

This is a postprint version of the following published document:

Ferrín, M., Fraile, M., García-Albacete, G. (2017).
The Gender Gap in Political Knowledge: Is It All
About Guessing? An Experimental Approach.
International Journal of Public Opinion Research, 29
(1) pp. 111-132

DOI: [10.1093/ijpor/edv042](https://doi.org/10.1093/ijpor/edv042)

© The Authors 2015. Published by Oxford University Press on
behalf of The World Association for Public Opinion Research. All
rights reserved.

Title: The gender gap in political knowledge: is it all about guessing? An experimental approach

Monica Ferrín (University of Zürich)

Marta Fraile * (RSCAS-EUI and CSIC-IPP)

Gema García-Albacete (Carlos III University of Madrid)

*Corresponding author (marta.fraile@eui.eu; marta.fraile@csic.es)

Abstract

This article analyzes the extent to which the format and the ‘Do not know’ protocol of political knowledge questions influence the size of the gender gap. By using a set of experiments that manipulated the DK protocol and the format (open vs. closed) of political knowledge questions in a face to face representative survey of the Spanish population, we show that the format of the questions (open versus closed) is not relevant in explaining the gender gap. DK protocols, however, influence outspoken levels of political knowledge differently for men and women. DK discouraging protocols tend to encourage the emergence of hidden knowledge among women, whereas they mostly boost guessing among men. This finding suggests that the meaning and the use of the DK option appear to be gender biased.

Keywords: political knowledge, gender gap, question format, don’t know protocol, measurement problems, guessing

ACCEPTED FOR PUBLICATION AT INTERNATIONAL JOURNAL OF PUBLIC OPINION
RESEARCH (FORTHCOMING IN 2016)

Research on public opinion suggests that the overall level of information, knowledge, and understanding of politics of the average citizen is relatively poor. Previous research also concludes that political knowledge is unequally distributed among citizens (Converse, 1964, 1970; Delli Carpini & Keeter, 1996). The public's apparent political ignorance, and its resulting incompetence in democratic actions such as voting, or other forms of political participation, has led to widespread pessimism in the academic literature. A strand of research on public opinion has recently argued, however, that this pessimism needs to be qualified (Boudreau & Lupia, 2011; Gibson & Caldeira, 2009; Lupia, 2006; Lupia & McCubbins, 1998; Prior & Lupia, 2008). According to this approach, the common analytic definition of political knowledge (citizens' ability to provide correct answers to a specific set of fact-based survey items) presents relevant problems of validity (Boudreau & Lupia, 2011), something which might result in misleading conclusions about the general public's competence and the origin and size of knowledge inequalities shown in previous studies. Among these, some of the problems mentioned by this trend in the literature relate to the format and the DK protocol of the items used to measure political knowledge (Luskin & Bullock, 2011; Miller & Orr, 2008; Mondak, 2001; Mondak & Davis, 2002; Robison 2015).

This study contributes to the debate in the literature about the effect of the format and the DK protocol on gender inequalities in knowledge identified in the literature (Burns, Schlozman & Verba, 2001; Delli Carpini & Keeter, 1996; Fraile, 2014; Frazer & Macdonald, 2003; Kenski & Jamieson, 2000; Verba, Burns & Schlozman, 1997). The contribution is threefold: First, while previous studies have dealt with these topics, very few have directly tested the effect of the question format on gender inequalities in knowledge using an experimental research design that keeps equal question content, while randomly changing the format (the sole exception is

Robison, 2015). Moreover, the potential interaction of question format and gender has attracted no attention at all. Second, we develop previous findings on the interaction between DK protocols and gender by exploring the extent to which the meaning of DK differs for men and women. Finally, we conducted experiments with five different knowledge items in a Spanish representative sample by employing a face to face survey. This is significant as to date most of the literature on the topic has come from American, British, and Canadian studies. Therefore we provide evidence from a European country, contributing to the debate and to the generalizability of the results. Finally, the experiments conducted here present a high level of external validity since the results can be inferred to the Spanish electors.

Findings show that the format of the questions (open versus closed) is not relevant in explaining the gender gap. They also show that women tend to use the DK option more than men, independently of the format and the DK protocol; a point that confirms previous studies. The novelty of our findings relates to the effects of discouraging DK. It barely encourages the emergence of hidden knowledge, but rather increases the propensity of respondents to guess. Not only this, but under the scenario of DK discouragement, men appear to guess to a greater extent than women. This finding suggests that the meaning and the use of the DK option appear to be gender biased. Therefore DK really means ‘don’t know’ for male respondents, but not for women. We discuss the implication of these findings in the last section.

The Validity of Political Knowledge Survey Items

From a methodological perspective, the validity of political knowledge measures has been evaluated in relation to several aspects: the use of the DK option (Miller & Orr, 2008; Mondak, 2001; Mondak & Anderson, 2004; Mondak & Davis, 2002; Sturgis

et al. 2008); the closed vs. open format (Luskin & Bullock, 2011; Robison, 2015); the effect of providing incentives to respondents to provide a correct answer (Prior & Lupia, 2008); the use of images vs. words (Prior, 2014); etc. Here, we focus on the type of format – open ended vs. closed ended –, and the DK protocol used to measure political knowledge. And, more specifically, on the way these different formats affects estimated levels of knowledge and gender differences in political knowledge.

Regarding the open and closed format debate, there seems to be an agreement in the literature about the advantages and disadvantages of each of the formats. Two topics are of particular relevance here. First, the ability to stimulate or dampen correct responses. While open ended questions tend to produce conservative estimations of political knowledge since some knowledgeable respondents will not provide a correct answer because they are not 100% certain (Mondak, 2001; Luskin & Bullock, 2011), closed ended questions stimulate correct answers, as respondents might try to answer even if they have only some partial knowledge about the question (they have a list of possible correct answers from which to choose). Second, the ability to incentivize guessing. While the closed format increases the propensity of respondents to guess from a list of possible answers (Luskin & Bullock, 2011), open ended questions minimize the risk of guessing to a great extent.

Regarding the protocol followed in surveys to present the DK option to the interviewee, there is still a lively debate in the literature. One line of research recommends avoiding the use of the DK option or, in the case that the option is included in the survey item, discouraging respondents to choose this option (Mondak, 2001; Mondak & Anderson, 2004; Miller & Orr, 2008; Mondak & Davis, 2002). Respondents might differ in their propensity to select DK for reasons unrelated to their real objective knowledge. For instance, individuals who are risk takers will be more

willing to guess the answer to a survey question than individuals who are risk averse. As a consequence, the presence of the DK option as a response category might underestimate/overestimate knowledge levels for some respondents. However, other studies urge caution about discouraging DK, given the risk that respondents will be more motivated to simply provide their best guess, and therefore artificially inflate general levels of knowledge (Luskin & Bullock 2011; Sturgis et al., 2008).

