TABLE A.4.34: "For me, in my daily life, it is not important to know about science" (Spain)

Spain science & technology daily life(a)			
	1992	2001	2005
Strongly agree	13		14
Agree some extent	15	51	25
Neither nor	7		18
Disagree some extent	26	41	21
Strongly disagree	32		18
DK/NA	7	8	4
Total	**1,021**	**1,000**	**509**

TABLE A.4.35: "Scientists should be allowed to undertake research that causes pain and injury to animals like dogs and chimpanzees if it can produce information about human health problems" (EU11)

EU11 science & technology animals(a)			
	1992	2001	2005
Strongly agree	11		16
Agree some extent	25	49	28
Neither nor	7		18
Disagree some extent	18	38	15
Strongly disagree	34		20
DK/NA	6	13	4
Total	**12,003**	**12,089**	**5,700**

TABLE A.4.36: "Because of their knowledge, scientific researchers have a power that makes them dangerous" (EU11)

EU11 science & technology researchers(a)			
	1992	2001	2005
Strongly agree	27		21
Agree some extent	36	63	37
Neither nor	7		17
Disagree some extent	13	24	14
Strongly disagree	8		8
DK/NA	8	13	3
Total	**12,003**	**12,089**	**5,718**

TABLE A.4.37: "The application of science and new technology will make work more interesting" (EU11)

EU11 science & technology work(a)			
	1992	2001	2005
Strongly agree	19		25
Agree some extent	41	64	44
Neither nor	9		18
Disagree some extent	14	19	8
Strongly disagree	7		3
DK/NA	10	18	4
Total	**12,003**	**12,089**	**5,718**

TABLE A.4.38: "For me, in my daily life, it is not important to know about science" (EU11)

EU11 science & technology daily life(a)			
	1992	2001	2005
Strongly agree	14		16
Agree some extent	23	43	23
Neither nor	7		15
Disagree some extent	27	49	26
Strongly disagree	24		20
DK/NA	5	8	1
Total	**12,003**	**12,089**	**5,718**

TABLE A.4.39: "Science makes our way of life change too fast" (Spain)

Spain science & technology way of life(a)				
	1989	1992	2001	2005
Strongly agree	27	32		28
Agree some extent	41	34	80	42
Neither nor	10	7		18
Disagree some extent	7	12	11	6
Strongly disagree	3	5		2
DK/NA	12	9	9	4
Total	**1,001**	**1,021**	**1,000**	**509**

TABLE A.4.40: "Thanks to science and technology, there will be more opportunities for the future generation" (Spain)

Spain science & technology future(a)			
	1992	2001	2005
Strongly agree	33		30
Agree some extent	29	67	36
Neither nor	7		17
Disagree some extent	10	16	8
Strongly disagree	7		2
DK/NA	14	17	7
Total	**1,021**	**1,000**	**509**

TABLE A.4.41: "Science makes our way of life change too fast" (EU11)

EU11 science & technology way of life(a)				
	1989	1992	2001	2005
Strongly agree	25	23		21
Agree some extent	33	35	60	35
Neither nor	15	9		17
Disagree some extent	14	18	28	17
Strongly disagree	6	8		7
DK/NA	6	7	12	2
Total	**10,677**	**12,003**	**12,089**	**5,718**

TABLE A.4.42: "Thanks to science and technology, there will be more opportunities for the future generation" (EU11)

EU11 science & technology future(a)			
	1992	2001	2005
Strongly agree	27		35
Agree some extent	40	74	41
Neither nor	8		12
Disagree some extent	11	12	6
Strongly disagree	5		2
DK/NA	9	14	3
Total	**12,003**	**12,089**	**5,718**

TABLE A.4.43: In which of the following areas is the European Community itself active? (Spain)			
Spain EC activities in agriculture			
	1989	1992	2001
Active	32	60	56
Non active	68	40	44
Total	**1,001**	**1,021**	**1,000**
Spain EC activities in energy			
	1989	1992	2001
Active	12	33	27
Non active	88	67	73
Total	**1,001**	**1,021**	**1,000**
Spain EC activities in science&technology			
	1989	1992	2001
Active	13	38	37
Non active	87	62	63
Total	**1,001**	**1,021**	**1,000**
Spain EC activities in environment			
	1989	1992	2001
Active	15	43	43
Non active	85	57	58
Total	**1,001**	**1,021**	**1,000**
Spain EC activities in defence			
	1989	1992	2001
Active	16	36	41
Non active	84	64	59
Total	**1,001**	**1,021**	**1,000**

TABLE A.4.44: In which of the following areas is the European Community itself active? (EU11)			
EU11 EC activities in agriculture			
	1989	1992	2001
Active	49	63	62
Non active	51	37	38
DK/NA		0	
Total	**10,677**	**12,003**	**12,089**
EU11 EC activities in energy			
	1989	1992	2001
Active	20	31	36
Non active	80	69	65
DK/NA		0	
Total	**10,677**	**12,003**	**12,089**

TABLE A.4.44 *(cont.):* In which of the following areas is the European Community itself active? (EU11)			
EU11 EC activities in science&technology			
	1989	1992	2001
Active	20	35	40
Non active	80	65	60
DK/NA		0	
Total	**10,677**	**12,003**	**12,089**
EU11 EC activities in environment			
	1989	1992	2001
Active	30	47	54
Non active	70	53	46
DK/NA		0	
Total	**10,677**	**12,003**	**12,089**
EU11 EC activities in defence			
	1989	1992	2001
Active	16	33	42
Non active	84	68	58
DK/NA		0	
Total	**10,677**	**12,003**	**12,089**

TABLE A.4.45: For each of the following fields, could you tell me whether you think Europe is ahead of, behind, or at the same level as the United States? (Spain)			
Spain research EUR-USA scientific discoveries			
	1989	1992	2005
Ahead	7	8	6
Behind	63	66	66
Same level	11	14	16
DK/NA	19	12	12
Total	**1,001**	**1,021**	**1,036**
Spain research EUR-USA industry technology			
	1989	1992	2005
Ahead	5	9	8
Behind	61	60	64
Same level	13	15	15
DK/NA	22	16	13
Total	**1,001**	**1,021**	**1,036**
Spain research EUR-USA life technology			
	1989	1992	2005
Ahead	7	10	8
Behind	57	55	59
Same level	13	18	20
DK/NA	23	16	13
Total	**1,001**	**1,021**	**1,036**

