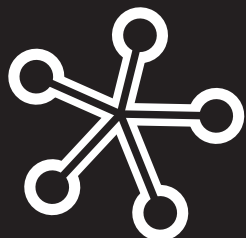




A WEBDATANET working paper

What is the gain in a probability-based online panel to provide Internet access to sampling units that did not have access before?

Melanie Revilla, Anne Cornilleau, Anne-Sophie Cousteaux, Stéphane Legleye, and Pablo de Pedraza



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© Melanie Revilla, Anne Cornilleau, Anne-Sophie Cousteaux, Stéphane Legleye, Pablo de Pedraza

General contact: aias@uva.nl

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Melanie Revilla

RECSM - Universitat Pompeu Fabra

Anne Cornilleau

Centre de données sociopolitiques (Sciences Po / CNRS)

Anne-Sophie Cousteaux

Centre de données sociopolitiques (Sciences Po / CNRS)

Stéphane Legleye

*National Institute for Demographic Studies (INED);
Inserm, U669; University Paris-Sud and University Paris
Descartes, UMR-S0669; University Paris XI*

Pablo de Pedraza

*Amsterdam Institute for Advanced Labour Studies, University of
Amsterdam; Applied Economics Department, University of Salamanca*

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Abstract

The Internet is seen as an attractive option for surveys data collection, but even if the spread of Internet continues to increase, there is still a non-coverage problem. In order to face it, one approach is to draw a probabilistic sample and then provide Internet access to the units that do not have it already. However, units without previous Internet access may not agree to participate even if provided with the necessary equipment. In this paper, we investigate what is the gain in terms of representativeness of proposing the equipment to non-Internet units in a web panel using tablets: the ELIPSS panel. We find that the number of non-Internet units accepting to participate is low. This is not only due to the fact that their response rates are lower but also to the limited proportion of non-Internet units in the French population. In addition, they also participate less in the surveys once in the panel. However, they are very different from the Internet units. Therefore, even if, because of the small number of units, the overall gain in representativeness is small, there are a few important variables (e.g. education) on which including them allows obtaining a more representative sample of the general population.

Keywords: probability-based online panel, representativeness, non-Internet units, ELIPSS panel, tablets

1 Probability-based online panels to study the general population: Attractiveness and challenges

Nowadays, the context for survey research in Europe is a challenging one. The response rates in traditional modes of data collection are going down whereas the costs are going up. At the same time, Internet became central in the life of many people. Nevertheless, even if the Internet coverage is quite high in Northern Europe (e.g. 96.5% in Iceland, 95.0% in Norway, 94.6% in Denmark, or 91.5% in Finland), it is lower in other European countries (86.2% in Germany, 83.3% in France) and even more in Southern and Eastern Europe (74.8% in Spain, 62.1% in Portugal, 58.5% in Italy, 49.8% in Romania, 41.8% in Ukraine)¹. As a consequence, using Internet to survey the general population leads to coverage issues. Indeed, the persons with Internet access differ from the ones without on several characteristics, as age, income or education (Couper, 2000; DiSogra, Callegaro and Hendarwan, 2009; Pedraza and Serrano, 2014). If these variables are highly related with the topic studied, results may be very biased. Hence, it seems necessary to include these individuals if we want to achieve a representative sample of the general population.

One way to deal with that problem consists in using a mixed-mode approach (Dillman, Reips, and Matzat, 2010) in which the sampling units who do not have Internet access are offered an alternative mode of data collection, for instance face-to-face (e.g. GESIS panel in Germany²). However, the mixed-mode design implies quite a high cost, in terms of money, time and organization. Besides, there is a risk that data coming from different modes cannot be combined due to different levels of measurement errors or social desirability (Dillman et al., 2009). Another approach consists in providing Internet to those sampling units that did not already have it. The main advantage is to have only one mode of data collection. However, the costs are often even higher than when a mixed-mode design is used. One way of dealing with this is to switch from single surveys to panels, such that the main effort of recruiting respondents only has to be made once at the beginning. Then, the same respondents can participate in different surveys. We are interested in the performance of this second solution. In these panels, the sampling units are randomly selected from the general population, independently of the fact that they have or not Internet access. Then, in order to include all units that agree to participate, Internet access (device and/or connection depending what is needed) is provided for free by the survey institute to the panellists.

At first, the idea of drawing a probability-based sample and provide the necessary equipment to answer the survey was implemented in the Netherlands in the 90s in the Telepanel (Saris, 1991, 1998). Then, when Internet appeared, a similar idea has been applied by the Knowledge Panel in the USA³ and the LISS panel in the Netherlands⁴. In both cases, if the households did not have computers and/or Internet access, they were provided with the equipment and connection. More recently, a similar approach was used to build up the German Internet Panel (GIP⁵), and the Longitudinal Internet Studies for the Social Sciences panel (ELIPSS⁶) in France. However, this last one differs on two important points from the others: all panellists were provided with a device and an Internet connection (not only the ones without previous access); and this device was a tablet (not a PC like in the other panels). Discussions are also currently underway in several countries to create similar projects, including in Norway, the United Kingdom, and Southern Europe (Spain, Italy, Greece, Cyprus, and Portugal expressed interest in creating such probability-based online panels). Even if this solution gets more and more popular, it also has some limits that researchers need to be aware of.

Indeed, what is provided is the access, but people can have access but not effectively use the Internet. Thus, a non-response bias related to the mode of data collection can still be present. Sampling units that do not have Internet access because they are reluctant to use it, do not feel able to use it, or dislike it, will probably refuse to participate in an online panel, even if provided with Internet access. Some empirical evidence supports this hypothesis: Hoogendoorn and Daalmans (2009) found that the proportion of PC owners that accepted to participate in the Dutch online CentERpanel⁷ was much higher than the proportion of non-PC-owners. Leenheer and Scherpenzeel (2013) also observed that the recruitment rates for the non-Internet households were much lower than the ones for the households with previous Internet access (35% versus 84%). If units refusing to participate differ from the ones accepting to participate, then, the panel may not be representative of the population of interest, even if it is probability-based and provides Internet access. Moreover, even if one unit accepts to participate in the panel, it does not mean that this panellist will answer every survey that will be sent. Thus, even if the panel as a whole is representative of the population of interest, the sample of respondents answering to a specific survey may not be representative, due to the non-response errors. In a longer term, attrition can also appear, with some panellists dropping of the panel, and it can also affect differently Internet and non-Internet units.

Therefore, it is necessary to study the representativeness of these panels. Dennis (2010) provides a summary of the analyses done about the representativeness of the Knowledge Panel: Knowledge Panel survey

samples are close to the U.S. Census benchmarks for primary (age, gender, race, education, and region) but also secondary demographics (marital status, number of persons in the household, employment status, home ownership...). Van der Laan (2009) looked at the representativeness of the LISS panel on household level. Comparing the LISS panel to the general population and to the well-established Labour Force Survey (LFS), he found that single person households, households with a high average age and with first generation immigrants, are underrepresented in the LISS panel. Knoef and de Vos (2009) looked at the representativeness of the LISS panel at the individual level. They showed that the composition of the LISS panel differs significantly from the Dutch population on household size, age, education, marital status, gender, and level of urbanization. Comparing the LISS with other surveys, they found that on some aspects the LISS is closer to the population (e.g. single person household) and on others not (e.g. elderly representation). Besides, they also show that the composition of respondents of specific surveys differs compared to the panel. Scherpenzeel and Betlehem (2011) also studied the representativeness of the LISS panel and compared it to a traditional survey. They concluded that “an online panel can come quite close to a traditional survey when a correct sample design is used, but the undercoverage of the elderly and the non-Internet-using population is not entirely solved by providing these households with equipment and an Internet connection in order to participate. The undercoverage is, in the case of this panel, not present in the gross sample but is caused by nonresponse: the oldest respondents were more reluctant to accept the equipment offered to them and more unwilling to participate in the online panel” (p.128). Blom, Gathmann and Krieger (forthcoming) found no major coverage or non-response biases in the GIP, even if there are some differences with the population.

