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ESS Mixed Mode Experiment Results in Estonia (CAWI and CAPI Mode Sequential Design)

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1. Introduction

This report gives the first overview of the main result of the European Social Survey (ESS) mixed mode experiment in Estonia conducted in 2012. The mixed mode experiment in Estonia was carried out as a part of the European Social Survey (ESS) Mixed Mode Methodology Programme. The aim of the experiment was to investigate the feasibility of using a mixed mode data collection process compared to traditional face-to-face data collection methodology. The mixed mode data collection was organised as CAWI (online) and CAPI mode sequential design. The experiment was jointly funded by a contribution from City University London (from its ESS-DACE grant) and Ministry of Science and Education in Estonia (Rahvusvahelistumise programm “Estonia in ESS”). The Estonian experiment report compares the mixed mode survey results with the main ESS results in terms of response quality, response rates, and response distributions.

The special thanks of the ESS Estonia team go to Ana Villar from London City University for her cooperation and professional help throughout the preparation and implementation of the experiment.

2. General organisation of ESS mixed mode experiment in Estonia: combination of an online and face-to-face survey

Estonia as a country boasts an EU average in Internet access and usage in Europe (Figure 1) and is therefore well suited for Internet-related behaviour analysis. The share of those Estonians who have never used the Internet (19%) is average among other European countries (Figure 2). The most active Internet users are 20–40-year-olds, who usually display the lowest response rates in traditional sociological surveys.

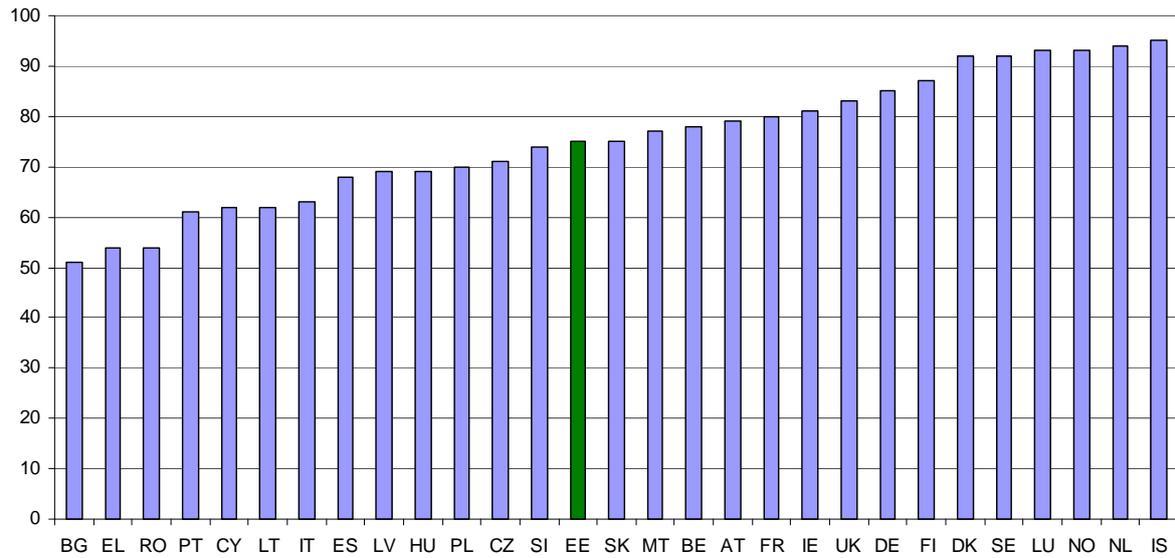


Figure 1. Internet access in households (%) in 2012 (Data source: Seybert, 2012)

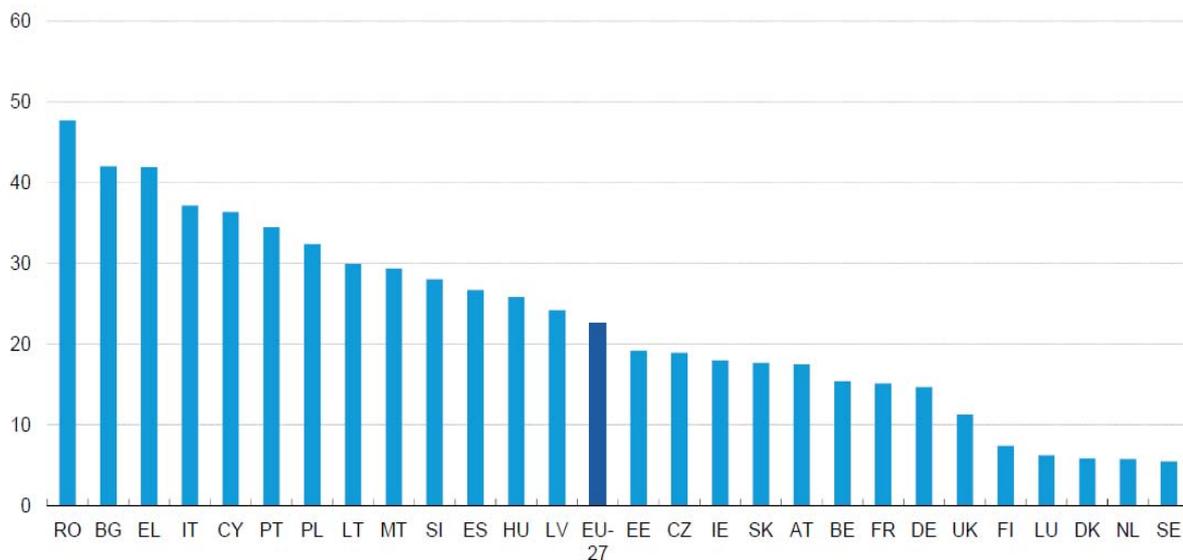


Figure 2. Individuals who have never used the Internet, 2012 (% of individuals) (Source: Seybert, 2012)

There are equal share of Internet users among men and women in Estonia (Sikkut, 2012). The older the people, the less they use the Internet – 30% of 65-74-year-olds use the Internet (compared to the 76% among the entire population). People in the cities use more Internet than those living in the countryside (77 versus 70%).

Young and mobile respondents are the main source of non-contacts and refusals in sociological surveys. The younger and more mobile respondents were expected to be more likely to participate when invited to complete a online survey, thus resulting in an increase of

the overall response rate. Online surveys were also expected to be a more attractive survey mode, generally encouraging respondents to participate and make fieldwork cheaper, since there are no interviewer salaries to pay (they form a major part of ESS fieldwork budget).