TABLE A.4.46: For each of the following fields, could you tell me whether you think Europe is ahead of, behind, or at the same level as the United States? (EU11)			
EU11 research EUR-USA scientific discoveries			
	1989	1992	2005
Ahead	13	16	12
Behind	46	46	50
Same level	27	26	28
DK/NA	14	12	10
Total	**10,677**	**12,003**	**11,418**
EU11 research EUR-USA industry technology			
	1989	1992	2005
Ahead	14	18	14
Behind	43	41	47
Same level	27	27	28
DK/NA	16	14	12
Total	**10,677**	**12,003**	**11,418**
EU11 research EUR-USA life technology			
	1989	1992	2001
Ahead	12	17	14
Behind	47	42	44
Same level	25	27	31
DK/NA	16	15	11
Total	**10,677**	**12,003**	**11,418**

TABLE A.4.47: Demographic indicators (Spain)				
Spain marital status				
	1989	1992	2001	2005
Single	31	33	31	23
Married/living as married	59	57	54	62
Divorced/separated/widowed	9	10	13	15
DK/NA			1	0
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain sex				
	1989	1992	2001	2005
Male	49	49	49	44
Female	51	51	52	56
Total	**1,001**	**1,021**	**1,000**	**1,036**

TABLE A.4.48: How old were you when you finished your full-time education? (Spain)				
Spain age education				
	1989	1992	2001	2005
14 years or younger	50	42	34	39
15 years	5	5	5	4
16 years	7	9	11	7
17 years	5	5	5	4
18 years	4	8	11	8
19 years	3	3	3	3
20 years	3	3	3	4
21 years	2	2	3	3
22 years or older	8	9	12	14
Still studying	14	14	15	10
Never studied				1
DK/NA				2
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain age education recoded				
	1989	1992	2001	2005
Up to 15 years	55	46	39	43
16-19 years	19	25	29	22
20+ years	12	15	18	21
Still studying	14	14	15	10
Never studied/NA				3
Total	**1,001**	**1,021**	**1,000**	**1,036**

TABLE A.4.49: Demographic indicators (EU11)				
EU11 marital status				
	1989	1992	2001	2005
Single	26	25	24	19
Married/living as married	62	62	59	63
Divorced/separated/widowed	12	13	16	17
DK/NA	0		2	1
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 sex				
	1989	1992	2001	2005
Male	49	49	48	46
Female	51	51	52	54
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.50: How old were you when you finished your full-time education? (EU11)				
EU11 age education				
	1989	1992	2001	2005
14 years or younger	28	23	20	18
15 years	9	8	8	7
16 years	11	12	12	10
17 years	8	8	8	7
18 years	11	12	13	12
19 years	5	5	6	6
20 years	4	5	5	6
21 years	4	3	4	5
22 years or older	10	13	15	19
Still studying	11	11	10	8
Never studied				0
DK/NA		0	0	2
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 age education recoded				
	1989	1992	2001	2005
Up to 15 years	37	31	27	25
16-19 years	34	37	39	36
20+years	18	21	24	29
Still studying	11	11	10	8
Never studied/NA		0	0	2
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.51: How old are you? (Exact years of age) (Spain)					
Spain age exact					
	No.	Minimum	Maximum	Mean	Std. deviation
1989	**1,001**	15	93	42	19
1992	**1,021**	15	92	42	19
2001	**1,000**	15	93	43	19
2005	**1,036**	15	93	46	20
Spain age recoded - 4 groups					
	1989	1992	2001	2005	
15-24	22	21	21	15	
25-39	30	29	29	28	
40-54	18	21	20	23	
55 and more	30	29	30	34	
Total	**1,001**	**1,021**	**1,000**	**1,036**	

TABLE A.4.52: How old are you? (Exact years of age) (EU11)					
	EU11 age exact				
	No.	Minimum	Maximum	Mean	Std. deviation
1989	**10,660**	15	97	42	18
1992	**12,003**	15	94	43	18
2001	**12,089**	15	99	45	18
2005	**11,418**	15	96	47	18
EU11 age recoded - 4 groups					
	1989	1992	2001	2005	
15-24	19	18	16	12	
25-39	30	29	28	26	
40-54	24	23	25	27	
55 and more	27	29	32	35	
Total	**10,660**	**12,003**	**12,089**	**11,418**	

TABLE A.4.53: What is your current occupation? (respondent Spain)				
	Spain occupation of respondent			
	1989	1992	2001	2005
Farmer	2	1	1	1
Professional	1	1	1	2
Owners of shops-business proprietors	7			
Owners of shops-self-employed		7	6	2
Business proprietors		2	3	3
Employed professional	2	2	1	3
General management	0		0	0
Middle management	3	4	4	2
Employed at desk		5	8	7
Other office employed	5			
Non-office employed	4			
Employed but travelling		2	3	4
Employed but in service		5	4	4
Skilled manual worker	8	6	12	13
Supervisors	0	1	1	1
Other manual worker	6	6	5	4
Housewife not employed	27	21	15	24
Student	12	14	15	10
Military service	0			
Retired	16	17	16	18
Unemployed	7	6	6	4
DK/NA	0			
Total	**1,001**	**1,021**	**1,000**	**1,036**

TABLE A.4.54: What is your current occupation? (respondent EU11)

EU11 occupation of respondent				
	1989	1992	2001	2005
Farmer	4	2	1	1
Fisherman	0	0	0	0
Professional	2	1	1	2
Owners of shops-business proprietors	5			
Owners of shops-self-employed		5	4	4
Business proprietors		2	1	2
Employed professional	2	1	1	2
General management	2	1	1	2
Middle management	6	7	6	8
Employed at desk		7	8	9
Other office employed	7			
Non-office employed	6			
Employed but travelling		2	3	3
Employed but in service		6	7	7
Skilled manual worker	9	9	10	8
Supervisors	1	1	1	1
Other manual worker	6	4	5	4
Housewife not employed	19	15	12	12
Student	10	10	10	8
Military service	0			
Retired	16	19	22	24
Unemployed	5	7	6	5
DK/NA	1	0		
Total	**10,677**	**12,003**	**12,089**	**11,418**