So overall, it seems that even if these probability-based panels differ on some aspects from the general population, their representativeness is relatively good. Nevertheless, providing a device and/or Internet connection to the units that do not have it is a costly operation, in terms of time, organization, and money. Thus, building a probabilistic online panel in which respondents without Internet access are provided with it can appear as too costly for many survey institutes. Building a probabilistic online panel without having to provide Internet access to the units that do not have it sounds like a more realistic option knowing the time and budget constraints. Therefore, we can wonder: is there a sufficient gain, in terms of representativeness⁸, of including the units with no previous access to Internet in the panel? Is this step really crucial in getting representative online panels? Or would the representativeness already be acceptable if we would use a probability-based sample but not provide access to Internet to the units that do not have it?

This is what we want to investigate in this paper. Previous research has been looking at the specific gain of including the people without Internet access in probability-based online panels. Van der Laan (2009) found a positive effect of offering a free computer and Internet access on the representativeness of the LISS. Blom, Gathmann and Krieger (forthcoming) get a similar result for the GIP: in particular, they found that including offline households in the panel improves the representation of the elderly and female respondents. Leenheer and Scherpenzeel (2013) studied if “it pays off to include non-Internet household in an Internet panel”. “The research question that [they] address in this article is whether providing non-Internet households with a means of Internet access, which requires a substantial investment, significantly improves the quality of an Internet panel” (p.18). They conclude that, indeed, these households are answering more regularly to individual questionnaires, are less touched by the attrition and that the overall panel is closer to the population for different characteristics when this group is included.

However, as they mention themselves, “a limitation is that [their] research studies a single panel [LISS] in a country with very high Internet penetration [The Netherlands].” (p.28). In this paper, we want to investigate a similar research question but for a different country, with a lower Internet penetration (France). We assume that if the Internet penetration is lower, people’s reaction towards participating in an online panel will be more negative, but also that it will be even more important to include the non-Internet units. Moreover, we want to investigate it for an online panel with slightly different characteristics, the ELIPSS panel: first, tablets are used instead of computers. One argument in favour of this choice was that respondents might feel that it is easier to use the tablet (touch-screen, no need of the mouse, no need to install it, etc) and may agree to participate when they would not have with a PC. Second, contrary to the other probability based Internet panels, tablets and a 3G connection are offered to all panel members, not only to those who do not have previous Internet access. In this way, all ELIPSS panel members have the same device and the same browser to answer questionnaires. This design choice enables control over how questionnaires are displayed and aims for maximum measurement equivalence. We expect that these two key points can affect the results and create differences from previous studies.

In section 2, information about the ELIPSS panel is given. Then, section 3 discusses the definition of coverage/Internet access. In order to study if there is a gain in including units without previous Internet access, first, section 4 considers the gain in number of extra units at different steps of recruitment and participation to an individual survey; second, section 5 looks at the gain in terms of representativeness and participation. Finally, section 6 concludes.

2 The ELIPSS panel

The ELIPSS Panel is part of the larger project entitled *Data, Infrastructure, Methods of Investigation in the Social Sciences and Humanities* (DIME-SHS), led by Sciences Po and bringing together seven French research institutions⁹. It is a probability-based Internet panel offering social scientists a service to produce nationally representative surveys. Researchers are invited to submit survey projects during calls for proposals. From 2012 to 2014, the calls were restricted to research teams from institutions involved in the DIME-SHS infrastructure. From 2015, the calls are open to the whole French and international scientific community. Applications are evaluated by a scientific committee according to various scientific and methodological criteria. The applications eligibility is based on the scientific purpose of the project, commercial use being excluded.

As such a service to collect data for social sciences did not exist in France, a pilot study has to be set up to define the recruitment process, establish procedures for managing the panel and producing surveys, and develop software tools. The ELIPSS pilot started in 2012 and consists in 1039 panel members. The sample of 4500 housing units in metropolitan France was drawn from the census by the national statistical institute (INSEE). At the last stage, one person aged from 18 to 75 was randomly selected from the list of household members. Different contact modes were used from June 2012 to April 2013: letter, phone and face-to-face. The recruitment rate was 27% using AAPOR RECR definition (Callegaro, DiSogra, 2008).

The ELIPSS panel differs from similar survey systems in other countries by using mobile Internet as the main mode of data collection. A touchscreen tablet and 3G unlimited data plans are provided to all panel members in exchange for their participation. Thus, they can answer the questionnaires even if they did not have an Internet connection at home.

Providing tablets was expected to be an incentive to enter the panel and answer the monthly surveys. Indeed, the penetration rate for touchscreen tablets was low in France at the time of the pilot recruitment (only 9% of the households had a tablet in 2012). In this way, contrary to other probability-based Internet panels, no monthly incentives are used.

The ELIPSS annual survey aims to collect data on the socio-demographic background of panel members as well as on attitudinal and behavioural variables extensively used in the various disciplines of social sciences. A preliminary study of the representativeness has been presented (Legleye et al., 2014). Results show that the recruited sample lacks of panellists who are either aged over 64 years old or aged 18-24, have a low level of education (less than the Baccalaureate or equivalent). The sample also over-represents the

employed and students. In average, panellists located in medium-sized town or big city are less represented comparing to those in rural area or small town. These biases are classical in probability-based surveys. Fortunately, they did not grow from survey to survey.

3 Problems in defining Internet access

In order to study what is the gain in a probability-based online panel to provide an Internet connection to the units with no previous Internet access, we should first define “no previous Internet access”, keeping in mind that we are interested in knowing if one unit needs to be provided with equipment to complete web surveys or not. For years, it was implicitly assumed that to complete a web survey, respondents needed 1) a computer and 2) an Internet connection. But nowadays, smartphones and tablets coverage are increasing very quickly and even if most web surveys were not thought yet to be completed on mobile devices, a non-negligible part of the respondents are currently accessing web surveys through these devices (Peterson, 2012; Wells, Bailey and Link, 2013; de Bruijne and Wijnant, 2014; Revilla et al., 2014a).

Besides, there are many ways of “having Internet access”. You may have a modem at home or at work or simply an access to the 3G. Places (e.g. bars, restaurants, or parks) with free Wi-Fi access are more and more common. Moreover, you can use a friend or relative Internet access. Therefore, when should we consider that a person has or not “Internet access”? We could add that if fixed-PC were often considered as a household device, laptops, tablets and even more Smartphones may be more considered as a personal device. Defining the Internet connection at the household level becomes, by consequence, quite problematic. Moreover, a person with only a Smartphone can spend several hours a day on Internet, but do we consider that this is sufficient equipment to participate in a web panel? Do the respondents consider that it is sufficient equipment? On the contrary, someone without Internet connection at home who can easily answer surveys from his/her workplace, and even if we would provide him/her with an Internet connection at home, he/she will still fill in the surveys from work, should we anyway count him/her as non-Internet unit? Researchers who will set up online panels on the model of the Knowledge or the LISS panels in the future will have to define this very well in order to be the more cost-effective possible.