Estonia carried out the ESS mixed mode experiment simultaneously with the ESS main survey in autumn and winter 2012. All stages of the survey were prepared and conducted concurrently by the same fieldwork agency under the supervision of the ESS team in Estonia. The survey was carried out in Estonian and Russian languages, as is usually the case with ESS in Estonia.

3. Time and management

Figure 3 gives a short overview of the preparation and implementation stages of the mixed mode experiment.

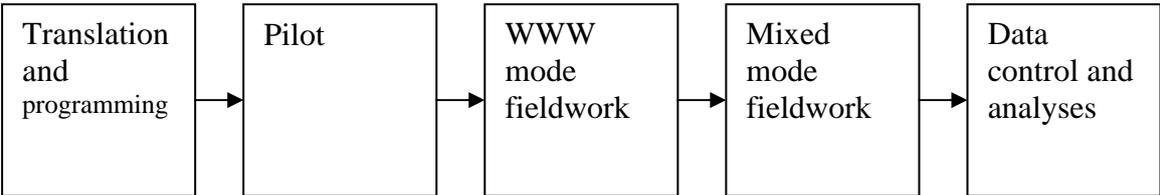


Figure 3. The main stages of the ESS mixed mode experiment in Estonia

A public procurement to find the suitable fieldwork agency was organised in Estonia before the fieldwork started. The procurement required a joint tender for the main ESS as well in order to ensure that the fieldwork for both surveys is carried out by the same agency.

After the end of fieldwork, the fieldwork agency gave feedback stating that it was difficult for them to estimate the total workload related to the mixed mode experiment in the stage of submitting their tender. Mostly, they underestimated the costs related to programming the mixed mode questionnaire. In the future, they would like to receive clearer instructions about the requirements of a mixed mode survey in the very first stages of the survey.

3.1. Translation and programming

Estonia conducted all the activities related to the ESS and the ESS mixed mode survey simultaneously. In the first stage, a main ESS questionnaire prepared in British English was translated into Russian and Estonian – two traditional ESS languages in Estonia – following all the translation requirements of ESS. The mixed mode experiment used a modified version of the ESS questionnaire for the online mode. There were three main reasons why the main ESS questionnaire needed adapting for an online questionnaire:

1. Change of written work orders (*please write* in the online survey, instead of *please tell me, please use card 45* etc.).
2. Transformation of the show card information from a face-to-face survey mode to the online survey mode.
3. A block of interview questions needed a new version compared to CAPI.

Managing *don't know* answers and cases when a respondent tried to skip the question without an answer posed special technical challenges.

Instruction for online version:

Response options that are volunteered in a face-to-face interview should only be offered once a respondent has tried to skip a question by clicking Next without selecting an answer. These answers are: don't know, prefer not to answer, depends on the circumstances in questions E31, E36, and E41. There should be an additional blank line (see questionnaire, for example questions A1 and A2) separating these options from the previous options in a vertical scale, and they should appear underneath horizontal scales (see questionnaire, for example questions A3 and A4). When this happens, a warning message in red should appear. If the respondent clicks Next after seeing the warning message, allow the respondent to move on to the next question even if he/she has not selected any of the available response options. Above is the default message that should appear if a respondent clicks Next without selecting an answer. Some questions have additional warning messages.

We also learned that in gender sensitive languages, the wording of a questionnaire needs to be designed separately for male and female respondents. It must be ensured that the correct gender selection is made at the beginning of an online questionnaire.

Ca. 85% of the main ESS questionnaire needed additional treatment as a result of these amendments. It constituted a much greater translation and programming workload than initially planned.

The WEB and CAPI mode proved to be quite different modes in terms of programming. The Conformat platform from the Norstat agency was used to programme both the CAPI versions and the WEB mode in Estonia. Although different sections from CAPI could be used for the online survey, the questionnaire was essentially written from the very beginning after countless checks and comparisons. **Some similarities between the modes tended to create problems rather than benefit, as tiny important differences between the CAPI and WEB version were often overlooked.**

The WEB version of the survey was much more demanding in terms of visual design. Smartphones were not considered suitable because of the small screen size, but it proved difficult to even fit some cards (such as education) on computer screens because of their large size. The correct design of different scales was one of the important issues we tackled. We learned that all the important information must be presented in a font that is large enough. However, a large font size conflicted with the aim of fitting all the information on a screen in a balanced way. It was technically challenging to draw response boxes of equal sizes, despite the amount of text in them. This required additional programming.

Some technical difficulties were also faced concerning the solution of ensuring that if a person stopped filling in the questionnaire in the Internet and returned to it the next day, he/she could start from the question he/she had stopped at. It took us a long time to get this option to function correctly online. Household questions were also technically difficult in the online mode.

The questionnaire was embedded in a secure, password-protected Internet environment. However, for archiving the original online survey cannot be active for a period exceeding the data collection season. Therefore we were unable to preserve original functionality of a questionnaire for the data archive. The ESS Estonia team took visual snapshots of the online mode pages for the data archive.

A fieldwork agency decided to collect contact form information from interviewers both in the online mode and on paper. Interviewers were instructed to complete both the paper and the online report about all sample units. A number of different behaviour combinations during a mixed mode survey caused serious difficulties for programmers in finishing the online tool for contact forms. Additional information – easy to add on paper – proved to be a complicated managerial issue in the online programme.

We also learned that different simultaneous online information collection systems in interviewers' computers must be very clearly visualised and clarified for them. The experiment indicated that three parallel ESS-related programmes running in an interviewer's computer caused a lot of confusion, especially for interviewers who had less experience with computers. They made mistakes with choosing the wrong access number, replacing their own ID number with that of the respondent, choosing wrong online pages for access etc. The computer solution created by the fieldwork agency was not the most reasonable one and could have benefitted from a better solution. The agency used international software and faced difficulties when adding local language instructions to the software. Therefore, many interviewers worked with software in a language unfamiliar to them.

Despite many technical difficulties, the online software for contact forms was appreciated by the fieldwork agency itself. It helped them to monitor the work of interviewers online and gave them the opportunity to immediately see the mistakes made by an interviewer during fieldwork.

As a final remark about the questionnaire and programming, we noticed that although computer solutions are supposed to avoid human error, they are also the cause of new mistakes. For example sometimes interviewers selected the wrong items from the list by a technical mistake.

3.2 Pilot study

The mixed mode pilot study was carried out twice (instead of one pilot for the main ESS) and for seven different versions.

1. One pilot for CAPI in Estonian / one pilot for CAPI in Russian;

2. One pilot for a CAWI Estonian questionnaire / one pilot for a CAWI Russian questionnaire without computers;
3. One pilot for a CAWI Estonian questionnaire / one pilot for a CAWI Russian questionnaire for men / one pilot for an online Russian questionnaire for women over the Internet.