TABLE A.4.55: What is your current occupation? (respondent last job Spain)

Spain occupation of respondent - last job				
	1989	1992	2001	2005
Farmer	2	2	1	4
Professional	0	0		1
Owners of shops-business proprietors	2			
Owners of shops-self-employed		1	1	1
Business proprietors		0	1	1
Employed professional	1	0	0	1
General management	0	0		
Middle management	0	1	1	2
Employed at desk		2	2	6
Other office employed	2			
Non-office employed	4			

TABLE A.4.55 *(cont.)*: What is your current occupation? (respondent last job Spain)				
Spain occupation of respondent - last job				
	1989	1992	2001	2005
Employed but travelling		1	1	3
Employed but in service		2	2	4
Skilled manual worker	8	6	9	21
Supervisors	0	1	0	2
Other manual worker	11	6	6	17
Never any paid work	30	34	27	37
Inap.-Not 13-17 V490	39	43	48	
Total	**1,001**	**1,021**	**1,000**	**578**
Spain type of community				
	1989	1992	2001	2005
Rural/village	39	39	39	35
Small/middle town	34	39	37	35
Large town	26	21	24	30
DK/NA		0	0	
Total	**1,001**	**1,021**	**1,000**	**1,036**
Spain religion - denomination				
	1989	1992	2005	
Roman catholic	86	80	73	
Protestant/other christians	2		2	
Orthodox			0	
Jewish			0	
Muslim	0	0	0	
Buddhist			0	
Hindu		0		
Other	1	2	2	
None/DK/NA	11	19	23	
Total	**1,001**	**1,021**	**1,036**	

TABLE A.4.56: What is your current occupation? (respondent last job EU11)				
EU11 occupation of respondent - last job				
	1989	1992	2001	2005
Farmer	2	2	1	3
FIsherman	0	0	0	0
Professional	0	0	0	1
Owners of shops-business proprietors	2			
Owners of shops-self-employed		2	1	4
Business proprietors		0	0	1
Employed professional	1	1	0	2
General management	1	1	1	3
Middle management	3	4	3	9
Employed at desk		5	5	11
Other office employed	5			
Non-office employed	5			

TABLE A.4.56 *(cont.):* What is your current occupation? (respondent last job EU11)				
EU11 occupation of respondent - last job				
	1989	1992	2001	2005
Employed but travelling		1	2	3
Employed but in service		4	4	10
Skilled manual worker	4	6	7	14
Supervisors	1	1	1	2
Other manual worker	7	7	8	14
Never any paid work	19	19	17	24
DK/NA	1			
Inap.-Not 13-17 V490	50	49	50	
Total	**10,677**	**12,003**	**12,089**	**5,597**
EU11 type of community				
	1989	1992	2001	2005
Rural/village	37	36	32	34
Small/middle town	35	34	36	38
Large town	28	29	30	28
DK/NA	0	1	1	0
Total	**10,677**	**12,003**	**12,089**	**11,418**
EU11 religion - denomination				
	1989	1992	2005	
Roman catholic	50	45	46	
Protestant/other christians	22	20	21	
Orthodox	9	8	9	
Jewish	0	0	0	
Muslim	0	0	1	
Buddhist	0	0	0	
Hindu	0	0	0	
Other	1	2	2	
None/DK/NA	18	24	20	
Total	**10,677**	**12,003**	**11,418**	

Appendix 5
Codebook by Spanish Regions

TABLE A.5.1: Distribution of regions in percentages

	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Galicia	60.5						
Principality of Asturias	25.9						
Cantabria	13.7						
Basque Country		49.4					
Navarre		12.0					
La Rioja		6.5					
Aragon		32.1					
Autonomous Region of Madrid			100.0				
Castile and Leon				49.1			
Castile-La Mancha				30.9			
Extremadura				20.1			
Catalonia					56.1		
Valencian Community					37.0		
Balearic Islands					7.0		
Andalusia						86.3	
Murcia						13.7	
Canary Islands							100.0
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.2: Let us talk now about those issues in the news which interested you. For each issue I read out, please tell me if you are very interested, moderately interested or not at all interested in it

News interest - sports	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Very interested	31.0	27.8	33.7	29.7	30.7	30.7	38.5
Moderately interested	29.9	31.8	26.4	24.6	27.0	23.9	34.8
Not at all interested	38.5	39.6	38.7	45.5	42.2	44.3	26.7
DK/NA	0.6	0.7	1.1	0.2	0.2	1.1	
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.2 *(cont.):* Let us talk now about those issues in the news which interested you. For each issue I read out, please tell me if you are very interested, moderately interested or not at all interested in it

News interest - politics	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Very interested	15.6	19.8	23.6	16.7	20.3	16.2	17.4
Moderately interested	28.8	33.4	36.4	29.9	34.0	30.2	42.2
Not at all interested	54.5	45.7	38.5	52.1	45.2	51.6	39.8
DK/NA	1.1	1.1	1.5	1.3	0.4	2.0	0.6
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
News interest - new medical discoveries							
Very interested	33.4	29.7	38.7	23.0	27.9	24.4	35.8
Moderately interested	48.0	49.1	49.4	49.2	49.4	48.9	50.4
Not at all interested	17.7	20.1	10.9	26.0	22.4	24.9	12.2
DK/NA	0.8	1.2	1.0	1.8	0.4	1.8	1.6
Total	**356**	**344**	**395**	**392**	**849**	**599**	**123**
News interest - new technologies							
Very interested	24.4	24.7	36.2	26.0	25.1	21.4	34.1
Moderately interested	43.5	47.7	48.1	40.8	47.8	45.1	49.6
Not at all interested	30.9	26.5	14.4	29.6	26.3	31.2	14.6
DK/NA	1.1	1.2	1.3	3.6	0.8	2.3	1.6
Total	**356**	**344**	**395**	**392**	**849**	**599**	**123**
News interest - scientific discoveries							
Very interested	25.0	29.2	38.9	25.4	25.9	21.8	37.9
Moderately interested	33.1	34.5	32.8	31.4	36.5	35.4	36.0
Not at all interested	40.2	35.0	26.4	40.7	36.9	40.6	23.6
DK/NA	1.7	1.3	1.9	2.5	0.7	2.2	2.5
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.3: I would like you to tell me for each of the following issues in the news if you are very well informed, moderately well informed or poorly informed about it

