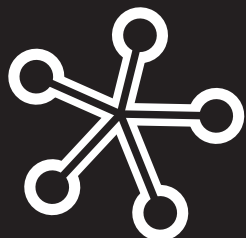




A WEBDATANET working paper

Who has access to mobile devices in an online commercial panel?

*Melanie Revilla, Daniele Toninelli,
Carlos Ochoa and Germán Loewe*



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General contact: aias@uva.nl

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Who has access to mobile devices in an online commercial panel?

An analysis of potential respondents for mobile surveys

Melanie Revilla

RECSM - Universitat Pompeu Fabra

Daniele Toninelli

University of Bergamo

Carlos Ochoa

Netquest

Germán Loewe

Netquest

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Table of contents

ABSTRACT	7
1 INTRODUCTION	9
2 INTERNET COVERAGE AND MOBILE WEB ACCESS	11
3 NEW EVIDENCE FROM THE NETQUEST PANEL	17
3.1 Owning different devices	17
3.2 Combination of devices	19
3.3 Access to different devices	21
4 DIFFERENCES ACROSS GROUPS: LOGISTIC REGRESSION ANALYSIS	23
5 CONCLUSIONS	25
REFERENCES	27
APPENDICES	29
AIAS WORKING PAPERS	31

Abstract

Nowadays, the large majority of web surveys are done through non probabilistic-based panels, in which people volunteer to participate. We expect that the spread of mobile devices differs in these panels, if compared to the general population. However, little is known about the exact spread of mobile devices (tablets and smartphones) within the panellists of access panels, and about their combination. Nevertheless, this is crucial information since they represent the majority of web surveys and since the participation of the panellists in these surveys is conditioned by the equipment they own. To get a more precise idea of the proportion of potential respondents through mobile devices in access panels, we study data from Netquest. The aim is mainly to evaluate the current spread of devices and their combination in countries not studied before: Spain, Portugal and Latin American countries. The results suggest that mobile devices (mainly smartphones) are spreading very quickly in these countries. Moreover, most panellists have more than one kind of devices at their disposal. Therefore, the mobile participation to surveys is potentially becoming more and more relevant, but the real participation through mobile depends also on which device panellists prefer to use when they have the choice.

1 Introduction

It is clear that the spread of mobile devices (in particular smartphones and tablets) in the general population has increased very quickly in the last years, changing the people's habits of accessing and using the web. A simultaneous quick increase of the active mobile Internet usage was observed. For example, between 2007 and 2008, this phenomenon registered an increase of 16% in the US and 12% in the UK and Italy (Nielsen Mobile, 2008). Worldwide, the mobile Internet penetration grew from 7% of 2008 to 23% of 2012 and 29% of 2013 (Statista, 2014). According to the same study, the mobile Internet penetration is expected to overtake the fixed-broadband penetration in 2017 (54% vs 51%, respectively). In some countries, this is already happening: for example, in terms of usage, according to StatCounter GlobalStats (August 2014¹), the mobile has overtaken the fixed-broadband Internet usage in India (70.4 vs 28.2%), South Africa (55.7 vs 38.7%) and Saudi Arabia (51.2 vs 40.5%). Currently, the mobile usage represents 25% of the overall web usage, according to Smart Insights (2014) and KPCB (2014). This corresponds to an increase of 14% in comparison to the previous year. In particular, according to KPCB (2014), in Europe the mobile access is 16% of all web usage (+8% in comparison to the previous year), and in North America it represents 19% of all web usage (+11% in one year). StatCounter GlobalStats (2014) confirms these findings: the percentage of desktop Internet traffic was 63.6% in October 2014 (-32 percentage points, if compared to January 2011), whereas for mobile usage the percentage has grown rapidly from 4.3% registered on January 2011 to 29.8% in October 2014 (+25.5 percentage points). In this same month, tablets accounted for 6.53% of global Internet usage, whereas this percentage, just 12 months before, was 4.54%. Thus, an increase of 1.99 percentage points is observed.

Several factors contributed to this spreading process: for instance, the generally decreasing costs of mobile web connection or the improved quality of networks. But this trend is expected to be further encouraged by the wider distribution of mobile devices characterizing most countries. This process of wide spread of mobile in web usage, according to recently observed data, will probably continue in the near future. Because of this, many researchers started thinking that web surveys needed to be adapted to these new devices. For instance, de Bruijne and Wijnant (2013, p. 483) claim that if the use of mobile devices is already considered a “serious new alternative [...] for web-based self-administered surveys”, probably, with

¹ StatCounter is a web analytics service that tracks over 3 million web sites worldwide. Every month, billions of page views of these web sites are analysed, recording characteristics of the web usage such as browser or use of mobile devices. For further information, see: <http://gs.statcounter.com/faq>.

more developed technologies for both smartphones and tablets, in the close future it will become “not only an alternative way to reach respondents, but perhaps even an indispensable one”.

Nowadays, even if some probabilistic-based online panel exist (e.g. the Knowledge panel in the USA, the LISS panel in the Netherlands, the ELIPSS panel in France, or the German Internet Panel), the large majority of web surveys are done by non probabilistic-based panels, also called opt-in or access panels. Because people volunteer to participate in these panels, we can expect that the spread of devices differs in these panels, if compared to the general population, being probably higher. However, little is known about the exact spread of different mobile devices (tablets and smartphones) for people registered in access panels across time and in different countries. Also, little is known about which combination of devices panellists of access panels have at their disposal: how many of them have only a PC, only a mobile device (and which one), or a combination of both a PC and one or several mobile devices?