What are the implications of these debates for explaining the specific case of gender differences in the levels of political knowledge extensively documented in the literature (Burns *et al.*, 2001; Kenski & Jamieson, 2000; Verba *et al.*, 1997)? While previous studies have analyzed the role of the DK protocol of knowledge items in explaining part of the gender gap (Lizotee & Sidman, 2009; Mondak & Anderson, 2004), to the best of our knowledge no previous studies have explored the extent to which the format (open vs. closed) has any relevant implication for explaining the aforementioned gender gap.

Differences Between Men and Women: A Matter of Measurement?

The existence of significant gender differences in levels of political knowledge is well documented in previous research on public opinion. Numerous studies show that women tend to provide fewer correct answers than men to standard political knowledge questions not only in the US but also in Canada and Europe (Burns et. al 2001; Delli Carpini & Keeter, 1996; Fraile, 2014; Frazer & Macdonald, 2003; Kenski & Jamieson, 200; Mondak & Anderson, 2004; Verba *et al.*, 1997).

Despite many attempts in the literature to explain this gap, the question still remains unresolved and the debate is very much alive. Common explanations for gender

inequality in political knowledge point to the traditional social norms (that identify women as responsible for parenting and other caring activities); as well as to the socioeconomic disadvantages that women have traditionally suffered (Delli Carpini & Keeter, 1996; Verba, Burns & Scholzman, 1997). However, the gender gap in knowledge cannot be totally explained by considering individuals' varying resources, opportunities, and motivations (Delli Carpini & Keeter 1996). A growing body of literature suggests that gender differences might be the product of the characteristic of the items used to measure political knowledge.

One line of research argues that the gender gap (or at least part of it) is a product of the content of the items used to measure knowledge. These studies show that the majority of questions used in conventional surveys are biased in favor of men's preferences and interests (Dolan 2011; Stolle and Gidengil 2010). As a result, women do not systematically know less about politics than men, but their levels of political knowledge are constantly deflated by the traditional measures of political knowledge. In fact when knowledge is measured on political areas and issues that differ from electoral politics, such as local politics, civic rights and social policies, then the differences between men and women are reduced or even vanish (Dolan 2011; Stolle & Gidengil 2010; Shaker 2012)

Another line of research suggests that the format and design of the political knowledge survey questions is also relevant to explain (at least) part of the differences between women and men (Lizotee & Sidman, 2009; Mondak & Anderson, 2004). According to these studies, women and men tend to respond differently to political knowledge questions because women are more risk-averse than men (Frazer & Macdonald, 2003; Kenski & Jamieson, 2000; Lizotee & Sidman, 2009; Mondak & Anderson, 2004). In contrast, men take more risks and are more prone to guess what

they think is the correct answer than women (Lizotee & Sidman, 2009). Consequently, and given the different propensity of women and men to guess, women's levels of political knowledge will be smaller when open-ended items or neutral DK protocols are used—because the format and DK protocol requires more risk taking.

However what the literature has not explored yet is the possibility that the use of the DK option (and thereby its meaning) is gender biased. This is what we explore in this article: the extent to which format and DK protocols interact with gender, resulting in diverse levels of hidden knowledge for men and women.

We test two competing hypotheses. The first states that the hidden knowledge of women is more likely to appear when closed ended and DK discouraging items are used to measure political knowledge. This is because these two formats are easier than open ended and neutral DK items and entail therefore lower levels of risk when answering. To put it more succinctly, H1 states that in closed ended/ DK discouraging items, women should provide a larger number of correct answers (as they decrease the number of DK), to a greater extent than men (and as compared to open ended items/ DK neutral items). And vice-versa, men should increase the number of incorrect answers more than women, as they decrease their number of DK answers (compared to open ended items/ DK neutral items). If this is the case, the implication is that DK has different meanings for men and women.

An alternative hypothesis suggests that there will be no differences in the increase of in/correct answers between women and men, since closed ended and DK discouraging items only encourage guessing. Since the probability that women and men guess the correct answer is in theory the same (50%/50%), in close ended and DK discouraging items men and women should provide as many correct as incorrect answers, rather than DK (H2). If this hypothesis holds, the implication is that the gender

gap is independent of the type of format or DK protocol used to measure political knowledge.

Research Design and Data

To test the two aforementioned competing hypotheses we have designed a survey with the aim of assessing Spanish citizens' levels of political knowledge. A face to face survey was carried out in December 2012 on a representative sample of the Spanish population (n= 2,962), in which we experimented with some of the items intended to measure political knowledge. The sample was divided into two representative sub-samples of Spanish electors (age from 18 onwards, n= 1,481 each sub-sample).¹ As Table A.1 in the Appendix shows, the mean value of the antecedents of political knowledge (age, education, gender, political interest and sex of the interviewer) is almost identical for the two samples. This provides the experiments with a high level of external validity since the results can be generalized across Spanish electors. The first sample (questionnaire A) was used as a control group, whereas the second sample (questionnaire B) was exposed to experimental manipulation. We experimented with five political knowledge items.²

As for the closed ended vs. open ended format, we experimented with two items. The first asks for the year the Spanish constitution was signed; and the second relates to the political organization of Spanish territory. The exact same wording was used in the two questionnaires, but the open ended format was used in questionnaire A, while closed ended items were introduced in questionnaire B (see the Appendix for the specific wording, questions Q12 and Q24 respectively).

Regarding the protocol strategy to introduce the DK option, we experimented with three close ended items. The first asks about the main function of the Spanish

Parliament (Q9), the second about the Euribor (the interest rate at which banks lend money, Q21); and the third about the place where Spaniards can obtain the health card (Q26). In questionnaire A, respondents were given neither incentive nor disincentive to answer DK (DK neutral design). More specifically, they were provided with a card containing the response categories, which did not show the options DK/NA. The interviewer codified as DK all spontaneous DK responses. In questionnaire B, respondents were presented with the exact same questions and cards. However, in the case that they spontaneously answered DK, the interviewer tried to discourage the DK with a follow-up question (“Even if you are not certain, I would like you to give me your best guess”). The experimental design is particularly conservative in that we use a DK neutral protocol instead of a DK encouraging protocol (encouraging respondents to answer DK if they are not totally sure about the answer) to compare with a DK discouraging protocol. We contend that under this demanding experimental setting, any significant differences will allow for reliable conclusions.