News info level - sports	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Very well	33.8	28.1	32.0	26.1	28.3	26.1	33.5
Moderately well	26.5	30.7	28.2	30.1	29.7	25.2	31.1
Poorly	38.9	40.5	37.9	42.2	41.0	47.0	33.5
DK/NA	0.9	0.7	1.9	1.5	1.0	1.6	1.9
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
News info level - politics							
Very well	17.7	17.6	19.7	13.3	16.4	13.9	14.3
Moderately well	30.6	37.2	40.4	33.0	35.8	32.3	39.8
Poorly	49.6	44.5	38.7	51.7	46.7	51.7	44.7
DK/NA	2.1	.7	1.1	2.1	1.1	2.1	1.2
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.3 *(cont.):* I would like you to tell me for each of the following issues in the news if you are very well informed, moderately well informed or poorly informed about it

News info level - medical discoveries	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Very well	6.2	7.6	10.1	5.1	7.5	5.8	6.5
Moderately well	41.6	45.6	59.0	45.7	49.1	39.9	59.3
Poorly	51.4	45.9	28.9	46.9	41.7	52.6	32.5
DK/NA	.8	.9	2.0	2.3	1.6	1.7	1.6
Total	**356**	**344**	**395**	**392**	**849**	**599**	**123**
News info level - new technologies							
Very well	5.3	7.0	8.9	5.1	8.2	5.8	8.9
Moderately well	34.3	41.3	56.5	42.3	42.6	37.9	45.5
Poorly	58.7	49.1	32.7	49.7	47.2	53.8	43.9
DK/NA	1.7	2.6	2.0	2.8	1.9	2.5	1.6
Total	**356**	**344**	**395**	**392**	**849**	**599**	**123**
News info level - scientific discoveries							
Very well	13.9	14.0	18.0	14.6	16.7	13.9	21.1
Moderately well	23.3	32.3	42.3	27.5	31.7	27.5	32.3
Poorly	60.7	51.7	37.9	54.9	50.1	56.4	44.1
DK/NA	2.1	2.0	1.7	3.0	1.5	2.2	2.5
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.4: Now, let me ask you about your use of museums, zoos and similar institutions. Can you tell me how many times in the last twelve months you have visited each type of place that I am going to read out? If you have never been there, say "NONE"

Cultural institutions visit - science tech museum	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Visited	15.2	11.4	25.1	15.3	17.5	11.5	24.2
Never visited	84.0	88.2	74.3	82.4	82.2	88.2	75.2
DK/NA	0.9	0.4	0.6	2.3	0.4	0.2	0.6
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Cultural institutions visit - zoo aquarium							
Visited	25.9	23.4	35.6	20.8	25.9	19.2	24.8
Never visited	73.5	75.9	64.0	77.1	73.4	80.6	74.5
DK/NA	0.6	0.7	0.4	2.1	0.6	0.2	0.6
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Cultural institutions visit - natural history museum							
Visited	13.8	15.9	27.0	15.4	16.8	12.9	26.8
Never visited	84.6	82.8	71.4	79.7	81.8	86.5	71.8
DK/NA	1.7	1.3	1.5	4.9	1.4	0.5	1.4
Total	**240**	**233**	**259**	**266**	**559**	**394**	**71**

TABLE A.5.4 *(cont.)*: Now, let me ask you about your use of museums, zoos and similar institutions. Can you tell me how many times in the last twelve months you have visited each type of place that I am going to read out? If you have never been there, say "NONE"

Cultural institutions visit - public library	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Visited	32.0	30.8	27.5	30.6	22.7	25.2	36.4
Never visited	67.2	68.9	72.0	68.7	76.7	74.5	63.6
DK/NA	0.9	0.3	0.5	0.8	0.6	0.3	
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**
Cultural institutions visit - art museum							
Visited	21.9	23.7	34.6	25.1	19.0	18.2	26.4
Never visited	76.9	76.0	64.9	73.9	80.8	81.5	73.6
DK/NA	1.2	.3	.5	1.0	.2	.3	
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**

TABLE A.5.5: Here is a quick quiz. For each thing I say, please tell me if it is true or false. If you don´t know, say so, and we will skip to the next