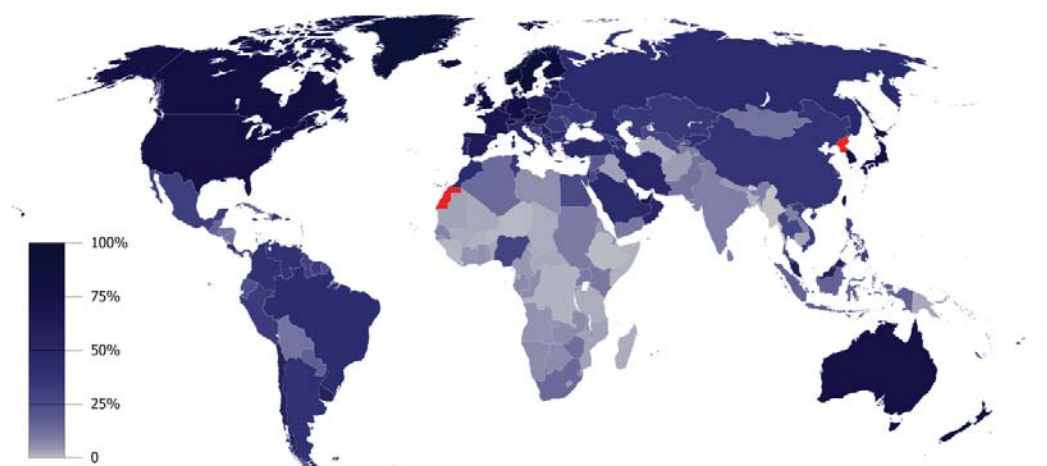
This is crucial information, since this kind of panels represents the majority of web surveys and since the participation of the panellists in these surveys is conditioned by the equipment they own. Indeed, access panels normally do not provide with equipment units that do not have it, such that they can still participate to the surveys, contrarily to what probability-based panels usually do. Therefore, to get an idea of the proportion of potential mobile respondents from access online panels, information is needed about the current spread of such devices within panellists of these panels.

In this chapter, we will use the Netquest online panel data to evaluate the current spread of devices and their combination in a set of countries not studied before: Spain, Portugal and five Latin American countries (Argentina, Brazil, Chile, Colombia and Mexico). First, section 2 will summarize what is already known about this topic, focusing on the status of the art of the current Internet coverage around the world and, more specifically, on the mobile web access penetration. Then, in section 3, we will provide new evidence about the spread of mobile devices in the Netquest panel, studying both the proportion of panellists that own or have access regularly to PC and mobile devices (smartphones and tablets) and the combinations of devices the panellists have. In section 4, we will study if there are significant differences between the groups of panellists that have only a PC rather than the ones that own at least one mobile device or no devices at all, and between the panellists that only own mobile devices and the others. Finally, section 5 will summarize and discuss the main results, together with the limits of this work and with some ideas to further develop this research.

2 Internet coverage and mobile web access

The Internet coverage is evolving very quickly. According to the latest data available (updated on December 31, 2013), the worldwide penetration of Internet, considering an estimated population of 7.18 billion, is 39.0% (source: Internet World Stats, 2014). The same percentage, updated on June 30, 2012, was 34.3%. This means that the coverage of the worldwide population has increased of 4.7 percentage points in just 1.5 years. If we consider a longer time range, the Internet penetration on the worldwide population raised of 676.3% from 2000 to 2014 (the same percentage, referred to the change between 2000 and 2012, was 566.4). Nevertheless, this general trend varies a lot by world regions. In fact, the percentage coverage of Internet ranges from 21.3% registered in Africa and 31.7% observed in Asia, up to 68.6% of the European countries and to 84.9% of North America. The growth rates from 2000 to 2014 are also very different, ranging from 177.8% observed in North America to 5,219.3% registered in Africa. If we take a more detailed look, even within the same region, the observed penetration rates of Internet varies a lot: for example, in Europe the minimum penetration observed is 41.8%, registered for Ukraine, and the highest one is 96.5%, for Iceland. In Figure 1, the Internet penetration rate by country is represented.

Figure 1: Internet penetration by countries (% of population)



Source: http://commons.wikimedia.org/wiki/File:Internet_Penetration.png; updated on Jan. 2012 (Red: no statistics available).

Nevertheless, if the Internet coverage increased so quickly in the last few years, what about the mobile access to the web? A lot of studies show that the mobile web penetration increased a lot in the last years too. According to an Eurobarometer study (Fuchs and Busse, 2009), 31% of the European population was covered by mobile Internet in 2007, which is 5 percentage points higher than in 2005. Nielsen Mobile (2008)

also highlights the growing importance of this phenomenon. In the first quarter of 2008, there were 254 million of mobile subscribers in the US; this generated \$1.7 billion in revenue, an amount that had quickly increased, if compared to the \$5 billion in total revenue observed in the entire 2007. In particular, the US number of subscribers for mobile Internet grew of 28% in only one year, between the first quarters of 2007 and 2008. In the US still, in May 2010 the estimated percentage of adults that used to access to the web on a mobile device was about 40% (+8 percentage points in comparison to 32% observed in 2009; source: telephone survey realized by Pew Research Center, 2010). Moreover, even if young adults (18-29 years) showed the highest levels of mobile devices usage (among all age groups), also among the 30-49 years old the utilization of these devices was growing fast. If compared with other kinds of access, 49% of cell phone owners usually accessed to the web by their mobile device (40% of all adults, +8 percentage points in comparison to April 2009).