The experiments were conducted for a number of items that differed significantly in content: from basic political facts (the year the constitution was signed) and economic figures (the question on the Euribor), to more practical matters (where to get the health card). Such a variation allows us to control for the potential effect of the content (as previously discussed, see Dolan 2011; Stolle and Gidengil 2010) in our experiment.

Finally, regarding the level of difficulty of the items, we have used a different logic for each of the two experiments. First, in the format (open vs. closed) experiment, we have kept difficulty of the two items used at a similar level. These two items can be considered to have a relatively high level of difficulty (the question on the year the Spanish constitution was signed—Q12; and the item on the political organization of

Spanish territory–Q24).³ As previously discussed, the main reason to expect an increase in the percentage of correct answers for the closed format (as compared to the open one) is that the closed format makes the response (and the possibility of guessing) easier for the interviewee. For this reason, we choose relatively difficult items and kept constant this level of difficulty for the two items.

In contrast, for the DK protocol experiment we included one item of medium/high level of difficulty (the one about the Euribor–Q21),⁴ another item of medium/low level of difficulty (the one about the main function of the Spanish Parliament–Q9),⁵ and the last item with a low level of difficulty (the one about the place where Spaniards can obtain the health card–Q26).⁶ We kept constant the format of the three items (closed ended) and varied their level of difficulty to test if the expected difference in propensity for men and women to guess - boosted by the DK discouraging protocol - is constant across diverse levels of difficulty.

Results

Starting with the first experiment, Table 1 shows percentages of DK, correct, and incorrect answers of open ended (column 2) vs. closed ended (column 3) items. Column 4 presents the differences in percentages of DK, correct, and incorrect answers between the two types of formats (questionnaires).

[Table 1 about here]

Table 1 shows that the percentage of DK answers is higher in open ended questions. And vice versa, the percentage of correct answers is higher in closed ended questions. In line with Luskin and Bullock (2011), our evidence shows that open ended items produce more conservative estimations of political knowledge, while increasing the propensity of respondents to answer DK if they are not completely sure about the

answer. Closed ended items, on the other hand, encourage respondents to give an answer, or to guess.

Table 2 presents similar results for our second experiment: the DK neutral design (column 2) vs. the DK discouraging design (column 3). Again, column 4 shows the differences in percentages of DK, correct, and incorrect answers between the two questionnaires.

[Table 2 about here]

There are significant differences between the DK neutral design and the DK discouraging design. Clearly, DK is considerably reduced, when respondents are discouraged to choose this option (questionnaire B). Logically, the magnitude of the decrease in the percentage of DK is smaller for the case of the health care item (Q26), which is the easiest one to correctly respond to (and the one that initially presents the lowest percentage of DK responses).

On the contrary, both correct and incorrect answers are increased if DK is discouraged, in two items (function of the parliament and Euribor, respectively Q9 and Q21). The magnitude of the increase in the percentage of correct answers, however, is smaller than that of the increase in the percentage of incorrect answers, when the DK discouraging design is used. This might be an indication that discouraging DK does not in fact favor the emergence of hidden knowledge, but simply increases the propensity of all respondents to guess.

Now that the descriptive evidence has been provided, we turn to the results of the test of the two previously mentioned competing hypotheses on the effect of question format and DK protocol for men and women. Our general expectation is that DK has a different meaning for men and women – real DK vs. hidden knowledge respectively

(H1). The alternative hypothesis instead states that *DK really means don't know* both for men and women (H2).

Testing H1 and H2 requires us to estimate the extent to which the effect of each treatment (the different DK protocol or the open vs. closed ended format followed in the two versions of the questionnaire) on the propensity to give a DK, correct, and incorrect answer differs for men and women. In this regard, we have created a categorical variable for each of our experiments in which DK answers take value 1, correct answers value 2, and incorrect answers value 3.

We have estimated the probabilities of providing a DK vs. correct vs. incorrect answer through a multinomial logit equation with robust standard errors for each of the five items. There are three main independent variables: treatment (closed ended vs. open ended in Table 3, DK discouraging vs. DK neutral in Table 4); gender; and the interaction between treatment and gender. The interaction term tests whether the magnitude of the treatment effect is different for women and men. Previous tests controlled for the conventional antecedents of political knowledge (abilities, motivation and resources; see for instance Delli Carpini & Keeter, 1995): education, age, and political interest, plus the sex of the interviewer, as well as interviewers' evaluations of the extent to which respondents answered political knowledge questions at random. The results regarding the treatment effect (that is, the effect of the type of questionnaire: A vs. B) show the same pattern, thus we have decided to present the results of the most simple estimation.

We proceed as follows: we first estimate the probabilities of providing a DK vs. correct vs. incorrect answer as a function of gender and the treatment for each of the five dependent variables (that is, the five knowledge items considered here), and we then specify the interaction between treatment and gender in a second step. The

empirical expectation from H1 is that in closed ended and DK discouraging items (the treatment here) women should increase the percentage of correct vs. DK answers more than men; whereas men should increase the percentage of incorrect vs. DK answers more than women. Hence we are particularly interested in the contrast between correct and DK answers; and between incorrect and DK answers. For this reason, we use DK as the baseline category in the estimations. The results of these estimations are summarized in Tables 3 and 4.

Does one type of format/ protocol tend to increase the propensity of women and men to provide a correct or incorrect answer instead of choosing the DK option? A first glance at Tables 3 and 4 suggests that only the DK protocol treatment have a differentiated statistically significant effect for men and women and for one single item – the Euribor question (Q21, see the coefficient of the interaction term in column 9 of Table 4).

[Tables 3 and 4 about here]

A correct assessment of the impact and significance of these interactions, however, cannot be completed through the direct interpretation of the multiplicative terms. This would require not only the inclusion of both constitutive terms in the estimation equation (as we do), but also the calculus of how the average marginal effect of the treatment varies for men and women. We follow Brambor, Clark and Golder (2006) and plot the change in average marginal effects of the treatment (responding to the closed versus the open item) on the expected probabilities of providing correct, incorrect and DK answers for men and women (see Figures 1 and 2). The confidence intervals around the dots indicate whether the change in probabilities of responding to each format of the questions is significant (at $p < 0.05$) for men and women separately.

Figures 1 and 2 confirm the descriptive evidence previously commented upon, that the closed ended format substantially increases the propensity of choosing the correct option instead of DK; whereas incorrect answers are much less increased for the two survey items analyzed here (compare the graph in the middle with the graph on the right for each of the two figures). Since it is unlikely that random guessing would only increase correct answers, it is an indication that multiple-choice questions in surveys might provide a more accurate measurement of political knowledge. However, is this treatment effect of an equal magnitude for women and men? The figures suggest an affirmative answer since the gender differences appear to be of a small magnitude.⁷ The evidence provided then appears to confirm H2 as regards the format of the question.