Because ELIPSS provided a tablet and a 3G connection to all respondents, there was no real need to define very precisely if a unit was considered as having or not Internet access. Therefore, the available information was limited and came from two sources. First, during the recruitment process, households were asked to list and describe all adult household members and to answer five questions on computer and Internet equipment at home. Second, the first survey was administered from December 2012 to March 2013 and aimed to measure Internet access, digital practices, and participation in surveys before joining the ELIPSS panel. Only 90% of panel members were invited to participate in this survey because the last

units to be recruited joined the panel in April 2013 as the first survey ended and the 2013 annual survey was being administered. To facilitate comparisons with national statistics, most of the questions of this survey come from the French survey named Information and Communication Technologies Survey (*ICT Survey*). In order to get the information for as many panellists as possible, we combined both sources of information. However, the information is not always the same for a given unit depending if we consider the answer at the recruitment stage or during the survey. There are several reasons why this can happen. First, the respondent during the recruitment may be different from the panellist, since the recruitment questions were answered by one household member who may or may not be the final panellist. Second, the formulation of the questions was a bit different at both occasions (cf. Appendix 1). In the question of the recruitment, it is possible that people did not thought about including Smartphone access; in the question of the survey, it is focused only on the “main housing”. Also, in the formulation of the question at the recruitment stage, to who the “you” refers to was unclear: was it the person answering or all the persons in the household? Third, it is possible that the situation changed, since the questions were asked at different moments. Finally, there might be measurement errors.

Because of these differences, we crossed the two sources of information and obtained four different definitions of having or not Internet access:

- *Priority Recruitment*: when we had the information from two sources and the answers differed, the answer to the recruitment is the one that determined the access. When we had the information only from the recruitment or only from the survey, we used the unique source available. So at the end, we used the answer from the recruitment to all units for which we had this information, and we completed it with the information from the survey for the units that only completed the survey.
- *Priority Survey*: the process is the same, but now when we had the information from two sources and the answers differed, the answer to the survey is the one that determined the access.
- *Priority No Access*: when we had the information from two sources and the answers differed, we considered that the unit had no access.
- *Priority Access*: when we had the information from two sources and the answers differed, we considered that the unit had access.

Because we are working with a panel, there are also different steps from the first contact during the recruitment process until the actual participation to surveys. Thus, we will differentiate the following groups: units that accepted at the level of the households (n=1335), units that sign the convention (n=1039), units

that participated to the first survey on “digital practices” (n=939). Using the different ways of classifying the panellists with respect to the access, we look at how many extra units are included at the different stages of the process.

4 How many respondents do we gain?

4.1 Having a computer at their disposal

First, we focus on the questions about access to a computer. Even if we mentioned before that mobile devices are more and more used, computers are still the main devices to answer surveys. Although mobile devices cannot be ignored anymore (because the respondents use them even if the researchers do not plan it), if a new web panel would have to decide to which units a device has to be provided, probably it would be decided that the ones who only own a Smartphone should be given another device. For the units with only tablets, this is less clear but previous research across different countries shows that there are still few web panellists who only own a tablet and no other device (Revilla et al, 2014b). Table 1 gives the frequencies and percentages of panellists that had a computer at their disposal or not before getting involved in the ELIPSS panel, for the different definitions and steps.

Table 1: Proportions of non-computer units

	Computer	Priority recruitment		Priority survey		Priority No Access		Priority Access	
		Freq	%	Freq	%	Freq	%	Freq	%
Accept									
Household	Yes	1194	89.4	1196	89.6	1175	88.0	1215	91.0
Level (n=1335)	No	141	10.6	139	10.4	160	12.0	120	9.0
Sign convention (n=1035)^(a)	Yes	950	91.8	952	92.0	931	89.9	971	93.8
	No	85	8.2	83	8.0	104	10.0	64	6.2
Answer 1st Survey (n=939)	Yes	871	92.8	873	93.0	852	90.7	892	95.0
	No	68	7.2	66	7.0	87	9.3	47	5.0

(a) The number of signed conventions is 1039 but 4 persons did not answer the question about their computer.

First, Table 1 shows that the proportion of non-computer units in the ELIPSS panel is relatively low: the maximum value is 12.0% at the household level which is lower than what we expect based on results from official statistics. For instance, according to *ICT Survey* produced by the national statistical institute (INSEE) in 2013, 14.8% of the population aged 18 to 75 years and living in metropolitan France had no computer within their households. The units without computer are under-represented in the ELIPSS panel. Second, for all definitions, we observe the same trend: the proportion of non-computer units decreases with each new step, meaning that non-computer units are participating less in the next steps: at the household level, we get acceptance of a higher proportion of household with no computer, but then this is going down when we get to the step of signing the convention and even more for the concrete participation: when we look at the participation at the first survey, the proportion of non-computer units is 9.3% if we take the maximum

across the four definitions (87 respondents), but it is only 5.0% (47 respondents) if we take the minimum. Thus, for different definitions, we have quite different results. Depending which information we use to define the panellists with or without computer access, we find that the proportion of non-computer units that could be involved in the panel by providing them access is between 47 and 87.

4.2 Internet access

Second, we make a similar analysis for Internet connection. Table 2 presents the results.

Table 2: Proportions of non-Internet units

	Internet	Priority recruitment		Priority survey		Priority No Access		Priority Access	
		Freq	%	Freq	%	Freq	%	Freq	%
Accept Household Level (n=1334)	Yes	1166	87.4	1176	88.2	1143	85.7	1199	89.9
	No	168	12.6	158	11.8	191	14.3	135	10.1
Sign Convention (n=1036)^(a)	Yes	928	89.6	938	90.5	905	87.4	961	92.8
	No	108	10.4	98	9.5	131	12.6	75	7.2
Answer 1st Survey (n=939)	Yes	853	90.8	863	91.9	830	88.4	886	94.4
	No	86	9.2	76	8.1	109	11.6	53	5.6

(a) The number of signed conventions is 1039 but 3 persons did not answer the question about Internet access.

Table 2 shows similar patterns as Table 1. There is a maximum of 14.3% of non-Internet units that accept at the household level to participate in the panel and a maximum of 12.6% of non-Internet units that really signed the convention. This is slightly higher than in the LISS panel for instance (where “9.5% of the entire panel consists of non-Internet households”, Leenheer and Scherpenzeel, 2013, p.21) but still lower than the non-Internet coverage in metropolitan France for the 18-75 years old: this percentage is 14.5% in 2013, again according to the INSEE ICT Survey.

Besides, out of the 939 respondents that answered to the first survey about digital practices, 86 had no Internet access when using the definition with priority to the recruitment, 76 when using the “Priority survey”, 109 when using the “Priority no access” and 53 when using the “Priority access”. The way to define who has or has not Internet access changes a lot the picture: using the “Priority no access” definition, there are twice as much non-Internet access respondents than using the “Priority access” definition. However, the gain of providing Internet access in terms of number of extra respondents would be relatively low, if all the units answering “yes” at least to one of the sources would have been able to participate even if they would

not have been provided with an Internet connection.

We should underline again that even if there are relatively large differences across the definitions, this may not be really incoherence, because the questions are somehow different in the recruitment and the survey, and because the questions of the recruitment were answered at the level of the household but not necessarily by the same person that at the next step was selected to participate in the panel. Besides the differences in information about the Internet access, having Internet connection at home may not be a very good indicator of being able to complete surveys on Internet. If respondents have an easy access in other places, they could also accept to participate in a web panel even if the researchers do not provide them with the equipment. In order to look at this, the next subsection looks at the frequency of connection to Internet and the place of connection of the respondents to the first survey, which was about digital practices.