Coming to closer times, in December 2011, 35% of EU citizens owning a personal mobile phone had access to the Internet through their mobile phones (Eurobarometer, 2012). The phenomenon is mostly widespread in Sweden (63%), the UK (58%) and Slovenia (57%), whereas it is still less common in Bulgaria (13%), Portugal (16%), Italy (17%) and Romania (18%). According to another research developed by Statistics Netherlands (2012), the mobile access rates continued to grow very quickly. In Netherlands, 96% of the 12-75 years old use Internet, and from 2007 to 2012 the percentage of these users that accessed the Internet by mobile devices has tripled: 60% of Internet users accessed the web by means of mobile devices in the three months before the survey. In comparison to the previous year, a growth of 10 percentage points was observed. The growth is particularly high if we consider the young people: in 2007, 21% of the 12-25 years old regularly used mobile devices to go online, whereas in 2012, the same percentage increased to 86% (27% of the 12-75 years old people accessed to Internet by mobile phone, 11% via tablets). Focusing on the different devices, in 2012, the preferred ones were mobile phones (small and handy, used by 47% of mobile Internet users, 66% of them daily), but also tablets (19%) were regularly used (Statistics Netherlands, 2012). Nevertheless, there is still a not negligible percentage of Internet users (e.g. 40%, in the Netherlands) that does not use mobile devices to access to the web. This is mainly because they do not need to connect if they are outside home or working places or due to the connection's costs. About this last aspect, in a Eurobarometer study (2012), it was highlighted that about 43% of mobile Internet users limit their mobile Internet use due to concerns about charges. The most concerned about mobile Internet charges are Belgian (62%),

Irish (60%) and Greek (60%), whereas lower percentages are registered in the Netherlands (29%), Sweden (29%) or Luxembourg (28%).

Between January 2012 and September 2013, the worldwide access to the web by mobile web browser increased from 8.49% to 17.81% (StatCounter GlobalStats, 2013). de Bruijne and Wijnant (2013) study the kind of connection to Internet, analysing the CentERPanel data collected in the Netherlands: 28.7% of panel members (14 years and older) involved accessed to the web by smartphones, 19.1% by tablets. This is consistent with KPCB (2014) statement that 30% of all mobile users are smartphone users. More recently, StatCounter GlobalStats (2014) observed that the worldwide use of mobile devices to surf the Internet has increased by 67%, from September 2013 to the same month of 2014. If we consider the global mobile data traffic, the growth registered in 2013 is of 81% (Cisco VNI Mobile, 2014). In the same study, the global mobile data traffic is forecasted to grow nearly 11-fold between 2013 and 2018. This corresponds to a compound annual growth rate of 61%.

If these are the general figures, the situation changes a lot considering different countries or regions. Analysing the mobile web penetration in earlier years, Fuchs and Busse (2009) noticed that the rates were very different country by country: in 2007 in Europe, rates were varying from 18% in Romania and Bulgaria to 42% in Estonia, Sweden, Latvia and Slovenia, up to 49% in Luxembourg. The same authors noticed that no clear pattern was observed for mobile web access rate: the coverage was mostly driven by various activities of network service providers in different markets. Just to provide some examples: from 2005 to 2007, the increase was of 17 percentage points in Ireland, of 15 in Lithuania, of 3 in Belgium; Hungary was stable (+ 0%); on the other side negative values were observed (probably at least in part due to margins of error) in Italy (-1 percentage point), Malta and Germany (-2) and in Cyprus (-4). If we consider more recent data, according to an Eurobarometer (2012) study (referred to December 2011) in comparison to the first part of the year (March-April 2011), a marginal increase of the proportion of respondents who own mobile phone subscription allowing them to access the Internet was observed (+1%). But, again, this general figure varies a lot if one compares different countries: for the UK, Slovenia, Finland and Malta, for example, a growth of 6% was observed, similar to the level registered in Luxembourg (+5%); on the other hand, a fall in mobile Internet access was observed in Portugal (-12%) and in the Czech Republic (-7%).

Table 1 helps in focusing the analysis of the current web usage (and of its spread in the last few years), considering specifically the countries that will be studied in this chapter: Argentina, Brazil, Chile, Colombia,

Mexico, Portugal and Spain. In particular, the table shows the percentages of desktop and mobile web usage² comparing October 2014 with October 2012 (data source: StatCounter Global Stats, 2014).

Table 1: Desktop and mobile web usage by country (2012 vs 2014)

	October 2012		October 2014		Mobile change (% points; 2014 vs 2012)
	Desktop	Mobile	Desktop	Mobile	
Argentina	95.55	4.45	79.94	20.06	+15.61
Brazil	94.49	5.51	74.73	25.27	+19.76
Chile	94.61	5.39	60.88	39.12	+33.73
Colombia	96.84	3.16	79.32	20.68	+17.52
Mexico	91.68	8.32	63.97	36.03	+27.71
Portugal	96.21	3.79	78.27	21.73	+17.94
Spain	90.11	9.89	56.64	43.36	+33.47

The Internet traffic by device has changed a lot in the last 2 years only. If in October 2012, the desktop accesses covered more than 90% of web traffic in the seven considered countries (with a peak of more than 96% in Colombia and Portugal), after 24 months the same percentage dropped of more than 15 percentage points. But these general figures are only the reflection of different level of changes observed in different countries. The drop is indeed mostly relevant in Chile (from 94.61 to 60.88%), in Mexico (from 91.68 to 63.97%) and in Spain (from 90.10 to 56.64%), whereas it is observed at a lower level for example in Argentina (from 95.55 to 79.94%), in Portugal (from 96.21 to 78.27%) or Colombia (from 96.84 to 79.32%).

As a consequence of this, the biggest increase in terms of mobile usage of the web are observed for Chile (from 5.39 to 39.12%, corresponding to +33.73 percentage points), Spain (from 9.89 to 43.36%; +33.47 p.p.), and Mexico (from 8.32 to 36.03%; +27.71 p.p.). In 2014, the spread of mobile traffic shows lower levels (between 20 and 26%) for Brazil (25.27%; +19,76 p.p.) Portugal (21.73%; +17,94 p.p.), Colombia (20.68%; +17.52 p.p.) and Argentina (20.06%; +15.61 p.p.).