[Figures 1 and 2 about here]

Regarding the DK protocol experiments, the treatment increases the propensity to provide an incorrect answer more than it increases the propensity to provide a correct answer. This suggests that the DK discouraging protocol might bias the estimation of levels of political knowledge, since it seems to stimulate guessing.

However, is this effect of an equal magnitude for women and men? Figures 3 to 5 indicate that the effect of the DK discouraging protocol on the expected probability that respondents provide a correct answer is larger for women than for men. That is, women provide 4% and 5% more correct answers in questionnaire B than in questionnaire A; compared to 2% and 2% of men) for the question on the function of the parliament (Q9) and the Euribor (Q21) respectively (see the middle of the graphs in Figures 3 and 4). In Q26-Health card, the percentage of correct answers decreases for both men and women but the change is larger for men (2%) than for women (0.5%, see the middle of the graph in Figure 5).

When it comes to incorrect answers, H1 suggests that the DK discouraging protocol will induce a larger increase in the percentage of incorrect questions for men than for women. This is confirmed by the findings for the three items analyzed here (see right hand graphs in Figures 3 to 5). Take for example the item about the Euribor. The DK discouraging protocol increases the expected probability of providing an incorrect answer by 10% for men and 5% for women, which implies a 5% gender difference (see Figure 4). Following the same pattern, the increase in the expected probabilities of providing an incorrect answer for the items related to parliament and the health card provision are larger for men (6 and 4%) than for women (5 and 1% respectively). Although the gender differences are of a relatively small magnitude we trust the results since the experimental design we are using here is particularly conservative. In fact we compare a DK neutral protocol (instead of a DK encouraging protocol) with a DK discouraging one.

[Figures 3, 4 and 5 about here]

These findings suggest that perhaps women and men make different use of the DK option. This implies not only that women tend to use DK more than men; but also that “DK really means DK” to a greater extent for men than for women. In other words, women might use DK even if they have some partial knowledge about a topic; whereas men would tend to use DK only if they ignore the correct answer. In the following lines we discuss the implication of these findings for the validity of conventional measures of political knowledge more frequently used in previous studies.

Discussion and Concluding Remarks

Recent studies argue that a number of methodological issues could potentially question the validity of political knowledge measures. Among these, some of the

problems refer to the format and protocol of the items used in surveys. This article analyzes the extent to which the format and the DK protocol of survey questions influence part of the gender differences identified in previous studies. What is more, we test the possibility that the use and meaning of the DK option in survey knowledge items might be gender biased. Something that to the best of our knowledge has not been previously analyzed.

We use a set of experiments that manipulated the DK protocol and the format (open vs. closed) of political knowledge questions in a face to face representative survey of the Spanish population, a rarely studied case. While previous studies have examined these topics, very few have used an experimental design by maintaining equal question content, while randomly changing the format. And the sole exception (Robison, 2015) paid no attention to the potential interaction of question format and gender.

Findings suggest that the way political knowledge items are designed can potentially affect not only observed levels of knowledge but also the magnitude of the gender gap, although with some restrictions. First, results of the format experiment show that multiple choice questions in surveys provide a more accurate measurement of political knowledge than their open ended counterpart, confirming previous studies also for the case of Spain (Luskin & Bullock, 2011; Robison, 2015). This evidence appears to be of the same substantive magnitude for both men and women, thereby suggesting that the use and meaning of DK in multiple choice survey questions is equal for men and women, since responding to this type of question requires less effort from the interviewee.

Second, women say DK more often than men also in Spain. In line with previous studies (Mondak & Anderson, 2004), we interpret this finding as a product of women's higher risk aversion since the greater propensity of females to respond DK compared to

their male counterparts is clear, independently of the format or the DK protocol. However, we find an interesting qualification to this evidence. Although the DK discouraging protocol might bias the estimation of levels of political knowledge, since it seems to stimulate guessing, we also find that this evidence appears to be of a greater magnitude for males, compared to their female counterparts. Moreover the DK discouraging protocol fosters a larger increase in the percentage of incorrect questions for men than for women and a greater increase in the percentage of correct questions for women than for men.

Despite the fact that the gender differences found in the use of the DK option under the DK discouraging protocol are of a relatively small magnitude, it is important to remember that these differences arise under a very demanding experimental setting, which make the differences especially reliable. A last derivation from these findings is that the use (and perhaps the meaning) of the DK option might be different for women and men. Women appear to be more reluctant to provide an answer, even if they have some partial knowledge about a specific topic. On the contrary, men seem to answer DK when they ignore the answer to the question, suggesting that men's initial DK responses really mean that: "they do not know".

The practical implications of the analyses provided here is that when designing political knowledge questionnaires, multiple choice and DK neutral protocol are preferable because they provide a more accurate estimation of respondents' true levels of political knowledge. However this recommendation goes with some qualifications. Question content (and their consequential levels of difficulty) appear to also matter. We wonder whether the format and DK protocol driven effects observed here also translate to other knowledge items that include different content (and diverse levels of difficulty). In order to address this question, further experimental manipulation of format and

(especially) DK protocols with additional knowledge items might be the best way forward to build upon the findings presented here.

A final remark regards the potential effects of the DK protocol on other respondents. For instant, to what extent could DK also be biased for other disadvantaged groups, causing an underestimation of their levels of political knowledge? Previous empirical tests of our experiments suggest that the format or DK protocol do not appear to have an effect on levels of knowledge of other disadvantaged groups (such as the less educated or the unemployed). However, we do find that they are also more willing to provide an answer when discouraged to answer DK. Further in depth analysis would be needed in this regard and might be the subject of future research.

References

- Boudreau, Ch. & Lupia, A. (2011). Political knowledge. In J. N. Druckman, D. P. Green, J. H. Kuklinski, & A. Lupia (eds.), *Cambridge handbook of experimental political science* (pp. 171-183). Cambridge: Cambridge University Press.
- Brambor, T.; Clark, W. and Golder, M. (2006). Understanding Interaction Models: Improving Empirical Analyses. *Political Analysis*, 14(1), 63-82. doi: 10.1093/pan/mpi014.
- Burns, N., Schlozman, K. L. & Verba, S. (2001). *The private roots of public action*. Cambridge. Cambridge, MA: Harvard University Press
- Converse, P. (1964) The Nature of Belief Systems in Mass Publics. In: D. Apter (ed.) *Ideology and Discontent* (pp. 206-261) New York: Free Press.