Knowledge - centre of earth	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
True	78.6	84.0	79.9	72.2	84.3	79.7	74.5
False	4.7	4.7	6.5	8.3	4.2	7.2	10.6
DK/NA	16.7	11.4	13.6	19.5	11.5	13.1	14.9
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Knowledge - oxygen							
True	72.0	79.7	76.8	67.6	76.7	66.1	69.6
False	16.2	12.9	16.5	21.2	15.6	20.8	22.4
DK/NA	11.8	7.3	6.7	11.2	7.7	13.1	8.1
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Knowledge - radioactive milk							
True	16.9	19.2	15.9	22.0	17.2	22.3	11.2
False	55.8	55.9	56.9	47.5	51.4	46.7	56.5
DK/NA	27.4	24.9	27.2	30.5	31.4	31.1	32.3
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Knowledge - electrons							
True	38.9	43.7	40.4	42.2	41.6	41.8	42.9
False	19.0	15.6	20.5	15.7	15.5	17.8	23.0
DK/NA	42.1	40.8	39.1	42.0	42.9	40.3	34.2
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Knowledge - continents moving							
True	67.1	76.2	76.4	66.1	76.3	68.2	76.4
False	8.1	7.3	9.0	9.3	5.7	9.5	9.3
DK/NA	24.8	16.5	14.6	24.6	18.0	22.3	14.3
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.5 *(cont.)*: Here is a quick quiz. For each thing I say, please tell me if it is true or false. If you don´t know, say so, and we will skip to the next							
Knowledge - gene deciding sex	**Northwest**	**Northeast**	**Region of Madrid**	**Centre**	**East**	**South**	**Canaries**
True	46.2	37.2	42.1	33.7	43.6	43.6	56.5
False	29.7	30.3	31.4	31.8	29.7	29.0	25.5
DK/NA	24.1	32.5	26.4	34.5	26.7	27.5	18.0
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.6: Here is a quick quiz. For each thing I say, please tell me if it is true or false. If you don´t know, say so, and we will skip to the next							
Knowledge - earliest humans	**Northwest**	**Northeast**	**Region of Madrid**	**Centre**	**East**	**South**	**Canaries**
True	24.6	28.3	28.5	24.8	26.3	33.3	32.9
False	47.2	41.6	50.0	44.3	48.2	39.4	47.8
DK/NA	28.2	30.1	21.5	30.9	25.5	27.4	19.3
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Knowledge - antibiotics							
True	37.2	48.1	42.5	42.6	46.2	42.8	54.7
False	29.7	23.6	30.7	23.7	28.4	27.1	29.2
DK/NA	33.1	28.3	26.8	33.7	25.4	30.1	16.1
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Knowledge - lasers							
True	22.2	23.2	19.7	22.5	23.3	23.9	32.3
False	26.7	29.6	31.6	25.6	31.1	26.5	25.5
DK/NA	51.1	47.2	48.7	51.9	45.6	49.6	42.2
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Knowledge - radioactivity							
True	24.4	29.4	25.9	25.4	32.5	30.7	39.1
False	46.2	44.3	49.6	43.8	44.2	39.2	41.6
DK/NA	29.5	26.3	24.5	30.9	23.3	30.1	19.3
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Knowledge - human beings							
True	67.9	72.2	76.4	68.6	68.6	65.0	69.6
False	17.7	14.7	10.9	14.4	16.6	16.2	16.8
DK/NA	14.3	13.1	12.6	17.0	14.8	18.8	13.7
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.7: Does the sun go around the earth?

Knowledge earth movement - sun	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Sun orbits earth	16.0	14.7	16.1	20.3	18.5	19.7	23.0
Earth orbits sun	70.5	79.7	78.0	67.8	74.4	68.3	74.5
DK/NA	13.5	5.6	5.9	11.9	7.0	12.0	2.5
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.8: How long does it take for the earth to go around the sun?

Knowledge earth movement - time	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Year	59.2	67.7	67.0	58.9	64.1	53.2	66.5
Month	14.5	16.5	11.3	18.4	13.9	20.3	13.7
DK/NA	12.4	10.5	16.5	12.7	13.7	17.3	13.0
Inap.	13.9	5.3	5.2	10.0	8.3	9.2	6.8
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.9: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is

Science opinion economics(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Scientific	47.3	43.4	39.1	38.6	42.2	40.4	46.5
Not scientific	41.1	47.4	51.0	50.6	47.9	45.5	46.5
DK/NA	11.5	9.2	9.8	10.8	9.8	14.2	7.0
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**
Science opinion medicine(a)							
Scientific	91.1	90.8	93.2	87.5	88.4	85.5	94.6
Not scientific	3.6	5.2	3.8	6.5	5.3	5.6	2.3
DK/NA	5.3	4.0	3.0	6.0	6.3	8.9	3.1
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**
Science opinion psychology(a)							
Scientific	62.4	57.5	63.9	59.1	60.3	57.4	76.0
Not scientific	25.4	28.9	26.5	27.3	29.2	29.2	17.1
DK/NA	12.1	13.5	9.6	13.5	10.6	13.4	7.0
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**
Science opinion biology(b)							
Scientific	84.9	81.5	86.9	78.9	82.4	78.0	86.8
Not scientific	3.3	7.1	4.8	8.8	5.8	7.0	7.8
DK/NA	11.8	11.4	8.3	12.3	11.7	15.0	5.4
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**

TABLE A.5.9 *(cont.)*: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is

Science opinion astronomy(b)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Scientific	81.7	80.6	79.3	70.9	77.3	71.8	87.6
Not scientific	6.2	10.2	10.4	17.5	10.4	13.2	7.0
DK/NA	12.1	9.2	10.4	11.5	12.2	15.0	5.4
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**
Science opinion history(b)							
Scientific	45.3	34.5	38.4	38.1	35.8	35.4	45.0
Not scientific	42.6	56.0	52.8	50.6	54.4	51.2	50.4
DK/NA	12.1	9.5	8.8	11.3	9.7	13.4	4.7
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**

TABLE A.5.10: People can have different opinions about what is scientific and what is not. For each one, tell me how scientific you think it is

Science opinion physics(b)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Scientific	84.3	87.4	89.4	83.5	87.0	82.8	89.1
Not scientific	4.7	4.3	4.3	6.8	4.9	5.1	7.0
DK/NA	10.9	8.3	6.3	9.8	8.2	12.1	3.9
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**
Science opinion astrology(b)							
Scientific	54.1	60.3	47.0	55.6	51.6	59.2	62.0
Not scientific	34.3	30.8	42.4	32.8	35.5	24.4	29.5
DK/NA	11.5	8.9	10.6	11.5	12.9	16.4	8.5
Total	**338**	**325**	**396**	**399**	**843**	**627**	**129**
Science opinion mathematics							
Scientific	84.2	75.0	72.6	64.9	74.1	70.3	81.1
Not scientific	5.3	19.0	18.6	29.0	17.4	15.7	13.3
DK/NA	10.5	6.0	8.7	6.1	8.5	14.0	5.6
Total	**228**	**216**	**263**	**262**	**563**	**414**	**90**
Science opinion homeopathy							
Scientific	50.9	52.3	56.6	53.2	56.2	63.4	61.5
Not scientific	20.7	20.7	22.1	19.8	25.5	9.8	7.7
DK/NA	28.4	27.0	21.3	27.0	18.3	26.8	30.8
Total	**116**	**111**	**136**	**126**	**290**	**205**	**52**

TABLE A.5.11: Let us imagine that two scientists want to know if a certain drug is effective against a disease. In your opinion, which is the better way to test this drug?