To sum up, a lot of research has been made showing that overall, a fast increase is observed in most countries in Internet coverage and mobile access of the web. Nevertheless, the necessity of further research is emphasized by the following factors: first, the noticeable differences in mobile Internet coverage/usage penetration rate and in its patterns over time observed by countries (e.g., Fuchs and Busse, 2009, Eurobarometer, 2012, StatCounter GlobalStats, 2014); second, the potential different purposes and factors that push people to the mobile usage³; third, most of previous results refer to the general population, but we can expect differences for mobile spread between the general population and the participants of access online

2 StatCounter tracks the tablets as a separate category. Nevertheless, in table 1 data of “Mobile devices” also include tablets: we merge the two categories for the sake of clarity.

3 For example, in Japan the mobile web is very spread, because it is mainly used for watching television and for the Internet access, whereas mobile web access is less important in other countries, where there are already landline infrastructures for both TV and Internet (Okazaki, 2007).

panels. Some agencies or services, such as StatCounter, already provide detailed and updated data considering the web usage (see table 1), but this information does not really fit to the purposes of our research for two main reasons. First, StatCounter data are focused on the web-traffic; thus, for instance, the same mobile-user can be counted several times, accessing to several web pages with the same device. Second, our study is mainly focused on panellists and their coverage by mobile access, not on the general population. Online panels need to know specifically what the spread of mobile devices within panel members is and who the persons susceptible to answer (or not answer) to the surveys through mobile devices are. We assume that the spread will be even larger in this specific population of web panellists, but how much larger? And are there groups of panellists with different levels of mobile coverage? Moreover, the urgency to develop a more detailed research rises by the fact that mobile devices are not only replacing more traditional devices like PCs (fixed-PCs or laptops), but they are also complementing them in many cases, such that more and more individuals own not only one device but a combination of devices. For example, it was highlighted that “mobile Internet is used as a complimentary mean for accessing the web; respondents who have mobile Internet have Internet in their homes as well” (Eurobarometer, 2012, p. 9). Thus, it becomes relevant also to understand which combinations of devices the panellists have regular access to. Very little is known about this topic, in particular in some geographical areas, like Latin America. That is why, in the following of this chapter, we will focus on the spread of mobile devices for participants of an access online panel in seven countries that have not been studied much before, from this perspective.

3 New evidence from the Netquest panel

Netquest (www.netquest.com) is an online fieldwork company founded in 2001 that started its first online panel in 2006, in Spain. Currently, it is also present in Portugal and Latin America, with more than 450,000 panellists truly active and 4 millions of completed surveys every year. What differentiates Netquest from other online access panels is that it is the only one in the region accredited with the ISO 26362 quality standard. Netquest recruits people corresponding to the profile it needs to participate in the panel. The potential respondents are selected from different databases of users of many websites that agreed to receive emails. Once they have joined the panel, for each completed survey, panellists get points that they can exchange for gifts. While most of the surveys sent by Netquest were prepared for computers, the company noticed an increasing demand from their panellists to use mobile devices to answer the surveys. In order to get more information on this phenomenon, Netquest provided us with the necessary data to study more deeply the spread of mobile participation within its panellists to determine which strategy to adopt for the next years. The results of the analyses are presented in the next subsections (sec. 3.1 to 3.3). By using these data, we get new evidences about the spread of mobile access in Central and Latin America, Portugal and Spain, and for a very large number of panellists.