Despite the great workload, the pilot was a useful exercise. The only challenge was to keep track of all the changes: if a change was introduced to a version, it had to be introduced to all other modes and all other languages as well.

3.3 Online mode fieldwork stage

A sample for the survey was based on the Population Register data (random individual sample). An invitation letter (a contact letter) to participate in the survey was sent to all the respondents to their postal address on **18 September 2012**. **The invitation letter also included an individual password to access the online survey and a small reflector as an incentive.** The invitation letter resembled the main ESS invitation letter, with only one exception – with the request to answer the survey over the Internet. The sampled units received also brief information on how to find the online questionnaire and contact the survey agency. It offered the respondents the possibility to call the survey agency to arrange a face-to-face interview if they could not or did not wish to complete the online survey. The letter also included information to the respondent that he/she will not/is unable to fill in the survey online (no Internet connection or other reasons, or refuses to use the Internet), he/she will be recruited for a face-to-face interview and will be visited by an interviewer during the fieldwork period.

According to the information provided by the survey agency, they received surprisingly few calls related to online problems or complaints about technical difficulties. However, some people were confused by different web addresses and tried to fill in the questionnaire at the address www.europeansocialsurvey.org.

If the sample units did not finish the questionnaire or did not give any information after two weeks, they received a first reminder letter (copy of the invitation letter) on **1 October 2012**.

The reminder had a clear effect on response activity, which increased once again (Figure 3).

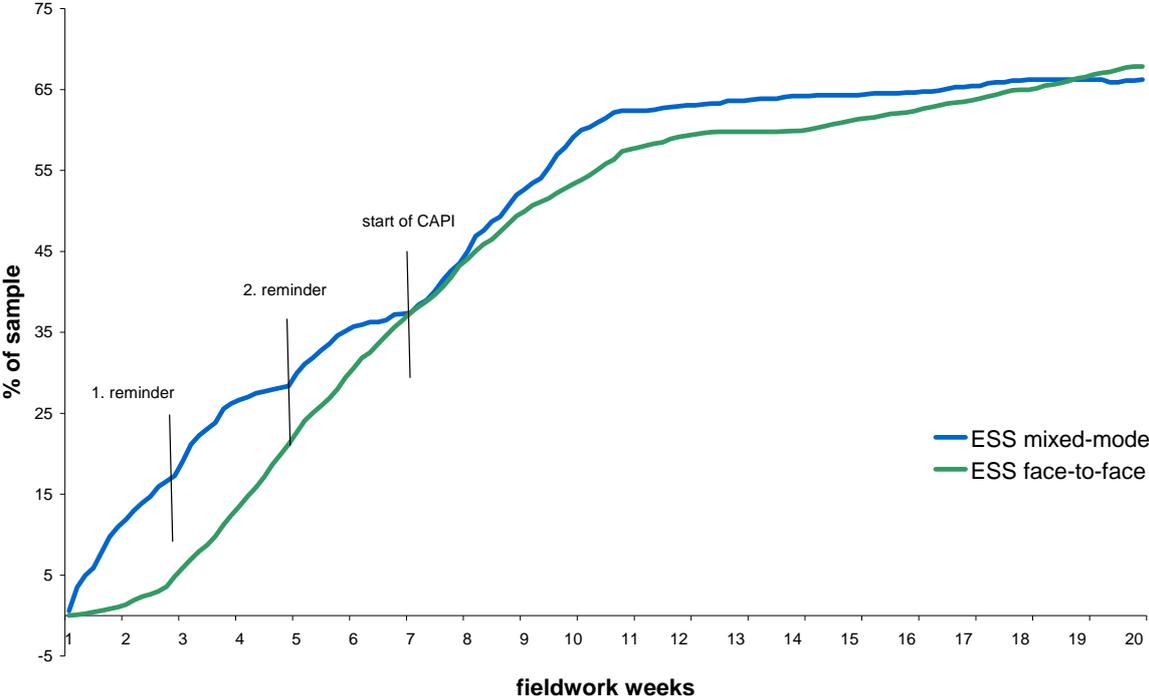


Figure 3. Cumulative number of mixed mode respondents

A second reminder letter was sent out after two weeks on **16 October 2012**. By that time, 241 respondents had completed the survey online, 30 had started, but had not finished yet and 27 persons had passed information about themselves to the fieldwork agency. Once again, the response activity demonstrated an increase after the second letter. On 22 October a final reminder letter was sent to the e-mail addresses of those 15 respondents who had started filling in the questionnaire online and had given their e-mail address, but had not managed to finish the survey.

3.4 Mixed mode fieldwork stage

On 22 October, the face-to-face stage of the mixed mode survey started. The survey units who had not responded were passed on to the face-to-face stage. This stage was conducted according to the CAPI procedures of the main ESS. However, the online survey environment remained open when the face-to-face stage began. The respondent was given the chance to fill in the online survey before the interviewer’s arrival to the house of a respondent at his/her

house. Altogether 49 respondents filled in the questionnaire online after the beginning of the face-to-face survey stage and before the interviewer’s visit (Figure 4).

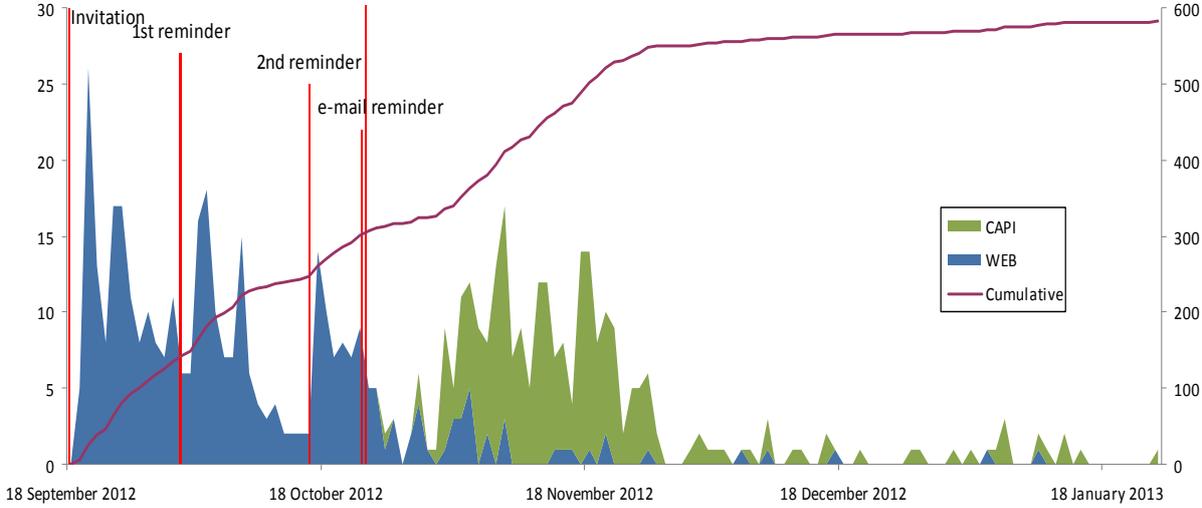


Figure 4. Share and timing of different modes in the total mixed mode survey data collection procedure

The majority of data collection was completed by December 2012, but fieldwork continued until 13 January 2013 in order to achieve the ESS response rate.