4.3 Internet usage

The following question was asked to the ELIPSS panellists in the first survey: “personally, during the last three months, how frequently did you connect to Internet, whatever the place and mode of connection”. According to the INSEE ICT Survey 2013, there are 14.7% of the French population 18-75 years old that never connect to the Internet, and 65.4% that connect “every day or almost”. Using people that agreed to participate in a web panel, we expect to have less panellists answering “never” and more “every day”. But by including the non-Internet units, we assume that the differences with the benchmark survey will be reduced. Table 3 gives the cross-distribution of the frequency of connection and Internet access defined using the priority survey definition. We focus on this definition because the information about the frequency of connection to Internet comes from the survey only.

Table 3: Cross-distribution frequency of connection & Internet access (definition “priority survey”)

Internet connection		No access	Access	Total
Every day or almost	Freq.	31	708	739
	Colum%	41.3	82.1	78.9
1 to 4 days a week	Freq.	14	124	138
	Colum%	18.7	14.4	14.7
Less often	Freq.	14	17	31
	Colum%	18.7	2.0	3.3
Never	Freq.	14	10	24
	Colum%	18.7	1.2	2.6
Total^(a)	Freq.	75	862	937
	Colum%	100	100	100

(a) Five respondents did not answer to the question about frequency of Internet connection (two without Internet access and three with). They were included to compute the percentages but are not presented in the table.

First, Table 3 shows that, indeed, the proportion of panellists that connect everyday is much higher than in the benchmark survey and the one of panellists that never connect much lower. The inclusion of the non-Internet units reduces these huge differences only very slightly, which is due probably to their small number and also to their online behaviour. Indeed, within the respondents that do not have Internet access at home, still 41.3% connect to the Internet “every day or almost”, and an additional 18.7% connect “1 to 4 days a week”. One possible explanation would be that there are other places than home where a large proportion of panellists have regular access to Internet. These panellists that connect very regularly to Internet might be able to complete surveys too.

Therefore, we look next at the places from where the respondents connected to Internet during the last three months. The question is only asked to respondents that did not answer “never” to the question about the frequency of connection. Table 4 gives the frequencies and percentages of non-Internet access respondents that connected to Internet from different places.

Table 4: Percentages of non-Internet access respondents that connected from different places

All respondents that did not answer “never” for the frequency of connection to Internet	Priority survey	
	Freq	%
Home	25	41.7
Work/Studies	18	30.0
Family/friends	28	46.7
Other	9	15.0
Total	<i>60</i>	<i>100</i>

Table 4 shows that 41.7% of the respondents supposed not to have Internet connection at home connected from home in the last three months. Even if this seems incoherent, it might not be completely, because of the limits in the questions asked mentioned previously and the complexity of defining nowadays what having Internet connection means. For instance, people may not have thought about mobile web connection when asked about Internet connection at home, in the same way that people may not think about their mobile phones when they are asked if they have telephone access at home. The places of connections are asked for the last three months whereas the question about having Internet connection is asked for now. They may have connected from home with someone else Smartphone using the 3G of this someone else, and so on. Still, we probably also have some measurement errors: some respondents may have answered without reading carefully the questions or made a mistake when clicking. But the main point we want to make from this table is that part of the panellists counted as non-Internet units might in fact have a way to connect regularly to Internet from home, which would reduce even more the gain in terms of extra panellists due to providing Internet access to non-Internet units.

Besides home, quite some respondents also connected from a family or friends' place and in a smaller extent from work or the place of studies. Maybe some of them could not complete the surveys (for instance, if they can only use the Internet for things related to work) but part of them probably could. Further research would be needed to determine how many of them.

In conclusion, it is difficult to really classify panellists according to their access to Internet or not. Depending on the variables used to classify them, results can vary quite a lot. However, in the case of ELIPSS, the general picture is that the number of units that accepted to participate in the panel and had no previous computer access and/or no previous Internet access is small, mainly if we consider that part of the respondents considered as non-Internet units in fact connect daily to Internet and therefore could maybe participate in the panel even without being provided with any equipment/connection. Nevertheless, if these units differ a lot from the others, including them in the panel may still increase the overall representativeness. Thus, the next section investigates the main characteristics of the Internet and non-Internet units.

To do the analyses, we have decided to focus:

- on Internet access and not computer access or frequency of use, because we thought that the connection is more determinant nowadays than the device
- on the definition of Internet access giving the priority to the survey, because during the recruitment it might be another person from the household that answered

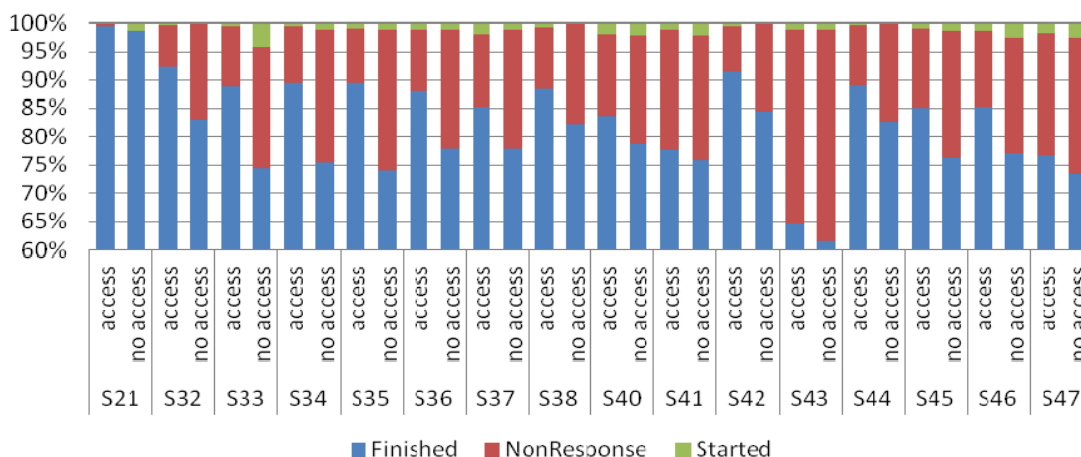
5 What are their characteristics?

5.1 In terms of participation to the panel

So far we have considered different steps of the recruitment process until the participation to the first survey about digital practices and we have seen that we lose some units at the different steps. But once the panellists have participated in one survey, are they then participating in more? Or are we losing still some units each time? In case we are losing units: does that affect the balance between Internet and non-Internet groups? Leenheer and Scherpenzeel (2013, p.19) pointed out that it is important to study “the non-Internet households’ loyalty to the panel, which relates to the long-term benefits of the investment to provide them with Internet access”. This is done by looking at the participation in the monthly questionnaires. In the LISS panel, they found that “the non-Internet households show a high degree of loyalty after they join the panel” (p.22), higher than the one of Internet households, which can be linked to the extra incentives these units have (free device and/or Internet connection, in addition to the monthly incentives for participation that all respondents receive). Even if the number of non-Internet units is limited at the creation of the panel, if they participate more regularly to the surveys, it would make it more attractive to include them. Therefore, we looked at the participation in the ELIPSS panel for the different surveys which addressed various topics such as cultural practices, political values and opinions, environment issues, the family and intergenerational relations issues, and health (see Appendix 2). From December 2012 to May 2014, sixteen surveys were administered to the ELIPSS panel, including the first survey on digital practices and the ELIPSS annual survey. The participation rate of the monthly surveys is generally above 80%¹⁰ and the attrition rate reached 9% in May 2014.