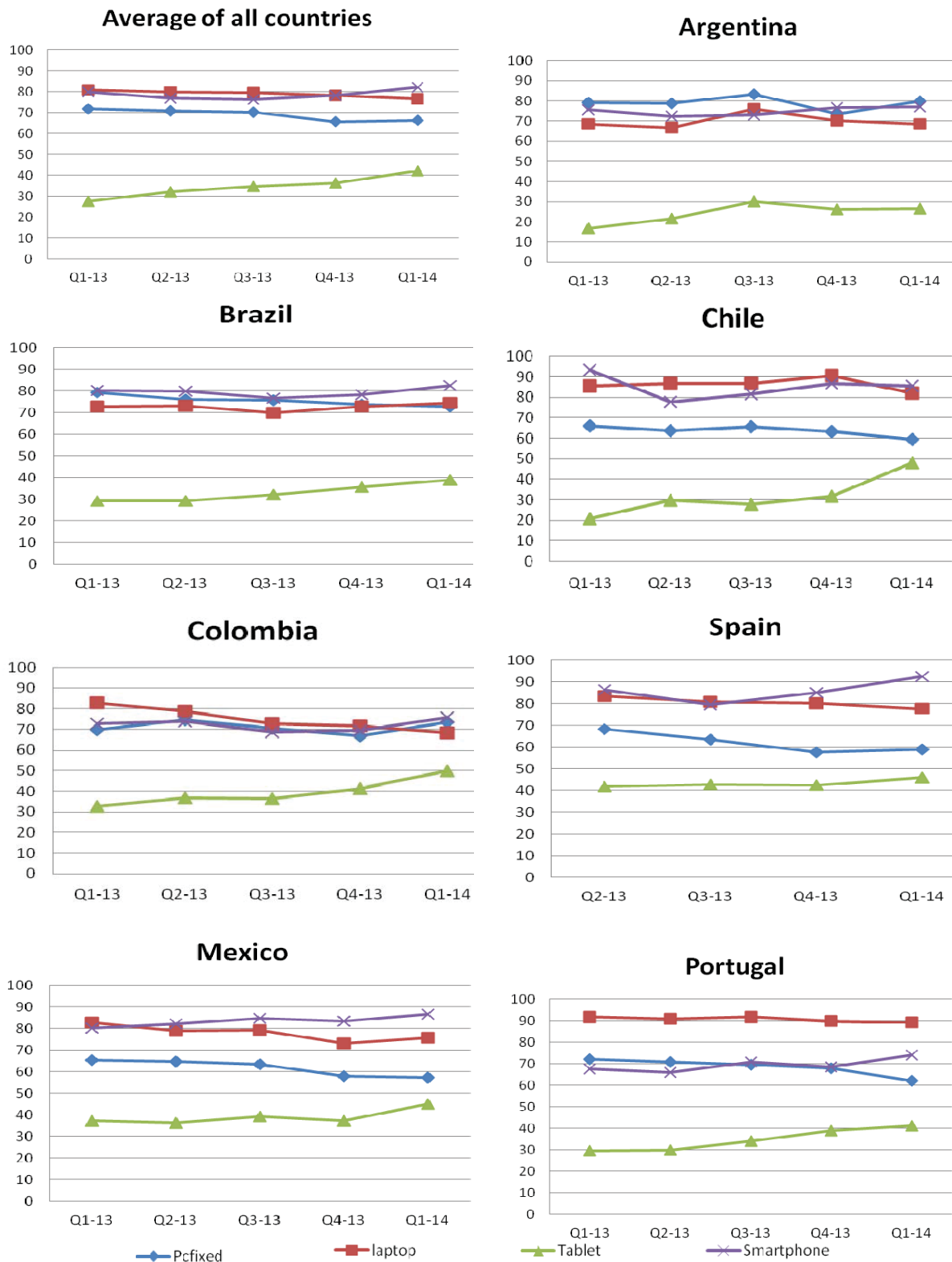
3.1 Owning different devices

Netquest has a system of continuous profiling of its panellists by means of different modules. Each module deals with a different topic. When respondents are filtered out of a survey, they get one of these profiling modules. Using this system, Netquest accumulates information about as many panellists as possible in order to be able to target specific populations and/or to model different behaviours or attitudes. The order in which respondents get the modules depends on the level of priority Netquest attributes to the corresponding topic. Starting from the end of 2012, Netquest introduced two modules: one about the equipment of the respondents, in which they are asked, among other things, if they have a desktop PC, a laptop, and/or a tablet; one about new technologies, in which one of the questions asks if they own a Smartphone.

Figure 2 shows the percentages over time of panellists that own the different devices by country. The data are aggregated by quarter. The first data correspond to the first quarter of 2013 (except for Spain, where the modules started later). Even if some of the information was available for the end of 2012, it is not shown in the graphs, because it was incomplete. It should be clear that the information is based on dif-

ferent panellists at the different points in time. Thus, the number of respondents to these modules varies from month to month and country by country (cf. Appendix 1). Nevertheless, overall these results represent a huge amount of panellists for which this information is known: more than 190,000 for the first module, and more than 250,000 for the second one.

Figure 2: Percentages of panellists that own different devices



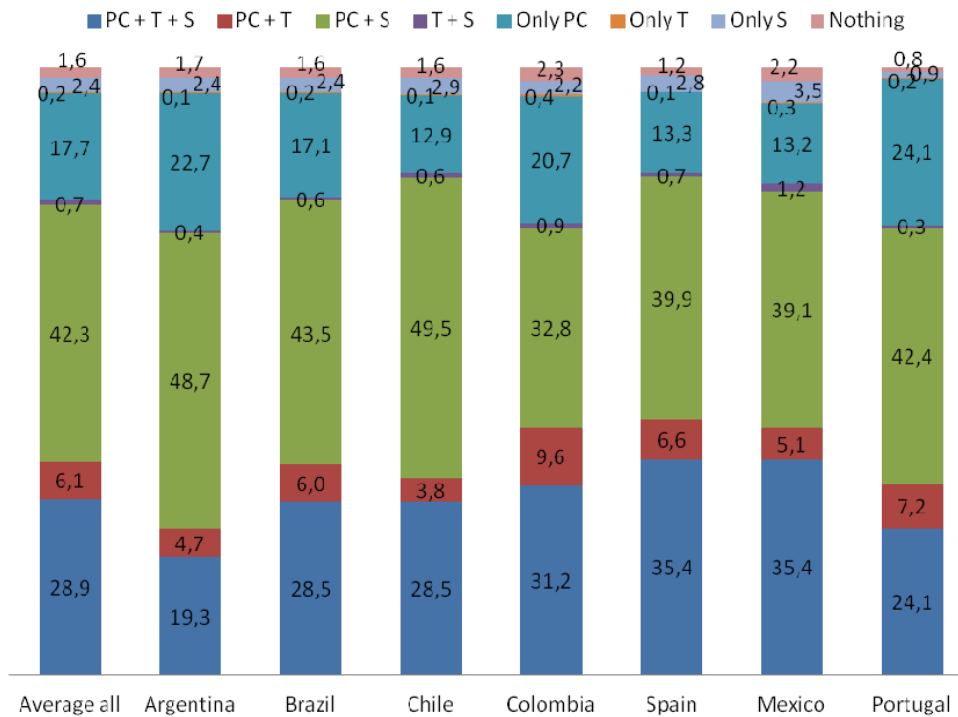
Note: Q1-13 means the first quarter year of 2013, Q2-13 means the second quarter year of 2013, etc.