3.5 Data control and analysis

The ESS main survey fieldwork ended on 28 January 2013 and the ESS mixed mode fieldwork ended on 24 January 2013. The last online survey was filled in on 10 January 2013.

Table 3 presents the main outcomes of the mixed mode and main ESS after data control. The final response rate was quite similar for both surveys, slightly higher for the main ESS. In conclusion the mixed mode experiment did not produce a significantly different response rate. The refusal rate was slightly lower. The minimum target response rate set to a fieldwork agency was 65% (in Estonia 70% response rate is not expected). 60% from all mixed mode ESS sample was collected during online mode and 40% in face-to-face stage. Majority of the fieldwork activities with mixed mode sample ended in November (Figure 4), and the agency mainly worked on achieving the required response rate. Final share of non-contacts remained

in the mixed mode slightly higher than for the main ESS. The fieldwork agency seemed to be in a situation of finding the optimal end time for the fieldwork in terms of efforts and results. It seemed that they finished the mixed mode fieldwork efforts soon after achieving 65% response rate. Nevertheless, this reflects an authentic fieldwork situation where agencies are taking different interest into account.

Table 3. Outcomes and process of the ESS main and the ESS mixed mode survey in Estonia

	ESS	ESS mixed mode	
	Main	Total	Online mode
Initial sample	3,702	925	925
Number of final respondents	2,380	586	356 (60% from all mixed mode ESS)
Response rate	67.8%	66.2%	40.1%
Refusal rate	9.7%	8.6%	24.3% (did not start the online survey but participated in F2F)
Non-contact	10.7%	11.8%	-
Other (health reasons etc)	11.7%	13.1%	-
Ineligible	5.2%	4.3%	-
Survey period	1 September 2012 to 28 January 2013	19 September 2012 to 24 January 2013	19 September 2012 to 24 January 2013

Altogether 381 persons began some kind of activity online. 310 (81%) of them finished the survey online at once without any breaks. This result was surprisingly good. 46 people paused at some stage, but still finished. Those who paused produced altogether 99 break episodes. 25 respondents started online, but did not finish. Five of them were later interviewed in the face-to-face stage. Their reasons for not completing the online survey, were a lack of time and problems with the Internet connection.

225 persons did not start the online survey, but participated in the face-to-face stage. We also studied their refusal to participate in the online survey. They had to select answers from a

closed-ended list + option other. It was possible to mark several reasons. The results were as follows:

80 did not have Internet access or had a poor connection

71 did not have the skills to use the Internet

51 had no time

18 were too lazy

16 found the survey too long to be filled in online

16 never respond to messages or survey requests online

13 did not like to use the Internet

13 did not think that the survey was important

3 did not trust the Internet, thought it was not secure

3 found that there are too many surveys

2 said their family members advised them not to participate

24 cited other reasons (the survey was in English; I sent it, but it got lost)

0 previous negative experiences

0 did not like the topic of the survey

4. Cost and benefit ratio of the ESS mixed mode experiment

This chapter analyses the financial costs and benefits of the mixed mode survey in Estonia compared to the main ESS. It was assumed that an online survey could help to save costs on account of the interviewers' salary, which forms a major part of the ESS fieldwork budget. By employing sequential design, at least one third of the respondents were expected to use the online questionnaire and two thirds to reply in face-to-face mode. As can be seen from the Estonian results, more than half of all the respondents (60%) used the online mode.

However, the hypothesis of lower costs was not firm. There were doubts that fieldwork agencies might not be able to make adequate cost estimations because of their lack of experience, and will not take the financial effect of the online survey into account during the public procurement procedure for the right to carry out fieldwork. It was also argued that online surveys have their own indirect and hidden costs, which cancel out the benefit of the smaller need for fieldwork man-hours.

The initial cost analyses of mixed mode experiment in Estonia can be made based on the results of the public procurement procedure (Table 4). Estonia has established the obligation to carry out a public procurement for all works whose budget exceeds €30,000. The call for tenders included ESS specifications and the requirement that at least 500 mixed mode survey and 2,000 main ESS respondents must be achieved. Four agencies sent their tenders. As **Table Three out of the four estimated their mixed mode experiment costs per respondent to be lower than in case of a face-to-face survey (Table 4).** The fourth agency found that the mixed mode would be more expensive. This agency was, however, the least experienced in the field of social surveys and was later eliminated from the process because of its lack of experience.

Table 4. Costs of mixed mode and main ESS per achieved interview (from tender documents)

	Tender 1	Tender 2	Tender 3	Tender 4
Mixed mode, €/respondent	25	51	28	36
Main ESS, €/respondent	38	56	41	21
Experiment % from the main ESS	66	91	68	171

The cost estimations per one mixed mode respondent from more experienced fieldwork agencies varied from 66% up to 91% compared to the 100% of a main ESS respondent (Table 4).

Several new aspects of fieldwork costs emerged as the process of survey preparations and fieldwork started. They are highlighted in Table 5 according to additional cost and benefits.

In conclusion, we found that expenses for mixed mode preparations were quite equal with the financial benefits in Estonia. The unexpected expenses were mainly related to:

1. Novelty of the online survey design;
2. Additional workload due to the need to prepare two data collection modes;
3. Technical difficulties to prepare an online survey according to good ESS standards.