- Converse, P. (1970) Attitudes and Non Attitudes: Continuation of a Dialogue. In: E. Tuft (ed.) *The Quantitative Analysis of Social Problems* (pp. 168-189). Reading, (Mass.): Addison-Wesley.
- Delli Carpini, M.X. & Keeter, S. (1996). *What Americans know about politics and why it matters*. New Haven: Yale University Press.
- Dolan, K. (2011). Do women and men know different things? Measuring gender differences in political knowledge. *The Journal of Politics*, 73(1), 97–107. doi:10.1017/S0022381610000897.
- Fraile, M. (2014). Do women know less about politics than men? The gender gap in political knowledge in Europe. *Social Politics*, 21(2), 261–289. doi: 10.1093/sp/jxu006
- Frazer, E. & Macdonald, K. (2003). Sex differences in political knowledge in Britain. *Political Studies*, 51(1), 67–83. doi: 10.1111/1467-9248.00413
- Gibson, J. L., & Caldeira, G. A. (2009). Knowing the supreme court? A reconsideration of public ignorance of the High Court. *The Journal of Politics*, 71(2), 429–441. doi:10.1017/S0022381609090379.
- Kenski, K., & Jamieson, K. H. (2000). The gap in political knowledge: Are women less knowledgeable than men about politics? In K. H. Jamieson (ed.), *Everything you think you know about politics . . . And why you're wrong* (pp. 83–89). New York: Basic Books.
- Lizotte, M-K., & Sidman, A. H. (2009). Explaining the gender gap in political knowledge. *Politics & Gender*, 5(2), 127–52. doi:10.1017/S1743923X09000130.
- Lupia, A. (2006). How elitism undermines the study of voter competence. *Critical Review*, 18 (1), 217 –232 . doi:10 .1080 /08913810608443658 .

- Lupia, A. & McCubbins, M. D. (1998). *The democratic dilemma: Can citizens learn what they need to know?* New York: Cambridge University Press.
- Luskin, R., & Bullock, J. G. (2011). 'Don't know' means 'don't know': DK responses and the public's level of political knowledge. *The Journal of Politics*, 73(2), 547–557. doi:10.1017/S0022381611000132.
- Miller, M. K., & Orr, S. K. (2008). Experimenting with a “Third Way” in political knowledge estimation. *Public Opinion Quarterly*, 72 (4), 768 –780 . doi:10.1093 /poq/nfn057.
- Mondak, J. J. (2001). Developing valid knowledge scales. *American Journal of Political Science*, 45(1), 224–238. doi: 10.2307/2669369
- Mondak, J.J., & Anderson, M. R. (2004). The knowledge gap: A reexamination of gender-based differences in political knowledge. *Journal of Politics*, 66(2), 492–512. doi: 10.1111/j.1468-2508.2004.00161.x
- Mondak, J. J., & Davis, B. C. (2002). Asked and answered: knowledge levels when we will not take “Do not know” for an answer. *Political Behavior*, 23(3), 199–224. doi: 10.1023/A:1015015227594.
- Prior, M., & Lupia, A. (2008). Money, time, and political knowledge: Distinguishing quick recall and political learning skills. *American Journal of Political Science*, 52 (1), 169 –183 . doi:10.1111 /j.1540 -5907 .2007 .00306 .x
- Prior, M. (2014). Visual knowledge: A different road to competence? *The Journal of Politics*, 76(1), 41-57. doi:10.1017/S0022381613001096

- Robison, J. (2015). Who knows? Question format and political knowledge. *International Journal of Public Opinion Research*, 27(1), 1-21.
doi: 10.1093/ijpor/edu019
- Shaker, L. (2012). Local political knowledge and assessments of citizen competence. *Public Opinion Quarterly* 76(3), 525-537. doi: 10.1093/poq/nfs018
- Stolle, D. & Gidengil E. (2010). What do women really know? A gendered analysis of varieties of political knowledge. *Perspectives on Politics* 8(1), 93–109.
doi: <http://dx.doi.org/10.1017/S1537592709992684>
- Sturgis, P., Allum, N., & Smith, P. (2008). An experiment on the measurement of political knowledge in surveys. *Public Opinion Quarterly*, 72(1), 90–102. doi: 10.1093/poq/nfm032
- Verba, S., Burns, N., & Schlozman, K.L. (1997). Knowing and caring about politics: Gender and political engagement. *Journal of Politics* 59(4), 1051–1072.
doi:10.2307/2998592.

Footnotes

¹ Random-strata sampling. The sampling error (at 95.5% level) was ± 1.8 . More technical details about the sample design can be found at www.cis.es.

² We introduced up to 31 different items intended to measure political knowledge. 9 items reproduce classical factual questions used in previous studies (related to electoral politics); 18 items aim at measuring knowledge about the functioning of democratic institutions (11) and specific policies (7); finally, 4 items

measure knowledge about economic institutions and processes. From all 31 items we could experiment only with 5 (due to budget restrictions).

³ The percentage of correct answers to these questions varies between 34% and 49% of total respondents (rounded percentages; see Table 1).

⁴ The percentage of correct answers to this question varies between 47% and 51% of total respondents (rounded percentages; see Table 2).

⁵ The percentage of correct answers to this question varies between 69% and 72% of total respondents (rounded percentages; see Table 2).

⁶ The percentage of correct answers to these questions varies between 78% and 80% of total respondents (rounded percentages; see Table 2).

⁷ For example, the increase in the percentage of correct answers is slightly larger for men than for women in Q12-Constitution (men provide 13% more correct answers in questionnaire B than in questionnaire A; compared to 11% of women); whereas women increase the percentage of correct answers more than men in Q24-AACC (men provide 6% more correct answers in questionnaire B than in questionnaire A; compared to 9% of women, see Figure 2). These slight gender differences however are not statistically different from zero (see the overlapping confidence interval).