Figure 1 presents the participation to the different surveys (called S21 to S47, cf. Appendix 2 for more details about the topic, time in which the surveys were done, etc) when separating between Internet (“access”) and non-Internet units (“no access”). The surveys are ordered over time (survey S21 was the first proposed to the panellists, starting in December 2012 and S47 was the last one available when we did the analyses, proposed in May 2014).

Figure 1: Participation of invited panellists to the different surveys when separating between Internet (“access”) and non-Internet (“no access”) units



Note: we started on the vertical axis with the value 60% but everything below only corresponds to Finished. Therefore, we should read for instance, focusing on the unit with previous Internet access, that there are around 88% of the invited ones that finished survey S33, 11% of non-response and 1% that only started, whereas focusing on the non-Internet units, there are around 75% that finished S33, 21% that did not answer, and 4% that started.

Figure 1 shows that, contrary to the findings for the LISS panel, the non-Internet units in the ELIPSS panel are not more loyal. However, in the ELIPSS panel, the equipment and Internet connection were provided to all panellists and not only to the ones not yet equipped before getting in the panel. Besides, even if some panellists may have already owned a device with Internet connection, they did not necessarily own a tablet. Therefore, if the loyalty was driven in the LISS panel by the fact that the non-equipped units received a PC and/or Internet connection, it is not surprising that in the ELIPSS panel, different results are found. Since the tablets are provided to all panellists, the loyalty is expected to be similar for all of them.

According to Figure 1, the proportions of panellists invited to the different surveys that finished the questionnaires are systematically lower for the non-Internet group compared to the Internet group. Sometimes the differences are small (e.g. survey S41 on intergenerational relations), but other times, it is quite large (e.g. for S34 on cultural practices, only 75% of the invited panellists finished the survey in the non-Internet group versus 90% in the Internet group). Nevertheless, there is no clear trend over time: the differences are not increasing or decreasing, they differ from survey to survey, without a clear pattern. Still, the main result is clear: the non-Internet units tend to participate less at the aggregated level.

In order to get an idea of the individual trajectories, we also look for each panellist how many surveys he/she finished. Table 5 gives the proportions of panellists that never finished any survey, that finished from 1 to 7, from 8 to 15, and that finished all 16 surveys. However, we should notice that there are panellists who were not invited to all surveys. Indeed, some panellists started later and were not invited to answer the first survey. Also, some panellists were not available during the fieldwork of some surveys (problem with

the tablet, holidays, etc). Besides, some panel members dropped out from the panel because they wanted to or they were excluded after not having participated in five successive waves. It was observed that the non-Internet units dropped out more often from the panel than the others (19% -n=19- versus 9% -n=87-, $p<0.002$), which may be related to their lower familiarity with new technologies and the higher levels of efforts that the use of the tablet asks them.

Table 5: Proportions of panellists that finished none, 1 to 7, 8 to 15, or all surveys for Internet (“access”) and non-Internet (“no access”) units

No. finished	0 survey	1 to 7 surveys	8 to 15 surveys	16 surveys (all)	N=
Access	3.8	8.7	47.4	40.0	938
No access	11.2	16.3	35.7	36.7	98

Table 5 shows that 11.2% of the panellists without previous Internet access did not finish any survey against only 3.8% of the ones with previous Internet access. This means that, in fact, an important proportion of the non-Internet units that accepted to sign the convention never actually participated in the panel. In ELIPSS, those considered as panel members are the ones that signed the convention and received their tablet at home. One could discuss if these units that never answered should really be counted as panel members. There is also a much higher proportion of non-Internet units that did not finish more than half of the surveys (11.2+16.3=27.5% versus 3.8+8.7=12.5%). However, there is a quite similar proportion of panellists that finished all surveys in both the Internet and non-Internet groups. This suggests that there are clearly two kinds of behaviours for the non-Internet units: some behave very loyally (36.7%), but the others (63.3%) participate little on the long term (sometimes because they are dropping out). Overall, this leads to a lower participation of the non-Internet group in each individual survey. This limits the gain of including the non-Internet units in the panel. But if these units are very different in terms of socio-demographics, even if there are few and not participate much, there may be a gain in representativeness by including them. The next subsection investigates this possibility.

5.2 In terms of socio-demographic characteristics: Distributions and distance of Chi-squared

In order to have a gain in terms of representativeness of including the non-Internet units, they should have different socio-demographic characteristics. To see if this is indeed the case, we compared the characteristics of the whole group of ELIPSS panellists and the respondents of a selection of five individual surveys, with the population of interest, on a list of primary (gender, age, French nationality, education) and secondary (marital status, being in a couple, level of urbanization, employment status, housing ownership,

living in a deprived area) socio-demographics variables. We selected five surveys (S21 on digital practices, S32 on socio-demographic background, S34 on cultural practices, S41 on intergenerational relations, and S46 on European issues) because we have seen in the previous section that there are some differences in the participation to the different surveys, so it is important to consider more than one. Non Internet access was defined by our variable “priority to the survey” (see definition above).

The information from the population of interest was approximated by the results from the French Labour Force Survey (LFS) of 2012 by selecting only the respondents between 18 and 75 years old. We choose this survey because it is one of the main surveys implemented by the National Institute, well-known for its high quality and representativeness of the French population. The choice of the variables compared has been limited by the information available in this dataset.

The distributions for these variables in the panel, the different surveys and the population of interest are available in Appendix 3, when considering all respondents together or when dividing between the Internet and non-Internet units. All the distributions for the surveys are weighted using the initial weights, which correspond to the product of the weights computed by the National Institute for the selection of households by the weights computed for the selection of one individual within the household.

Comparing the distributions in the panel with the ones in the population, we observe that for some variables (e.g. gender, level of urbanization, deprived area), the distributions are very close to the ones of the LFS for the population. However, there are also some groups under-represented in the panel, in particular: 65-75 years old, respondents that do not have the French nationality, very low educated, but also the households with 2 persons, the students, and the married people. On the contrary, some groups are over-represented, e.g. 25-44 years old, single household, highest educated, respondents being in a couple, and employed people.

Now, when looking separately at the Internet and non-Internet units, we see that these two groups differ clearly on most variables. Within the non-Internet group: the age distribution is closer to the population but differs from the one of the Internet units (where the 25-44 years old are over-represented and the 65-75 under-represented); men, people living in rural areas (<2000 inhabitants), retired people, single, widowed and divorced are over-represented, as well as very low educated units (whereas they are clearly under-represented in the group with Internet access); the single-household persons are even much more over-represented than in the group with Internet access; on the contrary, people being in a couple, high

educated, employed people, are under-represented, and married people, households of more than 3 persons and house owner even more.

To get a more precise picture and summarize this huge amount of information, we computed the distance of the Chi-squared for each variable and group:

$$d^2 = \sum_{i=1}^k \frac{(\text{Observed}_i - \text{Theoric}_i)^2}{\text{Theoric}_i}$$

Because our goal was to compare this distance when the non-Internet units are or not included and for different surveys or the panel, we computed all the distances using relative frequencies (which in practice means that we computed the distance for a sample size of 100, so we used the percentages as frequencies). The smaller the Chi-squared distance is, the closer the considered group is to the population of interest, and therefore, the better is the representativeness of the group. Figure 2 shows the values of the distances of the Chi-squared for the different variables and groups. The variables are grouped depending on the maximum distances (in column 1, lowest; in column 3, highest). We should notice that for the number of persons in the household, a different scale was used for the Y axis.