Scientific drug test evaluation	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
1st scientist	23.0	23.4	12.7	16.5	19.9	23.9	20.8
2nd scientist	50.0	44.4	49.2	43.2	46.3	34.1	40.3
3rd scientist	16.7	13.1	13.5	14.7	11.2	15.4	15.6
DK/NA	10.4	19.2	24.6	25.6	22.6	26.5	23.4
Total	**222**	**214**	**260**	**273**	**553**	**422**	**77**

TABLE A.5.12: Suppose doctors tell a couple that their genetic make-up means that they've got a one in four chance of having a child with an inherited illness. Does this mean that?

Knowledge hereditary disease risk	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
3 children o.k.	2.8	2.7	2.6	4.0	4.6	2.5	6.4
1st child sick	5.7	5.6	4.4	5.7	5.2	5.5	6.4
Same risk each	60.5	55.6	68.4	44.8	62.3	63.2	56.0
4th child sick	9.4	12.1	6.2	4.0	6.1	4.3	11.9
DK/NA	21.6	24.0	18.4	41.5	21.9	24.5	19.3
Total	**352**	**338**	**386**	**402**	**832**	**603**	**109**

I would like to read you now some statements that people have made about science, technology or the environment. For each statement, please, tell me how much you agree or disagree.

TABLE A.5.13: "Science and technology are making our lives healthier, easier and more comfortable"

Science & technology life comfort(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	18.0	29.6	18.0	22.3	21.7	17.8	20.7
Agree some extent	49.6	47.2	48.5	47.1	49.0	51.5	47.4
Neither nor	8.0	7.5	6.1	7.9	9.1	11.0	8.1
Disagree some extent	9.2	10.3	19.5	11.8	10.8	11.0	11.9
Strongly disagree	1.0	1.3	1.5	1.7	2.7	2.0	3.7
DK/NA	14.1	4.0	6.4	9.2	6.7	6.8	8.1
Total	**411**	**398**	**456**	**467**	**973**	**709**	**135**

TABLE A.5.14: "Thanks to scientific and technological advances, the earth's natural resources will be inexhaustible"

Science & technology resources(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	5.0	5.8	2.4	5.6	3.5	5.5	9.7
Agree some extent	19.6	26.6	19.1	24.0	19.5	22.5	25.2
Neither nor	8.9	5.5	8.8	4.7	7.1	11.0	7.8
Disagree some extent	35.2	34.7	32.1	39.6	39.2	33.3	30.1
Strongly disagree	16.4	16.8	18.2	13.6	18.2	12.1	15.5
DK/NA	14.9	10.6	19.4	12.4	12.7	15.5	11.7
Total	**281**	**274**	**330**	**338**	**694**	**528**	**103**

TABLE A.5.15: "We depend too much on science and not enough on faith"

Science & technology faith(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	12.7	14.8	12.3	15.4	15.5	15.4	12.6
Agree some extent	26.8	37.7	37.3	37.5	33.4	38.6	40.0
Neither nor	10.9	10.3	11.8	10.3	11.1	12.6	11.1
Disagree some extent	18.2	18.8	15.8	16.7	19.7	15.8	16.3
Strongly disagree	8.3	6.3	9.4	4.9	9.6	4.5	11.1
DK/NA	23.1	12.1	13.4	15.2	10.7	13.1	8.9
Total	**411**	**398**	**456**	**467**	**973**	**709**	**135**

TABLE A.5.16: "Scientific and technological research cannot play an important role in protecting the environment and repairing it"

Science & technology environment(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	5.3	5.1	3.6	7.1	5.5	4.7	7.8
Agree some extent	27.4	16.8	22.4	31.7	20.5	22.0	25.2
Neither nor	6.0	8.0	5.5	5.6	7.5	11.4	7.8
Disagree some extent	27.8	41.2	27.3	30.2	41.1	36.4	35.9
Strongly disagree	18.9	19.3	20.9	13.6	13.8	12.3	15.5
DK/NA	14.6	9.5	20.3	11.8	11.7	13.3	7.8
Total	**281**	**274**	**330**	**338**	**694**	**528**	**103**

TABLE A.5.17: "Scientists should be allowed to undertake research that causes pain and injury to animals like dogs and chimpanzees if it can produce information about human health problems"

Science & technology animals(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	13.5	15.3	10.0	19.2	9.8	8.9	13.6
Agree some extent	33.1	29.9	39.7	43.5	36.5	36.0	44.7
Neither nor	8.2	4.4	6.4	4.4	7.1	9.5	10.7
Disagree some extent	18.9	30.7	19.7	15.1	20.3	18.8	19.4
Strongly disagree	13.9	11.3	12.7	8.9	17.3	15.2	5.8
DK/NA	12.5	8.4	11.5	8.9	9.1	11.7	5.8
Total	**281**	**274**	**330**	**338**	**694**	**528**	**103**

TABLE A.5.18: "Because of their knowledge, scientific researchers have a power that makes them dangerous"

Science & technology researchers(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	12.2	7.5	7.1	14.7	10.0	9.8	11.7
Agree some extent	33.7	36.6	42.6	41.0	46.0	39.3	45.6
Neither nor	6.1	6.8	6.1	5.1	7.5	6.5	6.8
Disagree some extent	25.8	26.4	21.5	22.2	17.5	21.1	15.5
Strongly disagree	10.0	9.8	11.0	5.7	6.6	8.6	9.7
DK/NA	12.2	12.8	11.7	11.4	12.4	14.6	10.7
Total	**279**	**265**	**326**	**334**	**702**	**521**	**103**

TABLE A.5.19: "The application of science and new technology will make work more interesting"

Science & technology work(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	12.9	14.0	15.0	14.4	12.1	11.1	21.4
Agree some extent	57.0	48.7	42.3	42.2	46.4	43.2	47.6
Neither nor	6.1	8.7	4.3	7.5	9.3	9.4	3.9
Disagree some extent	7.2	16.2	15.0	16.2	13.4	15.9	12.6
Strongly disagree	4.3	3.4	3.7	5.7	4.1	2.7	1.0
DK/NA	12.5	9.1	19.6	14.1	14.7	17.7	13.6
Total	**279**	**265**	**326**	**334**	**702**	**521**	**103**

TABLE A.5.20: "For me, in my daily life, it is not important to know about science"