Table 5. Additional costs and financial benefits of the mixed mode survey compared to the main ESS

More expensive	Cheaper
1. The wording of questions in the online questionnaire proved to be quite different from the F2F questionnaire. It led to additional translation, which needed around 30 hours more work , compared to the CAPI version.	1. Two reminder letters produced around 100 additional respondents. Calculations show that the costs of these interviews in F2F mode would have costs around €2,000, but expenses related to reminder letters vary between €1,100 and 1,500 (1,500 takes into account additional workload calculations).
2. Because of some questionnaire functionality differences in the online and F2F mode, additional modifications for the computer programme were needed.	
3. The standard computer platform used by the fieldwork agency was not very adaptive for the precise design needs of ESS (size of boxes, colours etc., the collection of time stamps for questions when navigating back, and changing the response to questions that have already been submitted). Ordering relevant unusual modifications caused additional costs.	2. More respondents replied online than planned by the fieldwork agency (initial plans 60 –100, final result 356). Around 100 responses were received after a reminder letter and were taken into account in the cell above. 256 respondents were left as a benefit of online approach. The total benefit of it was €5,120.
4. The fieldwork data protocol for the mixed mode survey was more complicated compared to CAPI and needed additional efforts in different survey stages. (At each log-in, the time, date, and user agent string was collected. At each log-off, the time, date, and user agent string was collected. In addition, the last question seen before logging off was recorded etc.)	
5. A meaningful combination of all final data files from the Internet (richer information) and CAPI and their unification required special efforts compared to main CAPI.	
Total	
Two additional man-hour months = €5,000	€5,600

Mixed mode surveys become cheaper if the wording, programming and design of online and face-to-face questionnaires can be kept as similar as possible. The standardisation and central distribution of survey specific programmes can also diminish costs.

The total benefits of online surveys depend also on the Internet - and computer-friendliness of population, as more online respondents make the mixed mode more cost-effective. The length of an ESS was seen as one of the main challenges in the preparatory stage. The results of the Estonian experiment showed that this was not the main problem related to the survey response rate, although it was mentioned by some respondents. The online response rate improves when the habit of using the Internet becomes more widespread among the population. Majority on people who did not respond to online mode, did it because lack of Internet access, poor connection or lack of the skills to use the Internet.

5. Sampling, respondent bias, and response rate

Additional benefits expected from online stage of the mixed mode survey were:

- 1) An increase in the overall response rate thanks to the more active participation of younger and highly mobile respondents. It was assumed that the online mode makes it easier to reach younger and more mobile respondents who are the main source of non-contacts and refusals.
- 2) It was assumed that an online survey is generally more attractive and motivates some respondents to participate. The security of their home and no need for face-to-face contact could for example encourage middle-aged reluctant respondents to participate.

The sampling procedure for the mixed mode experiment was similar to the main ESS sampling in Estonia. The frame was taken from the Population Register. The sample used was an individual random sample covering population of 15 years of age and older. According to plans, the final achieved sample of mixed mode was to include at least 500 people. The target response rate was set at 65%, and 17% of the sample was estimated to consist of ineligible responses.

Sampling design: Explicit and implicit stratified systematic random sampling with a proportional allocation in stratum was used. A register of people aged 15 and above with a permanent residence was divided into explicit strata by their registered address according to NUTS 3 regions. Each explicit stratum was then ordered by ID numbers (reflecting gender and age). The size (number of persons aged 15+) of each explicit stratum and its proportion were found from the extracted register referred to above.

The gross sample size was multiplied by the respective proportion in order to get the sample sizes for the respective explicit stratum. Systematic random samples were drawn from each explicit stratum resulting in the implicit stratification of each stratum (age and gender). For the implicit stratum, proportional allocation was approximate.

Table 6. Mixed mode respondents (%) by gender and NUTS region, and a comparison with data from the 2011 Population Census and the main ESS

Region	Gender	Census	Mixed mode sample	Mixed mode experiment respondents			ESS main respondents
				Total	CAWI	CAPI	
North	Male	19	18	15	18	11	15
	Female	23	23	22	24	19	22
West	Male	5	6	5	5	6	5
	Female	6	6	7	6	9	7
Central	Male	4	5	5	4	6	5
	Female	5	5	6	6	6	6
North-West	Male	5	5	6	5	6	6
	Female	7	7	7	5	11	7
South	Male	11	11	11	12	10	12
	Female	13	13	14	14	15	16

Table 7. Mixed mode respondents by gender and age group (%), and a comparison with data from the 2011 Population Census and the main ESS

Age group	Gender	Census	Sample	Mixed mode experiment respondents			ESS main respondents
				Total	CAWI	CAPI	
15–24	Male	8	7	7	9	4	7
	Female	7	7	8	10	6	7
25–34	Male	8	9	6	7	4	6
	Female	8	9	8	10	5	7
35–44	Male	8	8	6	8	4	7
	Female	8	8	8	9	7	8
45–54	Male	8	8	8	8	8	7
	Female	8	9	9	8	9	9
55–64	Male	7	7	7	6	7	7
	Female	9	8	10	10	10	10
65+	Male	7	7	9	6	13	8
	Female	14	14	14	7	23	17

Table 8. Mixed mode respondents (%) by gender and education, and a comparison with data from the 2011 Population Census and the main ESS

Education (ISCED)	Gender	Census	Mixed mode experiment			ESS main respondents
			Total	CAWI	CAPI	
ISCED 0	Male	0	0	0	0	0
	Female	0	0	0	0	0
ISCED 1	Male	2	2	1	3	1
	Female	3	2	1	3	2
ISCED 2	Male	11	6	6	7	8
	Female	9	8	6	11	10
ISCED 3	Male	18	17	16	17	18
	Female	18	20	17	24	18
ISCED 4	Male	3	5	4	6	6
	Female	4	7	5	9	10
ISCED 5	Male	11	12	16	6	9
	Female	20	20	25	13	18
ISCED 6	Male	0	1	1	0	0
	Female	0	1	1	0	0

The final response rate for the mixed mode survey was 66%, which did not differ much from the response rate of the main ESS. The final achieved total mixed mode sample was representative of the sample in terms of the region of residence, age group, education and gender. Differences between the data of the 2011 Estonian Population Census and the collected sample were very small (Tables 6, 7, 8). The mixed mode sample was also very similar to the sample achieved in the main ESS.

The main difference of the mixed experiment survey modes was that the online mode was more often selected by younger and more educated respondents who lived in northern Estonia (more urbanised). Gender differences were detected less than expected, but then again, there are no gender differences in Internet use in Estonia either.

In conclusion, we can state that the online mode helped us to capture those respondents who are usually difficult to reach, but it did not improve the final respondent structure of the mixed

mode ESS compared to the main ESS. One explanation for that may be that the response structure of the main ESS was already very close to the ideal.

6. Social desirability and mode effect

One reason why different survey modes may produce different answers is the presence of an interviewer. Some questions are more sensitive than others in terms of social desirability. Tourangeau and Yan (2007: 860) define three types of questions that cause social desirability bias. First, questions that related to sensitive and taboo topics. These questions are culture-specific, such as attitudes towards immigrants, sexual behaviour. Second, there are questions related to social norms, for example fulfilling one's duty as a citizen by voting and following the law. The third group of questions is linked to image management behaviour such as social position.