Figure 2: Distance of Chi-squared for the different variables and groups



Note: S21 to S46 correspond to different surveys (see Appendix 2)

Figure 2 gives a lot of information. We will focus on some main results. First, except for the deprived area, where there are almost no differences, Figure 2 shows that the distance of the Chi-squared is usually quite different in the group without Internet access. For a majority of variables (gender, employment status, level of urbanization, house ownership, age, marital status, number of persons in the household), the distance is higher for this group, meaning that the non-Internet group is more different from the general population. However, for other variables (nationality, being in a couple, education), the distance is lower for this group, meaning that on these aspects the non-Internet units are closer to the general population. So the direction can change, but it is clear that the non-Internet units differ from the Internet units. Thus, even if there are a limited number of non-Internet units that accept to participate in the panel and really complete

the surveys, because this group is very different, the complete samples are closer to the general population than the sample of only Internet units for the variables being in a couple and education. However, for the other variables, there is no real improvement by adding the units without Internet access (the lines of the complete sample and Internet access only are confounded).

Besides, we can notice some difference between the panel and the surveys. For instance, in all three groups (whole panel, Internet units, non-Internet units), the distance for the panel for the variable “being in a couple” is quite different from the ones of the different surveys. Further research could investigate the reasons behind this phenomenon. In the panel, the shorter distance for “being in a couple” is found when looking at all panellists together, whereas in the different surveys, the smaller distances are always found for the group of non-Internet units. Finally, we also see large differences from survey to survey (e.g. for age, level of urbanization or marital status), but with no clear pattern of decrease or increase. More than a time effect, this is probably linked to the specificities of each survey (topic, period where it was spent, length both of the survey and of the fieldwork period, etc).

6 Conclusion

Using the Internet as a mode of data collection for survey research is attractive but since not all individuals have access to Internet, if one wants to study the general population, one has to face coverage issues. One solution is to provide Internet access to the units that did not had it previously. In the last years, several probability-based online panels have been created in that way. Nevertheless, there is still the problem of non-response: previous research has found that individuals without previous Internet access refuse more to participate in an online panel, even if they are provided with the equipment to do so, than individuals with previous Internet access (Leenheer and Scherpenzeel, 2013). Thus, do we really gain in representativeness by proposing to the non-Internet units to provide them Internet access if they want to participate in the panel? If not, we could envisage a web probability-based sample but in which respondents that will not have Internet access would simply select themselves out of the panel. This would be much simpler (in terms of organisation) and cheaper for the researchers.

In this paper, we have investigated these questions using the ELIPSS panel, which differs from the other probability-based online panels because it is using tablets as devices for data-collection and this equipment is provided to all panel members. The use of tablets instead of computers and the fact that every panellist gets the tablet can both affect the decisions of participation of the individuals to the panel. Therefore, it makes this study different from previous ones focusing on this question (e.g. Leenheer and Scherpenzeel, 2013).

First, we have seen that, nowadays, it is becoming quite difficult to define what “Internet access” means (with the mobile devices, the 3G development, the numerous free accesses to Wi-Fi) and how it should be measured (slightly different questions at different stages of the recruitment process lead to different answers for quite some respondents). If a survey institute only wants to provide Internet access to the units that do not have it, then, what is considered as not having it should be defined very carefully. What is really important for the research institute is to know if the units will be able to complete surveys through Internet if they are not provided with any further equipment. Thus, we would recommend asking not only about having some devices or an Internet connection in general but also directly about having the possibility to fill in surveys through Internet. This is subjective but, at the end, what the persons feel about it is going to determine their participation. Nevertheless, we would also recommend fixing some criteria about the kinds of devices (e.g. about the screen size, the operative system). Otherwise, it could lead to very incomparable answers; it could be a problem to adapt the questionnaires to some devices, etc. Thus, there should be some control on the devices accepted for completing the surveys.

In the case of the ELIPSS panel, since all panellists were provided with a tablet and 3G connection, it was not so crucial to define precisely which units had or not an Internet connection. As a result, for our analyses, depending on the information we used to classify units into the Internet and non-Internet groups, we could get quite different results. However, the general trend was clear: the number of non-Internet units participating in the panel was limited. This is also related to the size of the pilot sample and to the fact that in France, the Internet coverage is quite high. Besides, the non-Internet units were overall less loyal than the others, meaning that they participated less in the different surveys. By considering the number of surveys finished by the panellists, we could see that, in fact, around a third of the non-Internet units is very loyal (participated in all the surveys), but the others have a very low participation. Therefore, in terms of number of extra participants, providing Internet to non-Internet units seems to have a limited gain.

The non-Internet units differ quite a lot from the Internet units, on a set of primary and secondary socio-demographic variables, as indicated by the very different distributions (Appendix 3) and the differences in the distances of the Chi-squared (Figure 2). But because of their small number, adding the non-Internet units to the Internet units only reduced clearly the distances from the benchmark survey for the variables being in a couple, education, and to some extent for nationality. For the others, we do not see any real gain in the representativeness.

At the end, deciding whether to include them in the panel or not can be seen as a trade-off between costs and representativeness. Providing Internet to the non-Internet units has high costs, not necessarily so much in terms of money (for instance, there were only 66 panellists without Internet access in this study) but in terms of preparation, organisation, and maintenance of the panel (choice of the device and kind of connection, negotiation of the prices, installation in some cases at the respondents' houses, management of the devices in case some are broken, stolen, lost, etc). It requires defining very well to whom it is necessary to provide the connection and who on the contrary can do it even if we don't provide. If a mobile device is provided to non Internet units (easier to use, no installation), then, potentially, this can threaten the comparability of the data, because of the difference in screen size, portability, etc. On the other hand, if a mobile device is provided to all units, as in the ELIPSS, this solves the issue of comparability of the data and serves as an incentive for all units.

Concerning the representativeness, our results suggest that proposing equipment to the non-Internet units could improve the representativeness on a few variables, but important ones (e.g. education), which is already attractive. Nevertheless, the overall gains seem to be limited. Thus, if a new probability-based online

panel creation was planned, and the resources (money, persons working on the project, time constraints) available for this new panel would not allow to provide equipment to non-Internet units, one could think about setting up this online probability-based panel recruiting offline and without providing equipment. Then, respondents that really cannot access to Internet would select out of the panel “naturally”. Our results suggest that this would lead to a small loss in representativeness on a few characteristics, but on many others it would not harm, and this would also save a lot in terms of organisation and costs. However, this depends also on the size of the panel. The overall size of the pilot ELIPSS panel is around 1,000 units. If the size would be bigger, the gain in terms of number of extra units would be larger. Facing the investments necessary to set up a panel in which Internet equipment is provided may become more cost-effective in the case of a larger panel. Indeed, an important part of the costs (e.g. to produce surveys and disseminate data) are fixed costs. Therefore, for a small or middle size panel, it may be less attractive to include the non-Internet units, whereas for a larger size panel, it may be really more worth it.

Besides, we only considered one panel in France. Different results could be found for different countries, depending on the exact procedure chosen by the panel and the Internet coverage in the country. When the Internet coverage is low, it may be more necessary to make the investment necessary to include non-Internet units. On the other hand, when the coverage is very high, the non-Internet units will differ probably even more from the others. Therefore, more research is still needed before being able to take decisions in all countries or for different devices, incentives systems, etc.