The first chart of Figure 2 shows the average of all countries. It highlights that the proportion of panellists who own a smartphone in the first quarter of 2013 (79.9%) is as high as the one of those who have a laptop (80.7%). Both are about 10 percentage points higher than the proportion of panellists that own a fixed-PC (71.9%). Moreover, the proportion of smartphones owners seems to have slowly overtaken the percentage of laptop owners (see the data for the last quarter in the same chart: 82.0% for smartphones vs 76.6% for laptops). Generally, the proportion of panellists with a tablet is much lower (around 30-40%) but it is also increasing over time, even very quickly in some countries (e.g. in Chile, where the percentage is more than doubled in just one year). On the contrary, the proportion of panellists owning a fixed-PC tends to reduce: at the average level, it loses about 5 percentage points in one year, and this trend is confirmed in all the single countries. Even if there are differences across countries in the observed percentages of smartphones and tablets owners, clearly a large majority of panellists owns mobile devices and we can reasonably expect that this phenomenon will still further spread in the future (at least on the tablets side). On the other hand, Figure 2 already suggests that probably less and less panellists will own a computer (at least a fixed-one); these findings seem to confirm the forecasts of some studies, that are expecting the mobile web penetration to overtake the fixed penetration in the next few years (Statista, 2014), as seen in section 1.

3.2 Combination of devices

Figure 2 only provides information about owning different devices, without allowing separating if respondents own only one device, or a combination of two or more devices. To get this more detailed information, we need to cross the data from the two modules previously mentioned (sect. 3.1). In doing so, we are reducing the number of observations at each point in time quite a lot. For this reason, instead of looking at each quarter year, we have aggregated the data of the different quarters, starting with the second quarter year of 2013 because there is not enough data before. Figure 3 presents the percentages of panellists that answered both modules and have only one device, or a combination of two or three of them (in the figure, the two kinds of PC, fixed and laptop, are combined for the sake of clarity).

Figure 3: Percentages of panellists that own different combinations of devices



Note: T = tablet; S = smartphone; PC = fixed PCs + laptops

Again, Figure 3 shows that, even if there are some variations in the size of the proportions across countries, overall, the same main trends are observed. In all countries, the largest percentage corresponds to the combination of a computer and a smartphone (42.3%, at the average level). The following larger category is the combination of the three devices (computer + tablet + smartphone, 28.9% at the average level). At the average level, only 20.3% of panellists own only one kind of devices. Therefore, the majority of potential respondents can really choose to answer to surveys through one or another device. However, there is still a non-negligible part of panellists who have only a computer (from 12.9% in Chile to 24.1% in Portugal; 17.7% at the average level). Almost no panellists have only a tablet (0.2%) and very few of them have only a smartphone (2.4% on average, with a maximum level observed for Mexico: 3.5%) or no devices, but for instance go to Cybercafé or do it from work (1.6%; this percentage rises to 2.2% for Mexico and to 2.3% for Colombia).

Looking to the evolution over time of owning these devices, Figure 4 shows the differences (in percentage points) between the proportions of panellists with one, two or three devices, comparing the last point in time available (Q1 of 2014) and the first one (Q2 of 2013).

Figure 4: Differences between Q1 of 2014 and Q2 of 2013 by combination of devices (percentage points)

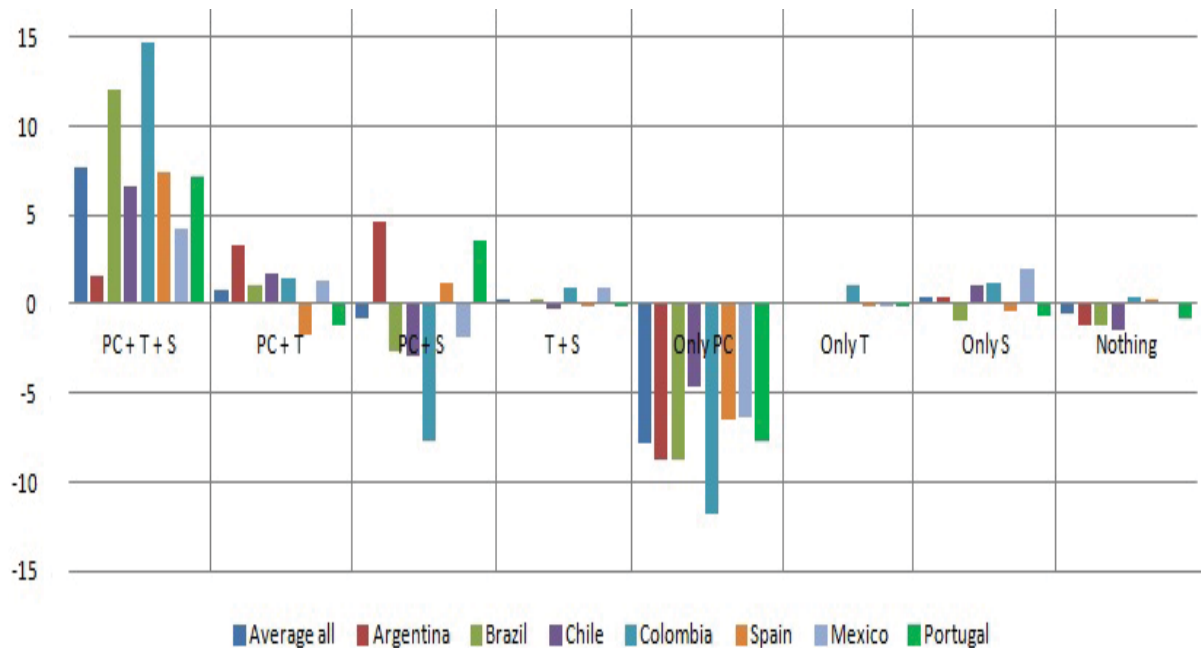


Figure 4 shows that the ownership of different devices has evolved quite a lot in about one year: for example, the proportion of panellists with three devices increased considerably (7.7 percentage points at the average level, with a peak of 14.7 percentage points for Colombia); on the other hand the proportion of PC only owners mainly decreased in all countries (7.8 percentage point, with a maximum of 11.9 percentage points lost for Colombia).