The current chapter studies answers about voting behaviour, attitudes towards immigrants and subjective social position, self-reported health and education to find out the possible mode effect. We used multinomial and binary logistic regression models (Table 9), in which a survey mode is a categorical variable, and answers of online respondents from the mixed mode experiment and CAPI respondents from the mixed mode experiment are contrasted with the answers of the respondents of the main ESS 2012. Region, place of residence, first language at home, income, education, employment status, year of birth, gender, children living at the household are the control variables in all models.

Previous works (Tourangeau and Yan 2007: 860) demonstrate that voting behaviour can be a socially biased question on which people tend to report less in the online mode than in a face-to-face interview. Table 1 shows that it is not the case in the Estonian online mode, as the respondents (after controls) reported considerably higher voting rates online compared to the main ESS. There were no differences in the results of the mixed mode CAPI and main ESS CAPI results. In Estonia, the voting behaviour produced opposite results to what was expected. The reason might be that people who use the Internet more vote online and are indeed more active voters, but this hypothesis requires more studies.

Table 9. Effect of survey mode on responses, reference is ESS main CAPI mode (regression coef., multinomial and binary logistic regression models)

Dependent variable	Contrasted categories	Mixed online		Mixed CAPI	
		B	p	B	p
Voted at the last national election	yes/no	0.77	***	-0.23	
Allow many/few immigrants of same race/ethnic group as the majority	many/some	-0.45	**	0.24	
	a few/some	-0.45	*	-0.06	
Allow many/few immigrants of a race/ethnic group different from the majority	many/some	-0.46	*	-0.05	
	a few/some	-0.39	*	-0.28	
Allow many/few immigrants from poorer countries outside Europe	many/some	-0.30		0.07	
	a few/some	-0.24		0.08	
Immigration – bad or good for the country's economy	bad 0&1/other	0.60	**	0.22	
The country's cultural life – undermined or enriched by immigrants	undermined 0&1/other	0.69	**	-0.38	
Immigrants make the country a worse or better place to live	worse 0&1/other	0.85	***	-0.01	
Subjective general health	very good/very bad	-0.30		-0.43	
Hampered in daily activities by illness/disability/infirmity/mental problems	yes/no	-0.79	***	-0.09	
Place in society	bottom/top	3.63	**	0.45	

* $p < 0.05$, ** $p < 0.01$ *** $p < 0.001$

Controls: region, place of residence, first language at home, income, education, main activity, year of birth, gender, children living at the household

Attitudes towards immigrants are a widely studied and sensitive topic. Previous studies have allowed us to assume that people answering online give more negative responses about immigrants than in face-to-face interviews. This was confirmed in the Estonian experiment (Table 9). Once again, no differences were revealed between the mixed mode CAPI and ESS CAPI.

We would like to highlight a specific pattern in attitudes towards immigrants. The answers to the question of how many immigrants of a specific group the respondents would allow in their

country are given on a 4-point scale: *allow many, allow some, allow a few, allow none*. No mode effect was revealed in contrasting the first two and the last two answers. Online respondents tended to choose *allow some* more than the respondents of the main ESS (in case of immigrants from poorer countries the difference was not statistically significant).

In questions about the influence of immigrants on the country, an 11-point scale was used. When contrasting all other categories with the most positive one, two of the most negative categories differed significantly. The two most negative points of the scale were contrasted with all others in the final analysis. It revealed that the respondents who answered online were more likely to choose these two most negative categories than the respondents of the main survey. This result was in accordance with the expectations.

The answers to questions about health could also be influenced by the presence of an interviewer. Clark Newman *et al.* (2002) show that to an interviewer, people tend to report their health as worse than they would when answering the questions without an interviewer. The results of our study are in accordance with these findings: compared to the main survey, online respondents reported being less hampered in their daily activities. But there was no mode effect in subjective self-evaluations of general health.

Social position can also be a sensitive question, as people might want to give a better impression of themselves to the interviewer (Veenhoven, 2002:8). People answering online were more likely to admit belonging to the bottom strata of society compared to the respondents of the main survey. But no social desirability bias was found in reporting higher education after controlling for place of residence, main activity, first language spoken at home, income, gender, year of birth and household composition. Online respondents were still more likely to report having attained higher education compared to the respondents of the main survey. In case of social desirability bias, the situation would have been the opposite.

In conclusion, we can report finding mode effect on responses related to social desirability. When an interviewer was present, people seemed to display a more positive attitude towards immigrants, report their social position to be higher and health worse. Voting behaviour did not produce the expected social desirability bias in Estonia: people answering online did not report lower but significantly higher voting rates.

7. Does the mode of data collection have an effect on data quality?

This chapter compares the quality of data from the mixed mode online and CAPI mode with the main ESS. There are several ways to evaluate the quality of survey data. The most straightforward approach is to analyse dataset completeness. The high non-response of an item can significantly lower the reliability of the whole study. The strength of the given criterion is the ease of its application.

The quality predictors compared are:

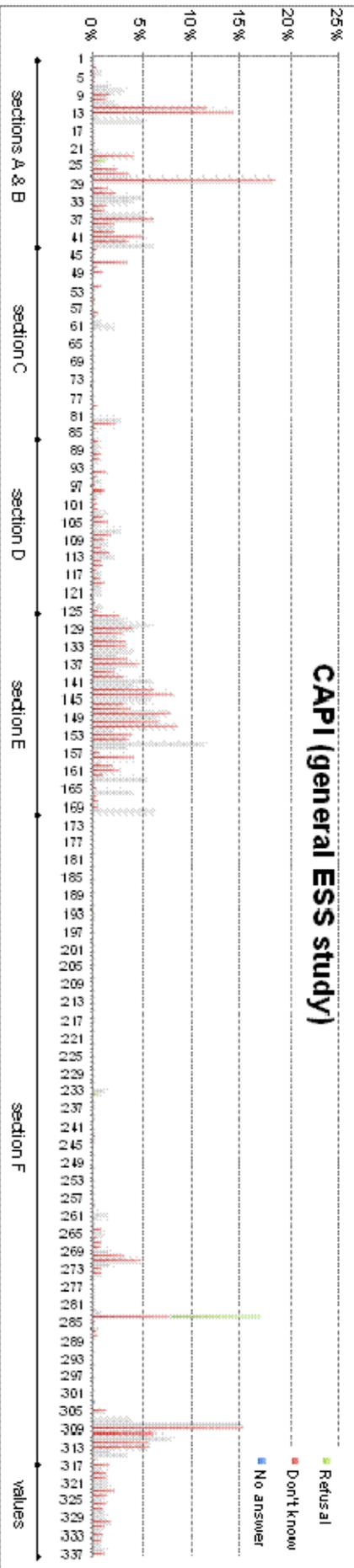
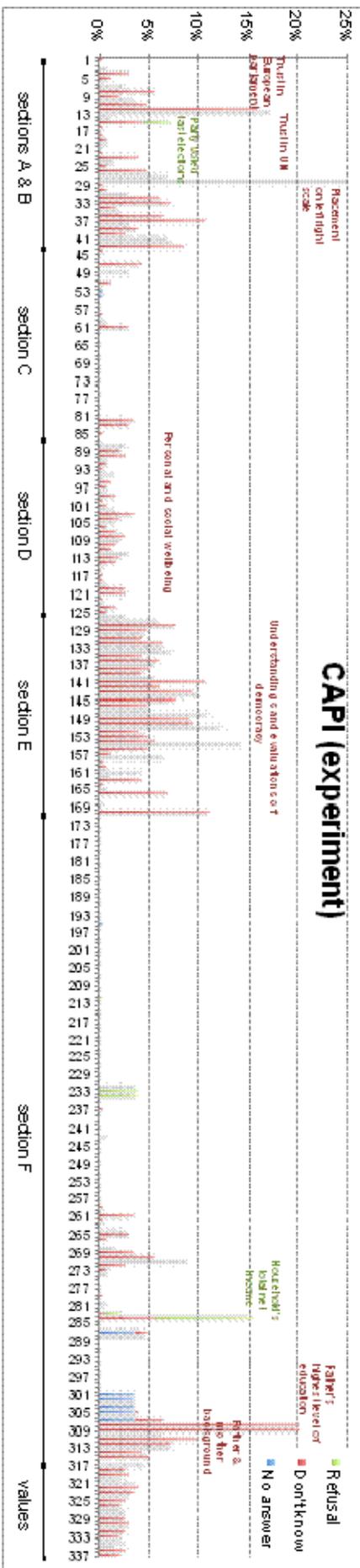
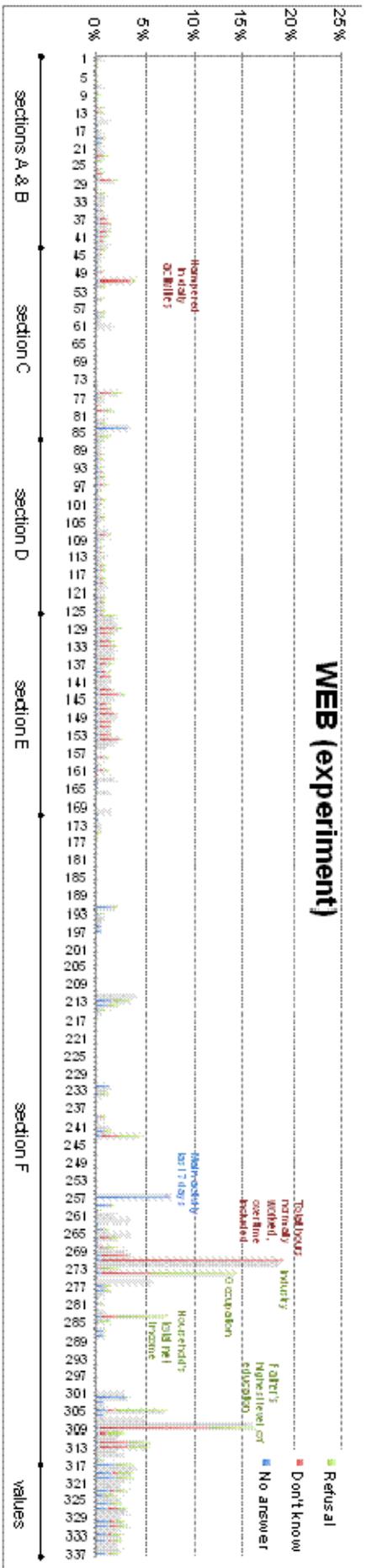
- 1) Occurrence of missing values: refusals, *don't know* answers and other missings;
- 2) Straight-lining cases;
- 3) Random answers.

7.1 Missing values

The first quality criterion analysed is the occurrence of missing values. It appears that the mixed mode survey CAPI mode featured the highest share of missing values (each question had an average of 2.3% missing values, mostly *don't know* answers). For the main ESS study and the experimental online study the same figure was around 1,5%. For both CAPI modes, the most problematic sections seemed to be sections A, B and E, where significantly more values were missing (Figure 5). In case of the online mode, the last H section was the poorest.

Figure 5 presents the share of missing values for each question. The patterns for both CAPI samples are very similar. While most questions about understandings and evaluations of democracy produce a similarly high percentage of *don't know* answers, sections B and F have some clear outliers. It seems that the most difficult questions were self-identification on the left-right scale, trust in the European Parliament, trust in the UN, household income and the father's education. The online survey has a different pattern – most questions, irrespective of the section, displayed a low percentage of missing values. Only a few certain household indicators about work and the father's education had a very high item non-response.

Based on the given data we can conclude that in general, the online mode produces much fewer item non-responses than the CAPI mode.



7.2 Straight-lining

This section analyses straight-lining behaviour in different data collection modes. The risk of straight-lining is especially high in question batteries. We analyse answers about understandings democracy in a 16-question block (E1–E16) with an 11-point scale from *not at all important for democracy in general* to *extremely important for democracy in general*. We analyse the percentages of respondents who used each scale point more than 10 times (70% of the number of questions), which might indicate straight-lining behaviour.

Depending on the response mode, 25–44% of the respondents used the right scale-point more than 10 times – less in online mode and more in the experimental CAPI mode (online = 25%, mixed mode CAPI = 44%, main ESS CAPI = 35%). The same pattern is revealed when comparing the percentages of the respondents who used the most positive scale point for all 16 statements (the relevant shares were 2.2% in online mode, 6.1% in experimental CAPI and 4% in the main ESS file).