Biographical sketches

Melanie Revilla (contact author: melanie.revilla@upf.edu) is a postdoctoral researcher at the Research and Expertise Centre for Survey Methodology (RECSM) and an associate professor at the Universitat Pompeu Fabra (UPF, Barcelona, Spain).

Anne Cornilleau (contact: anne.cornilleau@sciencespo.fr) is a research officer at the Center for Sociopolitical Data of Sciences Po (Paris, France) and is project co-leader of the ELIPSS probability-based web panel.

Anne-Sophie Cousteaux (contact: annesophie.cousteaux@sciencespo.fr) is a research officer at the Center for Sociopolitical Data of Sciences Po (Paris, France) and is project co-leader of the ELIPSS probability-based web panel.

Stéphane Legleye (contact: stephane.legleye@ined.fr) is head of the Survey and Sampling Department at the INED which takes part in the ELIPSS project and associate researcher at the INSERM U669 and U1018.

Pablo de Pedraza (contact: p.depedraza@uva.nl) works at the Amsterdam Institute for Advanced Labour Studies, University of Amsterdam, and the Applied Economics Department of the University of Salamanca. He is the Chair of Webdatanet (EU Cost Action). He conducts research in labor economics, job insecurity, life satisfaction and bias and post adjustment techniques in international web surveys.

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Endnotes

- 1 Source: <http://www.internetworldstats.com/stats4.htm#europe>, penetration 31 December 2013
- 2 <http://www.gesis.org/en/services/data-collection/gesis-panel/>
- 3 <http://www.knowledgenetworks.com/knpanel/KNPanel-Design-Summary.html>
- 4 http://www.lissdata.nl/lissdata/About_the_Panel
- 5 http://reforms.uni-mannheim.de/internet_panel/home/
- 6 <http://quanti.dime-shs.sciences-po.fr/>
- 7 <http://www.centerdata.nl/en/about-centerdata/what-we-do/data-collection/centerpanel>
- 8 Many definitions of representativeness exist (Kruskal and Mosteller, 1979a,b,c). In this paper, we define representativeness with respect to specific variables: for instance, we will consider that the panel is representative with respect to gender if the distribution of the variable gender in the panel is similar to the one in the population of interest.
- 9 DIME-SHS has received 10.4 million euros in funding from the French National Agency for Research (ANR-10-EQPX-19-01) for the 2011-2019 period.
- 10 The pre-municipal survey in March 2014 (S43) experienced a rate of 64%. This lower rate can be attributed to the shorter fieldwork period. It was the first time that the panel members had two weeks to answer instead of one month.

Appendix 1: Questions

During the recruitment, the questions were asking if:

- the household had at its disposal one or more computers
- they had at their disposal an Internet connection from their homes.

In the first survey, the questions were asking if:

- the household had at its disposal one computer in the main housing
- from their main housing, before their participation in the ELIPSS panel, someone from their household had access to Internet (including from a laptop or Smartphone)

Appendix 2: List of all the surveys done in ELIPSS until May 2014 with short name, main topic, announced length, and time of fieldwork

Name	Topic	Length (minutes)	Starting date	End date
S21	Tutorial to use the tablet/ Digital practices in 2013	15	17/12/2012	06/03/2014
S32	2013 ELIPSS Annual survey (part 1)	20	04/04/2013	06/06/2013
S33	2013 ELIPSS Annual survey (part 2)	20	02/05/2013	06/06/2013
S34	Cultural participation and preferences	30	06/06/2013	11/07/2013
S35	Sexual and reproductive health	30	12/07/2013	05/09/2013
S36	Electoral choices and political values (1st wave)	30	05/09/2013	07/10/2013
S37	Attitudes towards environment and Schwartz values	30	03/10/2013	07/11/2013
S38	Partnership arrangements and views on family issues	30	05/11/2013	10/12/2013
S40	The sanitary impact of exposure to inorganic particles / Electoral choices and political values (2nd wave)	30	12/12/2013	06/02/2014
S41	Conception of the norms related to family solidarity between generations	25	06/02/2014	06/03/2014
S42	2014 ELIPSS Annual survey	25	06/03/2014	14/04/2014
S43	Electoral choices and political values (3rd wave)	5	06/03/2014	21/03/2014
S44	Stanford multi-national study of questionnaire design	10	03/04/2014	12/05/2014
S45	Electoral choices and political values (4th wave)	5	03/04/2014	28/04/2014
S46	International panel comparison study (GESIS Panel, GIP, LISS, ELIPSS) / Digital practices in 2014	25	07/05/2014	05/06/2014
S47	Electoral choices and political values (5th wave)	5	07/05/2014	23/05/2014

Appendix 3: Distribution of socio-demographic variables in the population and the ELIPSS panel and surveys (weighted by initial weights)

	Panel		Survey 21		Survey 32		Survey 34		Survey 41		Survey 46								
	All	Access	No	All	Access	No	All	Access	No	All	Access	No							
N^(b)	964	877	84	921	846	75	925	847	78	893	820	71	771	701	68	801	735	63	
Gender																			
Men	48.23	48.03	47.09	55.95	51.32	50.83	58.60	51.07	50.38	60.67	50.48	50.17	54.84	51.66	51.36	55.40	49.36	49.52	46.98
Women	51.77	51.97	52.91	44.05	48.68	49.17	41.40	48.93	49.62	39.33	49.52	49.83	45.16	48.34	48.64	44.60	50.64	50.48	53.02
Age																			
18-24	11.89	9.38	9.39	9.52	12.37	12.40	11.83	12.23	12.24	12.19	12.13	12.24	10.57	11.21	11.75	4.60	12.06	12.52	5.07
25-34	14.94	20.33	20.62	17.86	19.16	18.80	24.49	19.39	19.1	23.47	18.86	18.09	29.53	18.43	17.26	32.84	17.76	17.26	25.32
35-44	18.68	24.82	25.54	17.86	24.45	24.76	19.88	24.57	24.61	24.05	24.37	24.77	18.69	24.00	23.79	26.58	23.53	23.58	22.78
45-54	20.09	21.17	21.19	20.24	20.83	21.24	14.78	20.29	20.76	13.85	20.64	21.15	13.47	21.01	21.75	11.88	22.33	22.67	17.11
55-64	19.47	17.10	16.84	19.05	17.22	17.54	12.59	17.05	17.41	11.95	17.73	18.11	12.54	18.99	20.00	6.61	18.14	18.76	8.73
65-75	14.93	7.19	6.41	15.48	5.98	5.26	16.43	6.46	5.89	14.49	6.27	5.63	15.2	6.35	5.45	17.5	6.17	5.2	20.98
Nationality																			
French born	89.43	90.91	90.83	91.57	90.14	90.23	88.73	90.43	90.78	85.57	90.81	90.95	88.78	91.29	91.77	85.17	91.13	91.23	89.58
French obtained	4.27	5.22	5.39	3.61	6.69	6.78	5.32	6.15	6.23	5.05	5.99	6.04	5.29	5.77	5.87	4.49	5.86	5.89	5.44
Stranger	6.30	3.87	3.78	4.82	3.18	2.99	5.95	3.42	3.00	9.38	3.21	3.01	5.93	2.94	2.36	10.34	3.01	2.88	4.98
Number of person in the household																			
1	15.7	26.07	23.60	51.19	16.93	14.90	46.66	16.95	14.82	46.73	16.95	15.05	43.45	17.24	15.30	41.16	17.55	15.77	44.59
2	34.96	25.86	25.32	32.14	23.83	23.21	32.86	24.29	23.60	33.83	23.79	22.66	39.61	25.31	24.16	39.48	24.03	23.30	35.06
3	19.04	17.73	18.79	5.95	22.33	23.22	9.27	22.16	23.11	8.80	23.44	24.46	9.11	21.95	23.35	4.71	23.03	24.17	5.65
4	19.22	20.33	21.88	4.76	26.72	28.07	6.96	26.75	28.19	6.60	25.99	27.52	4.67	24.50	25.92	6.98	24.50	25.57	8.37
5+	11.08	10.01	10.42	5.95	10.19	10.59	4.26	9.85	10.27	4.04	9.83	10.31	3.17	10.99	11.26	7.67	10.89	11.19	6.33