Science & technology daily life(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	12.5	10.2	3.4	7.2	8.0	9.2	3.9
Agree some extent	25.4	32.8	30.7	32.3	29.8	32.2	40.8
Neither nor	7.2	5.7	4.3	3.3	8.0	7.9	7.8
Disagree some extent	30.8	32.8	25.5	33.2	32.3	30.1	27.2
Strongly disagree	17.9	17.0	26.1	15.9	15.0	11.1	19.4
DK/NA	6.1	1.5	10.1	8.1	7.0	9.4	1.0
Total	**279**	**265**	**326**	**334**	**702**	**521**	**103**

TABLE A.5.21: "Science makes our way of life change too fast"

Science & technology way of life(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	21.8	23.9	19.7	20.7	22.9	17.4	15.6
Agree some extent	44.7	49.9	54.4	47.7	50.3	51.4	57.0
Neither nor	6.1	6.4	6.6	6.7	8.8	8.7	8.9
Disagree some extent	8.6	11.3	8.2	9.3	10.2	10.3	5.9
Strongly disagree	1.7	2.6	3.3	4.5	1.4	2.1	6.7
DK/NA	17.1	5.9	7.7	11.0	6.4	10.1	5.9
Total	**409**	**389**	**452**	**463**	**981**	**702**	**135**

TABLE A.5.22: "Thanks to science and technology, there will be more opportunities for the future generation"

Science & technology future(a)	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Strongly agree	21.5	24.9	20.2	19.2	17.8	15.0	26.2
Agree some extent	51.3	37.7	47.2	47.3	44.6	43.6	59.2
Neither nor	5.0	5.3	4.6	6.0	6.6	9.2	2.9
Disagree some extent	8.6	19.2	12.6	9.9	10.8	13.8	4.9
Strongly disagree	3.6	1.5	3.4	4.8	3.8	3.1	
DK/NA	10.0	11.3	12.0	12.9	16.4	15.4	6.8
Total	**279**	**265**	**326**	**334**	**702**	**521**	**103**

TABLE A.5.23: In which of the following areas is the European Community itself active?

EC activities in agriculture	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Active	45.2	54.4	49.7	42.8	53.4	50.7	33.9
Non active	54.8	45.6	50.3	57.2	46.6	49.3	66.1
Total	**352**	**338**	**386**	**402**	**832**	**603**	**109**
EC activities in energy							
Active	19.9	29.3	29.8	17.7	26.4	19.7	25.7
Non active	80.1	70.7	70.2	82.3	73.6	80.3	74.3
Total	**352**	**338**	**386**	**402**	**832**	**603**	**109**
EC activities in science and technology							
Active	24.4	31.4	32.4	22.4	32.7	28.7	23.9
Non active	75.6	68.6	67.6	77.6	67.3	71.3	76.1
Total	**352**	**338**	**386**	**402**	**832**	**603**	**109**
EC activities in environment							
Active	31.0	36.7	35.2	28.1	36.9	32.7	25.7
Non active	69.0	63.3	64.8	71.9	63.1	67.3	74.3
Total	**352**	**338**	**386**	**402**	**832**	**603**	**109**
EC activities in defence							
Active	26.1	33.1	36.0	29.6	35.3	26.9	21.1
Non active	73.9	66.9	64.0	70.4	64.7	73.1	78.9
Total	**352**	**338**	**386**	**402**	**832**	**603**	**109**

TABLE A.5.24: For each of the following fields, could you tell me whether you think Europe is ahead of, behind, or at the same level as the United States?

Research EUR-USA scientific discoveries	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Ahead	5.3	6.7	8.4	5.4	8.5	6.2	9.8
Behind	66.3	63.7	66.3	66.1	64.3	65.9	52.0
Same level	13.2	15.7	17.2	10.5	12.7	13.0	22.8
DK/NA	15.2	14.0	8.1	18.1	14.5	14.9	15.4
Total	**356**	**344**	**395**	**392**	**849**	**599**	**123**

TABLE A.5.24 *(cont.)*: For each of the following fields, could you tell me whether you think Europe is ahead of, behind, or at the same level as the United States?

Research EUR-USA industry technology	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Ahead	4.8	6.1	7.3	5.9	8.6	8.5	4.1
Behind	62.9	65.4	61.8	64.5	60.4	59.9	50.4
Same level	15.7	12.5	16.7	9.9	14.3	14.5	29.3
DK/NA	16.6	16.0	14.2	19.6	16.7	17.0	16.3
Total	**356**	**344**	**395**	**392**	**849**	**599**	**123**
Research EUR-USA life technology							
Ahead	6.2	8.1	9.9	7.4	9.2	8.0	9.8
Behind	57.9	61.3	56.5	57.1	56.3	58.8	46.3
Same level	19.4	13.1	19.2	15.1	16.4	16.4	27.6
DK/NA	16.6	17.4	14.4	20.4	18.1	16.9	16.3
Total	**356**	**344**	**395**	**392**	**849**	**599**	**123**

TABLE A.5.25: Demographic indicators

Marital status	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Single	25.9	29.0	30.1	28.2	28.6	31.3	37.9
Married/living as married	61.5	59.5	57.3	60.6	58.3	56.8	47.2
Divorced/separated/widowed	12.6	11.4	12.6	10.8	12.3	11.8	14.3
DK/NA		0.2		0.4	0.8	0.1	0.6
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**
Sex							
Male	46.2	47.4	49.2	45.6	48.6	45.7	50.9
Female	53.8	52.6	50.8	54.4	51.4	54.3	49.1
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.26: How old were you when you finished your full-time education?

Age education	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
14 years or younger	42.7	40.8	30.1	44.5	42.4	46.7	29.2
15 years	5.3	3.8	4.2	4.2	4.7	4.1	6.8
16 years	6.4	8.9	8.8	8.3	10.2	7.8	5.6
17 years	4.7	6.0	4.4	3.6	4.4	3.5	11.2
18 years	8.3	7.6	8.2	5.5	8.2	6.8	10.6
19 years	2.6	2.9	4.8	2.8	3.3	2.4	2.5
20 years	3.2	2.4	5.2	3.6	3.2	2.8	1.9
21 years	3.6	2.9	2.7	0.9	2.3	2.4	4.3
22 years or older	11.5	11.1	16.5	11.0	8.8	9.0	12.4
Still studying	11.3	13.4	14.2	14.4	11.6	13.9	15.5
Never studied				0.4	0.4	0.5	
DK/NA	0.2	0.2	1.0	0.8	0.5	0.2	
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.26 *(cont.)*: How old were you when you finished your full-time education?