List of Tables and Figures

Table 1

Percentage of DK, Correct and Incorrect responses in the two formats: Open ended vs. closed ended

	Open ended (questionnaire A)	Closed ended (questionnaire B)	Difference (questionnaire A-B)
Q12. Year of constitution			
DK	40.92	32.21	8.71***
Correct	36.93	49.29	-12.36***
Incorrect	22.15	18.50	3.65**
Q24. Number AACC			
DK	38.22	27.01	11.21***
Correct	34.57	42.67	-8.10***
Incorrect	27.22	30.32	-3.10**

Note: Our elaboration of the data CIS2973. *p<.10; **p<.05;***p<.01

Table 2

Percentage of DK, Correct and Incorrect responses in the two formats: DK Neutral vs. DK discouraging (%)

	DK neutral (questionnaire A)	DK discouraging (questionnaire B)	Difference (questionnaire A- B)
Q9. Function of parliament			
DK	14.04	6.08	7.96***
Correct	68.87	71.64	-2.77*
Incorrect	17.08	22.28	-5.2***
Q21. Euribor			
DK	32.68	21.54	11.14***
Correct	47.13	50.98	-3.85*
Incorrect	20.19	27.48	-7.29***
Q26. Health Card			
DK	3.04	1.96	1.08*
Correct	79.74	78.39	1.35
Incorrect	17.22	19.65	-2.43*

Note: Our elaboration of the data CIS2973. *p<.10; **p<.05;***p<.01

Table 3.

Probabilities of Providing a Correct vs. DK answer and an Incorrect vs. DK answer

	Q12: Constitution				Q24: AACC			
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Treatment ^a	0.529*** (0.0858)	0.0447 (0.105)	0.552*** (0.123)	-0.0297 (0.151)	0.548*** (0.0911)	0.456*** (0.0974)	0.491*** (0.133)	0.430*** (0.143)
Female	-0.513*** (0.0857)	-0.355*** (0.104)	-0.482*** (0.121)	-0.422*** (0.141)	-0.696*** (0.0912)	-0.532*** (0.0975)	-0.749*** (0.127)	-0.547*** (0.135)
Treatment*Female			-0.0537 (0.172)	0.148 (0.210)			0.110 (0.183)	0.0400 (0.196)
Constant	0.113 (0.0743)	-0.428*** (0.0889)	0.0986 (0.0864)	-0.395*** (0.0998)	0.216*** (0.0785)	-0.103 (0.0839)	0.242*** (0.0903)	-0.0927 (0.0972)
Observations	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962

Note: Our elaboration of the data CIS2973. Multinomial estimations with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

^a Open ended=0; Closed ended=1

Table 4.

Probabilities of Providing a Correct vs. DK answer and an Incorrect vs. DK answer

	Q9: Parliament Function				Q21: Euribor				Q26: Health Card			
	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect	Correct	Incorrect
Treatment ^a	0.897*** (0.137)	1.130*** (0.155)	1.014*** (0.207)	1.322*** (0.233)	0.460*** (0.0920)	0.707*** (0.108)	0.595*** (0.140)	1.015*** (0.165)	0.439* (0.248)	0.591** (0.259)	0.493 (0.309)	0.717** (0.326)
Female	-0.338*** (0.128)	-0.176 (0.147)	-0.281* (0.156)	-0.0409 (0.192)	-0.741*** (0.0919)	-0.419*** (0.108)	-0.662*** (0.122)	-0.148 (0.152)	0.761*** (0.256)	0.554** (0.267)	0.826** (0.335)	0.697** (0.354)
Treatment *Female			-0.198 (0.276)	-0.337 (0.312)			-0.208 (0.187)	-0.540** (0.218)			-0.169 (0.519)	-0.318 (0.542)
Constant	1.677*** (0.105)	0.220* (0.125)	1.644*** (0.113)	0.145 (0.141)	0.701*** (0.0796)	-0.307*** (0.0950)	0.651*** (0.0882)	-0.458*** (0.114)	2.936*** (0.180)	1.476*** (0.191)	2.917*** (0.189)	1.419*** (0.204)
Observations	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962	2,962

Note: Our elaboration of the data CIS2973. Multinomial estimations with robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

^a DK neutral=0; DK discouraging=1

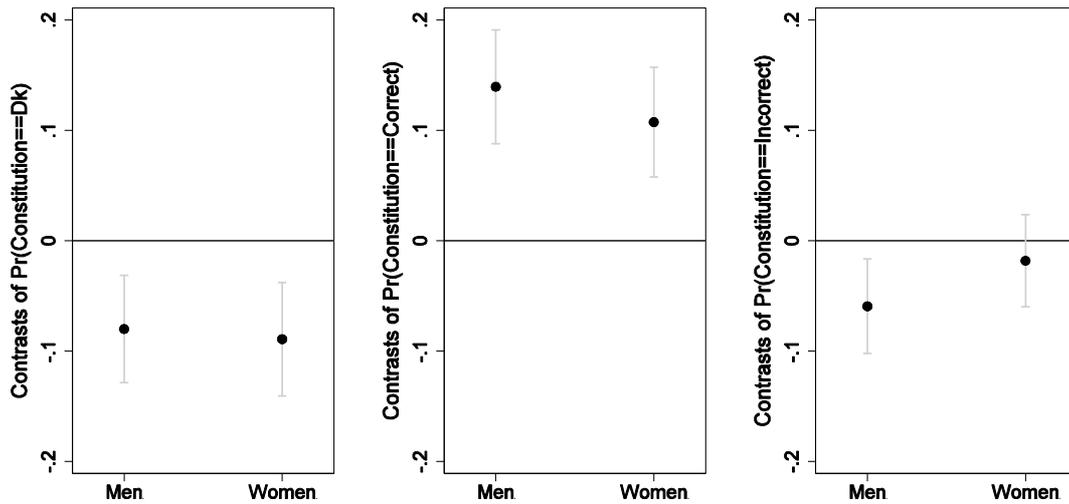


FIGURE 1. Contrast of marginal effects of the closed ended question (versus open ended question) format on the probabilities of giving a DK, correct and incorrect answer for men and women – year Constitution (Q12)

Note: Calculation on the basis of Table 3 (columns 4 and 5)