3.3 Access to different devices

So far, we focused the analysis on the fact that panellists own or not different devices. However, we should notice that panellists can also have access to some devices even if they do not own them: for instance, they can have regular access to a computer at their work place or at a library. In order to take this important aspect into account, we studied data from a survey completed by around 1,000 Netquest respondents within each country (quotas were set by age and gender to obtain, in each country, a sample representative of the complete panel). Respondents were asked if they own different devices, and, in case they answered “no”, they were asked if they have a regular access to these devices. In Table 2 the additional percentages of respondents that have regular access to the devices, even if they do not own them, are shown.

Table 2: Additional percentages of respondents that have regular access to the devices

	Fixed PC	Laptop	Tablet	Smartphones
Argentina	11.8	11.6	17.6	8.8
Brazil	15.2	10.8	12.6	4.9
Chile	19.7	6.8	19.6	4.3
Colombia	11.7	12.9	22.2	9.2
Spain	10.5	4.9	12.0	2.1
Mexico	13.3	9.2	19.3	5.1
Portugal	17.9	6.2	10.8	5.6
Average All	14.3	8.9	16.3	5.7

Note: The average is unweighted

Table 2 shows that there is a percentage of additional respondents, between 10.5% (observed in Spain) and 19.7% (in Chile), who have regular access to a fixed-PC, even if they do not own one; the unweighted average over countries is 14.3%. Considering the laptop, 8.9% of respondents (unweighted general average) have access to one, even if not owning it: the lowest percentage is observed for Spain (4.9%), and the highest one for Colombia (12.9%). The highest percentage of access to a device without owning it is registered for tablet (16.3%, general unweighted average; ranging from 10.8% in Portugal to 22.2% in Colombia); the additional usage for smartphones is reduced to only 5.7% (from 2.1% for Spain to 9.2% for Colombia).

From these results, we can presume that at least part of the considered panellists could be susceptible to answer surveys using these devices that they do not own but regularly have access to. However, it can also happen that they have access to these devices in places or times which will not allow or encourage them to participate to surveys. Therefore, it is difficult to estimate the real exact spread of the availability of different devices among panellists. This would need to be further studied.

In any case, we can conclude that overall, by not allowing respondents to answer the surveys through mobile devices, one would really exclude very few panellists for coverage issue, since very few do not have a computer (fixed or laptop), and even less do not have at least a regular access to a computer. Nevertheless, the panellists may decide to take part or not to a survey depending on the possibility to answer by means of different devices (including tablet and smartphones) and according to their preferences for these devices, since most panellists have the choice between at least two devices (and about 25-35% of them even between three devices). Further research is needed in this direction. Besides, even if it is a small group that would be excluded, this group could be very different from the rest of panellists; thus the impact on the representativeness of the panel may become problematic. Therefore, in the next section we compare the characteristics of panellists who own different devices.

4 Differences across groups: logistic regression analysis

In this section, by means of two logistic regressions, we aim at understanding to what extent there are differences in the characteristics of groups of panellists that differ in terms of ownership of devices. In particular, we focus on the following main available variables: gender (dummy variable: 1 = men), age (in categories), education (from lower to higher diploma; categories vary for different countries) and number of household members (numeric). In order to see which variables really affect the fact to own different devices, we firstly study the effect of the explanatory variables mentioned before on the fact that respondents own only a PC rather than at least one mobile device or no device at all. Table 3 presents the coefficients of this first logit.

Table 3: Logit of respondents that own only a PC versus the others

Own only PC	Argentina	Brazil	Chile	Colombia	Spain	Mexico	Portugal
Men	-.24	-.12	-.27	-.31*	-.64**	-.51**	-.43**
Age	.35**	.32**	.56**	.26**	.44**	.33**	.42**
Education	-.35**	-.50**	-.33**	-.50**	-.41**	-.19**	-.41**
No. household	.07	.13**	-.05	.05	-.20*	.08	-.01
Constant	-.94	-.69	-1.75**	.18	-1.08	-.99	-.73
PseudoR2	.0499	.0527	.0765	.0459	.0940	.0592	.0602
No. obs.	N=1000	N=1011	N=1000	N=1001	N=1002	N=1005	N=1000

Note: ** $p < .05$; * $p < .10$; No. household = number of persons in the household

According to the results shown in Table 3, in all countries there is a significant effect of age (higher probability to have only a PC for older respondents) and of education (lower probability to have only a PC for higher educated respondents). Gender has a significant effect in Colombia, Spain, Mexico and Portugal, but not in Argentina, Brazil and Chile. Generally, whether it is significant or not, the gender's effect is negative, meaning that men are less likely to own only a PC. The number of persons in the household has a significant effect only in two countries: Brazil (positive effect) and Spain (negative effect). Thus, overall, panellists that own only a PC differ from panellists with at least one kind of mobile device or no device at all in terms of age and education, and, in the majority of the countries, also in terms of gender.

Second, we study the respondents that only own mobile devices (smartphone, tablet, or a combination of both) versus the others. Because the proportions of respondents that only own mobile devices are very small in each country, a classic logistic regression may lead to biased estimates. Instead, we use the RELOGIT command in Stata (Tomz, King and Zeng, 1999). As defined by its authors, "RELOGIT is a suite of programs for estimating and interpreting logit results when the sample is unbalanced (one outcome

is rarer than the other) [...] RELOGIT estimates the same logit model as the -logit- command, but with an estimator that gives lower mean square error in the presence of rare events data for coefficients.” The program implements the procedures proposed by King and Zeng (1999a, 1999b). In Table 4 the results of the analysis are shown.