Age education recoded	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Up to 15 years	48.1	44.5	34.3	48.7	47.1	50.7	36.0
16-19 years	22.0	25.4	26.2	20.3	26.0	20.4	29.8
20+ years	18.4	16.5	24.3	15.5	14.3	14.2	18.6
Still studying	11.3	13.4	14.2	14.4	11.6	13.9	15.5
Never studied/na	0.2	0.2	1.0	1.1	0.9	0.7	
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.27: How old are you? (Exact years of age)

Age exact	No.	Minimum	Maximum	Mean	Std. deviation
Northwest	468	15	90	46	19
Northeast	449	15	90	44	19
Region of Madrid	522	15	93	42	18
Centre	528	15	92	44	19
East	1,122	15	87	44	19
South	808	15	93	43	19
Canaries	**161**	**15**	**75**	**39**	**17**

TABLE A.5.28: How old are you? (Exact years of age)

Age recoded - 4 groups	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
15-24	14.7	18.9	19.7	20.8	21.0	20.3	24.2
25-39	29.7	28.1	34.5	26.9	27.2	29.1	29.8
40-54	20.3	20.7	17.8	20.3	20.4	21.9	23.0
55 and more	35.3	32.3	28.0	32.0	31.4	28.7	23.0
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.29: What is your current occupation?

Occupation of respondent	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Farmer	2.4	1.6	0.2	1.5	0.6	0.5	0.6
Professional	0.9	1.6	2.1	0.2	1.2	0.7	0.6
Owners of shops-business proprietors	1.1	2.2	1.3	2.3	1.6	1.5	1.2
Owners of shops-self-employed	3.8	2.4	2.1	3.0	4.5	3.8	5.0
Business proprietors	2.4	2.0	1.3	3.0	1.7	1.4	3.7
Employed professional	1.1	1.1	4.6	1.3	1.6	2.1	1.2
General management			0.4		0.5	0.1	
Middle management	2.8	3.3	4.4	3.2	3.0	3.0	1.9
Employed at desk	4.7	2.9	8.6	3.2	5.1	4.2	5.6
Other office employed	0.9	1.6	2.5	1.7	1.2	0.7	1.2
Non-office employed	1.3	0.7	1.7	0.2	1.2	1.0	1.2
Employed but travelling	1.7	2.0	2.5	2.5	1.8	3.1	3.1

TABLE A.5.29 *(cont.):* What is your current occupation?

Occupation of respondent	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Employed but in service	2.8	3.1	3.4	3.4	3.3	3.3	5.6
Skilled manual worker	9.0	12.5	9.0	7.8	12.7	6.4	7.5
Supervisors	0.4	1.3	1.1	0.8	1.3	0.2	3.1
Other manual worker	3.8	3.8	5.0	6.1	6.8	5.8	3.1
Housewife not employed	23.1	26.5	18.0	24.4	17.2	24.9	18.6
Student	10.7	13.1	14.2	13.4	10.6	13.6	16.1
Military service		0.4					
Retired	20.1	14.7	14.0	15.7	18.0	17.0	12.4
Unemployed	7.3	3.1	3.4	6.1	5.8	6.6	8.1
DK/NA				0.2			
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.30: What is your current occupation?

Occupation of respondent - last job	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Farmer	5.0	1.2	0.4	3.4	1.8	1.1	0.8
Professional		0.2	0.2		0.5		
Owners of shops-business proprietors	0.7	0.2	0.4	0.6	0.2	0.6	0.8
Owners of shops-self-employed	0.9	0.5	0.9	0.4	0.9	0.4	
Business proprietors	1.7		0.4	0.6	0.3	0.3	0.8
Employed professional	0.9	00.7	0.9		0.4	0.6	
General management			0.4		0.2		
Middle management	0.9	0.5	1.5	1.3	0.5	1.2	0.8
Employed at desk	1.7	2.2	4.4	1.7	2.1	1.8	2.3
Other office employed	0.5	0.7	0.7	0.2	1.0	0.3	
Non-office employed	1.7	1.2	0.7	0.6	1.1	1.4	
Employed but travelling	0.7	1.0	0.7	1.0	1.4	1.1	3.1
Employed but in service	2.4	1.5	2.2	2.5	2.1	1.1	1.5
Skilled manual worker	11.1	13.9	8.4	7.1	11.4	6.5	10.7
Supervisors	0.7		1.1	0.2	1.2	0.6	0.8
Other manual worker	7.3	6.9	5.9	10.9	10.2	12.5	10.7
Never any paid work	31.4	33.5	27.7	35.4	23.4	39.6	35.9
Inap.-not 13-17 V490	32.4	35.5	43.1	34.0	41.2	31.1	32.1
Total	**423**	**403**	**455**	**477**	**984**	**727**	**131**
Type of community							
Rural/village	49.1	40.5	9.6	53.2	36.6	42.7	31.7
Small/middle town	45.3	40.8	23.6	40.7	36.5	34.0	35.4
Large town	5.6	18.7	66.9	6.1	26.7	23.1	32.3
DK/NA					0.2	0.1	0.6
Total	**468**	**449**	**522**	**528**	**1,122**	**808**	**161**

TABLE A.5.30 *(cont.):* What is your current occupation?

Occupation of respondent - last job	Northwest	Northeast	Region of Madrid	Centre	East	South	Canaries
Religion - denomination							
Roman catholic	87.6	81.4	70.1	87.2	72.0	86.3	74.8
Protestant/other christians	1.1	0.9	0.5	1.5	1.5	1.0	
Orthodox			0.8				
Jewish		0.3					
Muslim				0.5	0.1	0.2	
Buddhist					0.1		
Hindu						0.2	
Other	0.6	0.9	1.5	1.3	1.9	0.8	2.4
None/DK/NA	10.7	16.6	27.1	9.4	24.4	11.5	22.8
Total	**356**	**344**	**395**	**392**	**849**	**599**	**123**

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