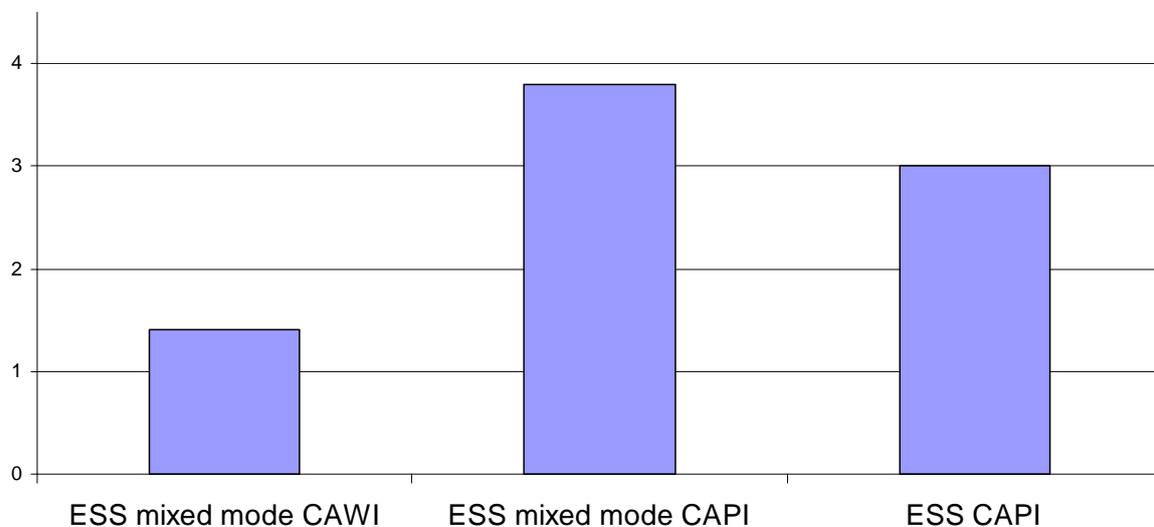


Figure 6. Share of respondents who used the same scale-point more than 15 times, while answering to 21 Schwartz value questions

The second test regarding straight-lining behaviour considers the final part of the questionnaire, which includes a value scale with 21 questions. As it is at the very end of a long questionnaire and it is known that response quality decreases with time, there is a higher probability for behaviours such as straight-lining or random answering at the end of surveys. Figure 6 compares the proportions of respondents who used the same scale-point more than

15 times (70% on the number of the question) while answering 21 value questions in different modes. The results are similar to earlier proportions, where online respondents used less straight-lining than CAPI respondents.

7.3 Random answers

Finally, the shares of respondents possibly giving random answers were compared. Again, we used the Schwartz value questionnaire, which follows from the Schwartz value theory (1992) to determine contradictory answers. The PVQ-21 questionnaire includes several indicator pairs, which should represent the same basic value. For the three most correlating pairs, response differences were calculated and if a person's responses deviates two or more scale points in case of all questions, it was reasonable to presume that the answers might be random. Figure 7 describes the proportions of these deviations. The results corresponded to the general pattern – online responses were of higher quality than CAPI responses. In case of the online survey, the percentage of random answers was 15%, while it was nearly 20% for the experimental CAPI sample.

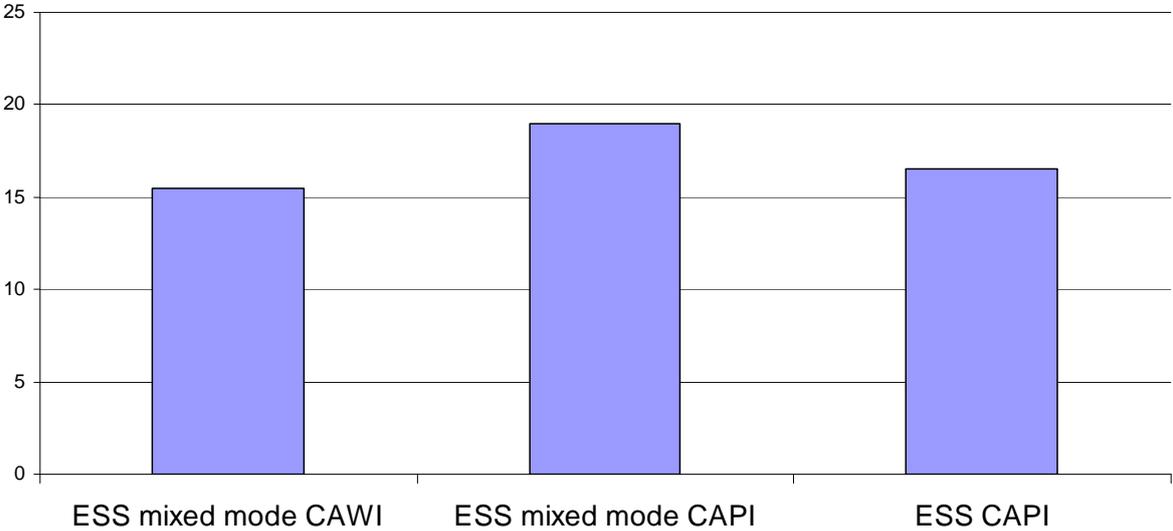


Figure 7. Share of respondents giving random answers

The better quality of the online mode may be related to the socio-demographic differences between samples. Including only individuals with higher education and comparing the missing value patterns of the main ESS study with the mixed mode online study, the CAPI

mode still had a much higher share of missing values than the online mode, referring to mode effect. **Finally, when comparing the main ESS data with all mixed mode study data, the mixed mode displayed less missing values, which is the effect of the online mode.**

Conclusions

The Estonian mixed mode experiment consisted of a sequential online mode followed by a face-to-face mode. This report compared the results of the mixed mode survey to the main ESS in terms of cost, response rates, response distributions, mode effects and data quality.

We concluded that despite the overall expectations that an online survey would be cheaper, the total expenses related to the mixed mode survey were quite equal with the financial benefits. A part of the expenses of the mixed mode survey was related to the novelty of the online survey design and technical difficulties. The central distribution of an online survey programme can essentially diminish these costs. Another source of additional expenses is the heavy workload related to the preparation of two data collection modes in different languages. These costs increase exponentially with the number of survey languages in a country. Mixed mode surveys can become cheaper if the wording and structure of the questionnaire in both survey modes can be kept as similar as possible. The total benefits of surveys which combine online and other modes depend on the Internet and computer access in a country, but in the longer perspective, the effectiveness of online surveys may increase thanks to the spread of Internet access and related skills.

The experiment proved that the online mode does indeed capture the younger and educated urban population better. This population is difficult to reach with the traditional face-to-face mode. Several data quality indicators proved the benefits of the online mode as well. However, preliminary analyses also detected mode effects, which could make it challenging to combine the data of the two modes.

The success of the Estonian mixed mode experiment stemmed from active data collection via the Internet. Mixed mode surveys are rare in Estonia, but all Estonians are informed about this approach, as the latest Population Census in 2011 used the same principle (mixing web and

face-to-face modes). 60% of Estonians filled the Population Census survey in online. The impressive work of the census team, who advocated the use of the web-based survey environment, might have had an impact on the ESS experiment as well, since ESS could take advantage of the fame of the census. Several ESS interviewers indicated that people do not know the differences between various international surveys and ESS might have partially benefitted from the imago and trust created by the Population Census a year earlier.

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