	Panel			Survey 21			Survey 32			Survey 34			Survey 41			Survey 46			
	EE2012 ^(a)	All	Access	No	All	Access	No	All	Access	No	All	Access	No	All	Access	No			
In a couple																			
Yes	65.54	72.89	74.91	51.19	77.97	79.34	57.97	78.35	79.58	61.16	78.11	79.31	61.41	77.94	78.58	70.10	78.56	79.60	62.89
No	34.46	27.11	25.09	48.81	22.03	20.66	42.03	21.65	20.42	38.84	21.89	20.69	38.59	22.06	21.42	29.9	21.44	20.40	37.11
Education – higher diploma																			
None/CEP/BEPC	31.57	17.52	15.81	35.71	16.56	15.32	34.76	17.58	16.16	37.35	16.13	14.99	31.98	16.11	15.08	28.81	16.38	15.65	27.45
CAP/BEP	23.51	20.65	19.59	32.14	20.14	19.05	36.09	20.43	19.45	34.07	20.9	19.74	37.10	21.45	20.43	33.99	18.50	17.60	32.19
Bac	19.24	19.4	19.93	14.29	20.15	20.45	15.69	19.92	20.22	15.8	20.09	20.17	19.01	21.04	20.68	25.54	21.92	21.67	25.70
Bac+2	11.26	17.31	17.98	9.52	20.34	21.27	6.78	19.50	20.44	6.43	19.52	20.48	6.14	18.86	19.85	6.63	19.83	20.56	8.64
Bac+3 et plus	14.42	25.13	26.69	8.33	22.81	23.92	6.68	22.56	23.72	6.34	23.35	24.61	5.77	22.53	23.95	5.03	23.37	24.51	6.03
Level of urbanization																			
Rural	24.69	25.70	25.27	30.61	27.44	26.69	38.83	27.78	27.13	36.86	27.13	26.7	33.06	26.05	25.63	31.25	27.25	26.88	33.06
20000-9999	11.85	7.22	7.14	8.16	11.72	11.54	14.48	10.10	9.84	13.74	11.14	10.47	20.47	12.1	11.12	24.50	11.84	11.48	17.41
100000-49999	10.98	13.28	13.11	15.31	9.17	9.00	11.79	9.52	9.31	12.46	9.65	9.37	13.63	9.10	9.00	10.47	9.89	9.53	15.50
500000-199999	12.12	12.99	13.33	9.18	8.60	8.85	4.78	8.81	9.12	4.53	8.84	9.18	4.17	9.49	9.88	4.67	9.44	9.72	5.16
2000000-1999999	24.72	24.45	24.41	24.49	29.18	29.73	20.85	29.92	30.63	20.01	28.97	29.71	18.67	29.69	30.82	15.31	26.99	27.63	17.05
Paris area	15.65	16.36	16.74	12.24	13.89	14.19	9.28	13.87	13.98	12.40	14.26	14.57	10.01	13.57	13.55	13.80	14.59	14.77	11.82
Employment status																			
Employed	61.06	66.16	67.77	48.72	64.38	65.16	52.92	64.01	64.97	50.52	64.54	65.37	52.12	62.65	63.28	53.82	63.61	64.09	55.11
Studying	7.54	4.65	4.60	5.13	6.26	6.4	4.27	6.12	6.27	3.99	6.47	6.63	4.15	5.80	6.03	2.71	6.44	6.64	2.82
Unemployed	8.03	7.46	7.32	8.97	8.84	8.84	8.95	8.76	8.66	10.06	8.37	8.30	9.41	9.19	8.99	11.97	8.34	8.31	8.88
Retired	15.58	15.14	14.17	25.64	14.09	13.34	25.11	14.36	13.7	23.51	14.54	13.72	26.78	15.6	15.00	23.95	15.24	14.42	29.62
Housewife/husband	4.53	4.22	4.01	6.41	4.29	4.19	5.73	4.55	4.23	9.10	3.99	3.89	5.38	4.33	4.27	5.22	4.03	4.22	0.69
Other inactive	3.25	2.38	2.13	5.13	2.13	2.07	3.02	2.2	2.16	2.83	2.09	2.09	2.16	2.44	2.44	2.33	2.35	2.32	2.88
Marital status																			
Single	37.01	40.00	38.61	55.13	38.83	37.50	58.18	38.83	37.52	57.12	38.8	37.44	59.07	38.03	36.94	53.31	36.88	36.15	49.79
Married	50.88	44.97	47.34	19.23	50.54	52.52	21.63	50.32	52.21	23.98	50.42	52.42	20.62	51.37	52.94	29.56	51.85	53.21	27.96
Divorced	8.53	12.32	11.69	19.23	8.53	8.15	14.06	8.80	8.48	13.17	8.79	8.45	13.78	8.58	8.35	11.72	9.33	9.04	14.50
Widowed	3.58	2.70	2.36	6.41	2.10	1.82	6.12	2.05	1.79	5.73	2.00	1.70	6.53	2.02	1.77	5.41	1.94	1.61	7.75

	Panel		Survey 21		Survey 32		Survey 34		Survey 41		Survey 46								
	EE2012 ^(a)	All	Access	No	All	Access	No	All	Access	No	All	Access	No						
House ownership																			
Owner	63.8	59.00	61.62	34.69	66.79	68.54	40.13	67.20	69.28	38.09	67.53	69.61	38.84	67.35	69.80	36.24	68.24	69.94	41.91
No	36.2	41.00	38.38	65.31	33.21	31.46	59.87	32.80	30.72	61.91	32.47	30.39	61.16	32.65	30.20	63.76	31.76	30.06	58.09
Deprived area																			
No	95.35	94.42	94.58	92.86	95.72	95.77	94.9	95.86	95.83	96.21	96.04	96.11	95.11	95.9	95.98	94.87	96.02	96.16	93.84
Yes	4.65	5.58	5.44	7.14	4.28	4.23	5.10	4.14	4.17	3.79	3.96	3.89	4.89	4.10	4.02	5.13	3.98	3.84	6.16

Note: EE2012 is the French Labor Force Survey of 2012. We use this survey (focus on the 18-75 years old) as best approximation of the values for the population of interest. N provides an approximation of the numbers of observations, but, because of missing values, they vary a bit for the different variables.

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Amsterdam Institute for Advanced labour Studies

University of Amsterdam

Postal address: PO Box 94025 • 1090 GA Amsterdam • The Netherlands

Visiting address: Nieuwe Prinsengracht 130 • 1018 VZ Amsterdam • The Netherlands

Tel +31 20 525 4199 • Fax +31 20 525 4301

aias@uva.nl • www.uva-aias.net