Table 4: ReLogit of respondents that own only mobile devices versus the others

Own only mobile	Argentina	Brazil	Chile	Colombia	Spain	Mexico	Portugal
Men	.06	-.50	.31	-1.44	-.32	-.67	-.52
Age	-.14	-.15	-.17	-.17	-.05	-.34	.01
Education	-1.34**	-.39	-.50**	-.32	-.64*	-.38**	-.61*
No. household	.25**	-.11	-.46*	.06	-.29	.06	.26**
Constant	-.71	-1.25	.10	-2.55	-.44	.06	-2.26
No. Obs.	N=1000	N=1011	N=1000	N=1001	N=1002	N=1005	N=1000

Note: ** $p < .05$; * $p \leq .10$; No. household = number of persons in the household

Table 4 shows that age and gender do not have any significant effect across all countries analysed. On the contrary education has a significant negative effect in Argentina, Chile and Mexico ($p < .05$) and on the edge in Spain and Portugal ($p = .10$). This means that in most countries, more educated respondents are less likely to have only mobile devices. Thus, allowing panellists to answer through mobile devices and adapting surveys to facilitate the completion on mobile devices may favour the participation of less educated people, who have a higher probability to own only mobile devices. Finally, the number of persons in the household has a significant positive effect in Argentina and Portugal, and a significant negative effect in Chile. On the one hand, the positive effect may be linked to the fact that the more people there are in a household, the higher the need for communication and the more devices are needed if the different members want to be able to connect at the same time, or if they want to have more independence in their communication. On the other hand, the cost per person of having a PC and fixed Internet connection is lower in a larger household. Also, if the household is larger, it is more probable that at least one of its members needs to have a PC (e.g. to work or study). Thus, the larger the household, the lower the probability of having only mobile devices.

5 Conclusions

The spread of mobile devices increased very quickly in the last couple of years and we can expect that this trend will continue. Therefore, researchers and online panels started to pay interest both to the new opportunities and new challenges that mobile devices could offer them. Previous research started to study the spread of the phenomenon mainly focusing on web coverage, on the mobile penetration of a general population or on the analysis of mobile web usage. The growing interest generated by the mobile access and usage of the web is confirmed by some experiments that were implemented about how to adapt questionnaires to these new devices, mainly smartphones and tablets. However, some preliminary results are based on only small samples of panellists. Moreover, some countries were not considered in previous research, even if the results can also strongly vary depending on the territorial context. Besides, these phenomena are developing and spreading so quickly that results from two or three years ago may be already out of date. On the other hand, there is a real demand for more information about these topics from web panels, which have to face the current lack of knowledge and do not know exactly what the best strategies are for the future. That is why, in this chapter, we tried to provide some new evidence about the potential for the use of mobile web in surveys for online commercial panels like Netquest, taking into account different countries not deeply studied before: Spain, Portugal, and some Latin American countries.

Firstly, we have studied the proportions of panellists who own different devices through time and we have seen that, even if the results differ across countries, overall, a very large proportion of panellists own mobile devices, in particular smartphones. This proportion increased quickly in less than one and a half year, whereas the proportion of fixed-PC owners tended to decrease. Besides, there is also a non-negligible proportion of panellists that have access regularly to the devices, even if they do not own them. Therefore, a really large proportion of the panellists can be considered as potential mobile web respondents. However, our results also show that a majority of panellists own not only one but a combination of several kinds of devices, PC and mobile. Thus, they really can chose through which device to answer. This means that the preferences for answering surveys using different devices need to be studied to get a more precise idea of the need for mobile surveys. Our results only show that there is a large potential. This potential is also linked to the characteristics of the panellists who own different devices. Comparing different groups of panellists based on their access to mobile devices, we found significant differences in terms of the main background variables (age and education) between respondents who own only a PC versus the others. We also found

significant differences between the respondents who own only mobile devices versus the others in terms of education and in some countries household size. This all suggests that, even if mobile web respondents may still represent a relatively small group, it is crucial for the representativeness to include and involve them in a survey. Besides, the evolution over time suggests that this group will keep growing very quickly.

Further interesting questions are: how is it possible to implement the adaptation of a survey to a mobile mode in a cost-effective way? And how is it possible to reach this objective allowing, at the same time, the comparability of results obtained across different devices? Even if the interest for these themes exists already, and even if many studies have been carried on, these are still quite recent and unexplored topics of research, and much more needs to be done about them. Moreover, technology is evolving so quickly, that also research results have to be updated more and more frequently to obtain and maintain an up-to-date view of the reality. Therefore, we need longer time series to track the different phenomena in the future. Furthermore, some of the data we used in this work were not specifically planned to be used for it when they were collected. This means that we had to adapt the analyses to the information that was available. Nevertheless, in the future data could be collected in a more systematic way, and data collection can be planned in advance, such that more precise and/or more complete information could be available. Previous results, including ours, are also focused on a limited number of countries. Research should be extended to more and more contexts, since we have noticed that the situation clearly varies across countries.

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Appendices

Appendix 1: Access to mobile devices: number of observations in each country (by quarter)

		Q1-13	Q2-13	Q3-13	Q4-13	Q1-14
Argentina	PC,T	3,513	1,985	328	8,277	3,830
	S	417	1,472	13,220	11,245	2,663
Brazil	PC,T	4,994	8,117	4,149	12,253	15,962
	S	63	75	30,265	1,833	1,930
Chile	PC,T	1,567	1,811	765	7,641	1,578
	S	13	263	2,737	2,903	263
Colombia	PC,T	2,797	3,080	799	7,862	2,935
	S	238	461	5,848	2,804	773
Spain	PC,T	NA	34,493	4,323	63	5,866
	S	783	2,654	218	248	3,817
Mexico	PC,T	16,937	7,133	4,015	1,439	5,463
	S	674	666	7,117	4,535	605
Portugal	PC,T	919	4,596	1,512	266	187
	S	827	136	1,394	3,658	1,281

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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