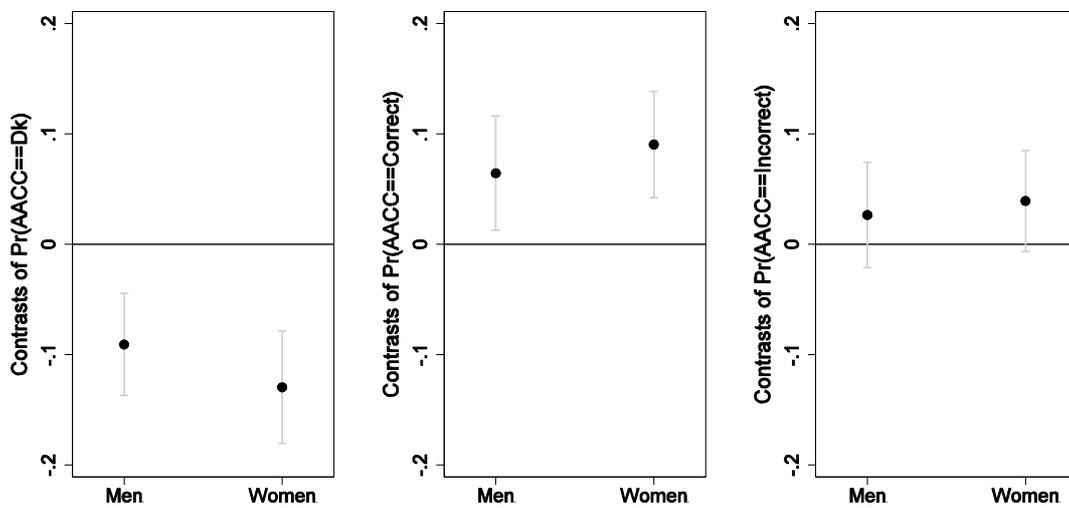


FIGURE 2. Contrast of marginal effects of the closed ended question (versus open ended question) format on the probabilities of giving a DK, correct and incorrect answer for men and women – number of Autonomous Communities (Q24)

Note: Calculation on the basis of Table 3 (columns 8 and 9)

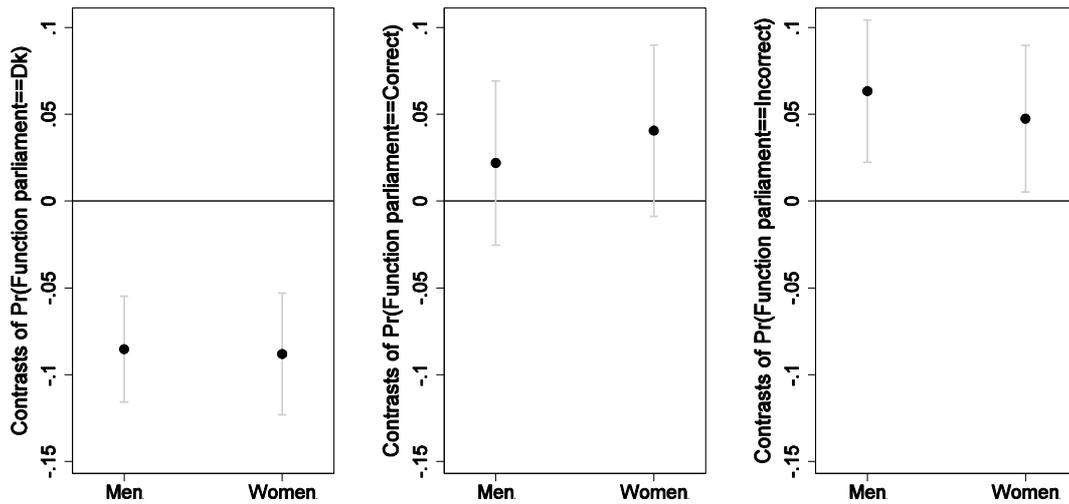


FIGURE 3. Contrast of marginal effects of the DK discouraging (versus the DKneutral) protocol on the probabilities of giving a DK, correct and incorrect answer for men and women – Function of the parliament (Q9)

Note: Calculation on the basis of Table 4 (columns 4 and 5)

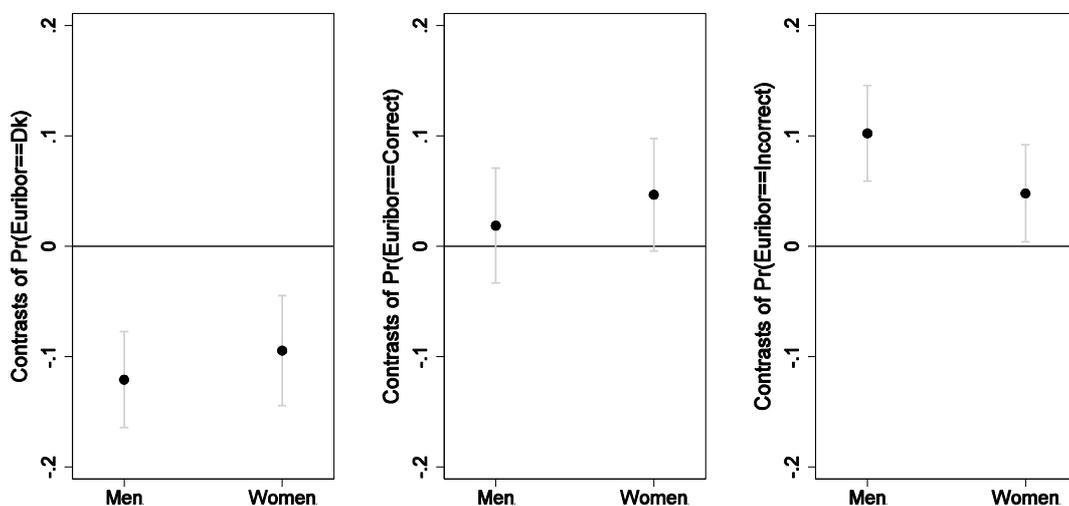


FIGURE 4. Contrast of marginal effects of the DK discouraging (versus the DK neutral) protocol on the probabilities of giving a DK, correct and incorrect answer for men and women – Euribor (Q21)

Note: Calculation on the basis of Table 4 (columns 8 and 9)

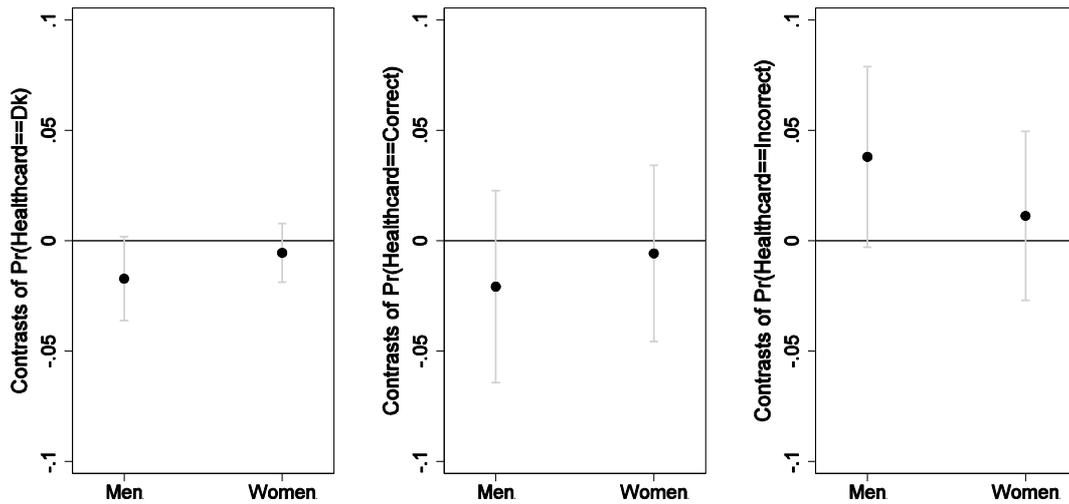


FIGURE 5. Contrast of marginal effects of the DK discouraging (versus the DK neutral) protocol on the probabilities of giving a DK, correct and incorrect answer for men and women – Health Card (Q26)

Note: Calculation on the basis of Table 4 (columns 12 and 13)

APPENDIX

Questions wording: Open vs. closed ended experiment

Q.12 Do you remember the year when the Spanish Constitution was passed?

Questionnaire A	Questionnaire B
(WRITE THE YEAR)	- 19731 - 19752 - 19783 - 19794

Q.24 Do you remember how many Autonomous Communities there are in Spain? I'm referring to Autonomous Communities, not to provinces.

Questionnaire A	Questionnaire B
(WRITE THE YEAR)	- 13 1 - 16 2 - 17 3 - 19 4 - 21 5

Questions wording: DK protocol experiment

Q.9 From the following, which is the main function of the Spanish Parliament?

Questionnaire A	Questionnaire B
- To enforce the law and arrest criminals ... 1 - To debate and pass laws.....2 - To control the courts of justice.....3 - To ensure the stability of laws4	- To enforce the law and arrest criminals ... 1 - To debate and pass laws.....2 - To control the courts of justice.....3 - To ensure the stability of laws4
-DK (not shown, used when the respondents answer5 DK spontaneously)	(IF INTERVIEWEE ANSWERS DK) Q.9b Even if you are not certain, I would like you to give me your best guess: - To enforce the law and arrest criminals ... 1 - To debate and pass laws.....2 - To control the courts of justice.....3 - To ensure the stability of laws4

Q.21 Could you tell me whether the value of the Euribor has increased, stayed the same or decreased since January 2012?

Questionnaire A	Questionnaire B
It has increased.....1 It has stayed the same.....2 It has decreased.....3	It has increased.....1 It has stayed the same.....2 It has decreased.....3
-DK (not shown, used when the respondents answers5 DK spontaneously)	(IF INTERVIEWEE ANSWERS DK) Q.21b Even if you are not certain, I would like you to give me your best guess: It has increased.....1 It has stayed the same.....2 It has decreased.....3

Q.26 Do you know where you need to go to obtain the health card?

Questionnaire A	Questionnaire B
To the city council 1 To the health center.....2 To the regional Health office3 To the citizens' information local bureau ... 4	To the city council 1 To the health center.....2 To the regional Health office3 To the citizens' information local bureau ... 4
-DK (not shown, used when the respondents answers5 DK spontaneously)	(IF INTERVIEWEE ANSWERS DK) Q.26b Even if you are not certain, I would like you to give me your best guess: To the city council 1 To the health center.....2 To the regional Health office3 To the citizens' information local bureau ... 4

Table A.1. The antecedents of Political Knowledge across the two samples

Antecedents	Sample 1 (Questionnaire A)	Sample 2 (Questionnaire B)	p value of t- test
Age (18-95)	44,13	44,41	p=0.65
Education (0-15)	5.57	5.52	p=0.62
Gender (1= female)	0.50	0.50	P=0.88
Political Interest (0-3)	1.12	1.14	p=0.45
Interviewers' sex (1= women)	0.61	0.60	p=0.54

Note: Our elaboration of the data CIS2973

APPENDIX

Questions wording: Open vs. closed ended experiment**Q.12** Do you remember the year when the Spanish Constitution was passed?

Questionnaire A	Questionnaire B
(WRITE THE YEAR)	- 19731 - 19752 - 19783 - 19794

Q.24 Do you remember how many Autonomous Communities there are in Spain? I'm referring to Autonomous Communities, not to provinces.

Questionnaire A	Questionnaire B
(WRITE THE YEAR)	- 13 1 - 16 2 - 17 3 - 19 4 - 21 5

Questions wording: DK protocol experiment**Q.9** From the following, which is the main function of the Spanish Parliament?

Questionnaire A	Questionnaire B
- To enforce the law and arrest criminals ...1 - To debate and pass laws.....2 - To control the courts of justice.....3 - To ensure the stability of laws4	- To enforce the law and arrest criminals ...1 - To debate and pass laws.....2 - To control the courts of justice.....3 - To ensure the stability of laws4
-DK (not shown, used when the respondents answer5 DK spontaneously)	(IF INTERVIEWEE ANSWERS DK) Q.9b Even if you are not certain, I would like you to give me your best guess: - To enforce the law and arrest criminals ...1 - To debate and pass laws.....2 - To control the courts of justice.....3 - To ensure the stability of laws4

Q.21 Could you tell me whether the value of the Euribor has increased, stayed the same or decreased since January 2012?

Questionnaire A	Questionnaire B
It has increased.....1 It has stayed the same.....2 It has decreased.....3	It has increased.....1 It has stayed the same.....2 It has decreased.....3
-DK (not shown, used when the respondents answers5 DK spontaneously)	(IF INTERVIEWEE ANSWERS DK) Q.21b Even if you are not certain, I would like you to give me your best guess: It has increased.....1 It has stayed the same.....2 It has decreased.....3

Q.26 Do you know where you need to go to obtain the health card?

Questionnaire A	Questionnaire B
To the city council1	To the city council 1
To the health center.....2	To the health center.....2
To the regional Health office3	To the regional Health office3
To the citizens' information local bureau4	To the citizens' information local bureau4
-DK (not shown, used when the respondents answers5 DK spontaneously)	(IF INTERVIEWEE ANSWERS DK) Q.26b Even if you are not certain, I would like you to give me your best guess: To the city council 1 To the health center.....2 To the regional Health office3 To the citizens' information local bureau4

Table A.1. The antecedents of Political Knowledge across the two samples

Antecedents	Sample 1 (Questionnaire A)	Sample 2 (Questionnaire B)	<i>p</i> value of t- test
Age (18-95)	44,13	44,41	p=0.65
Education (0-15)	5.57	5.52	p=0.62
Gender (1= female)	0.50	0.50	P=0.88
Political Interest (0-3)	1.12	1.14	p=0.45
Interviewers' sex (1= women)	0.61	0.60	p=0.54

Note: Our elaboration of the data CIS2973