

Mixed mode data collection as a strategy to decrease panel attrition in the Swiss Household Panel

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by

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Introduction

The Swiss household panel (SHP) is, like most social surveys conducted in Switzerland, faced with the problem of attrition. Declining response rates are problematic, because they lead to smaller sample sizes and tend to create bias in the data, as nonresponse generally is not at random. It has been argued (de Leeuw, 2005) that the combination of different survey modes can decrease or compensate the weakness of a unimode survey. De Leeuw specifies that “survey designers choose a mixed-mode approach because mixing modes gives an opportunity to compensate for the weaknesses of each individual mode at affordable cost” (de Leeuw, 2005, p. 235). Until recently, the preferred mode of data collection in Switzerland was by telephone. But rising costs for high quality surveys and increasing nonresponse rates ask for alternatives. The introduction of other modes of data collection could be a possibility to decrease nonresponse.

To decrease attrition, the SHP¹ offered in Wave 12 (2010) for the first time to all refusing SHP members the option to complete the questionnaire in a different mode, with the option of Computer Assisted Personal Interviewing (CAPI) or Computer Assisted Web Interviewing (CAWI). The aim of this study is to assess the success of this first

¹ From 1999 to 2009 the SHP has been conducted exclusively over the telephone (with the exception of the SHP paper-and-pencil biographical survey conducted in 2001-2002).

exploration with different modes of data collection in the SHP. Although these new modes of data collection are currently used only for refusal conversion, they are a first step towards a potential future mixed-modes strategy of data collection.

The current study focuses on a comparison between the different modes in demographic characteristics and previous participation in the SHP and aims to answer three questions:

1. What were the response rates of the different modes of interview in Wave 12?
2. To what extent did respondents using the different modes differ demographically?
3. To what extent did the introduction of different modes of interview reduce nonresponse and nonresponse bias?
4. What are the characteristics of the CAWI respondents in terms of item nonresponse and previous wave nonresponse?

Theoretical background

Mixed mode: definitions

A mixed mode survey is a survey that combines the use of different modes of data collection, such as telephone, internet, face to face, or paper and pencil questionnaires. There are different possibilities for a mixed mode design as presented by de Leeuw (2005). For instance, people may be contacted with one mode and then interviewed in another one. De Leeuw (2005) describes such a procedure as a “mixed mode survey system” without mixed modes in the data collection. Mixed mode data collection is characterized by surveys that are conducted in a combination of modes such as web questionnaires, face to face interviews or telephone interviews. These different modes

can apply to different groups of respondents, different phases in the data collection, or to different parts of the questionnaire (de Leeuw, Hox, & Dillman, 2008; Martin, 2011).

In this paper, the term mixed mode defines exclusively the introduction of a mixed mode data collection, in which the alternative modes are introduced to a selection of respondents only. In the SHP mixed mode has been introduced for refusal conversion: CAPI and CAWI have been proposed to initial refusals, whereas the main mode for data collection is by telephone (CATI).

Mixed mode: Advantages and disadvantages

Using a mixed mode approach has two main advantages (de Leeuw, 2005). First, mixed mode data collection is employed to compensate coverage errors, and secondly to reduce nonresponse rates and nonresponse bias (Sala & Lynn, 2009). What does this mean for the SHP?

For the mixed mode approach used in the SHP only the second advantage is relevant, because alternative modes of data collection were only offered to households and individuals who refused to participate. All SHP members were already approached in previous waves, and all were initially approached by telephone. For prospective new samples, however, coverage might play a role as well. Although compared to other countries, Switzerland still has a high rate of registered land lines, their rates are declining (Ernst Stähli, Forthcoming; Voorpostel, et al., 2010). A mixed mode approach is a potential solution for this coverage problem.

The introduction of mixed mode to reduce attrition and bias is important for the SHP. Several studies have demonstrated that the SHP, like other household panels,

suffers from panel attrition, which is shown to be somewhat selective (Lipps, 2007; Voorpostel, 2010). In line with findings from other studies on nonresponse (see for an overview Lynn, Buck, Burton, Jäckle, & Laurie, 2005; Stoop, 2005), nonrespondents in the SHP are more likely to be younger, male, lower educated and unemployed, and less likely to be married and home owners. Offering a different mode of interview to initial nonrespondents might attract a group of reluctant respondents who otherwise would have been lost, which could potentially help to reduce nonresponse bias.

In this study we will assess the extent to which offering other modes of interviewing diminishes the bias in the SHP by comparing respondents in different modes on gender, age, education, civil status, and previous participation in the SHP.

Method and data

This study uses data from the twelfth wave (2010) of the Swiss Household Panel (SHP). The SHP is a nationwide survey that started in 1999, and has followed a random sample of households living in Switzerland on an annual basis ever since. Information is gathered at two distinct levels: on the household level and on the individual level. On the household level information about the household is gathered from a household reference person. The next step of data collection is interviewing all household members of 14 years and older². The SHP consists of two samples; SHP I which started in 1999 and SHP II which started in 2004. The main mode of data collection for the SHP is computer assisted telephone interviewing (CATI). In the twelfth wave all households were

² A proxy procedure is followed for household members younger than 14 and for household members who are unable to complete the individual questionnaire. For more information see the SHP User Guide on www.swisspanel.ch.

approached in this mode, and 4672 households and 7500 household members completed the interview by CATI.

An alternative mode was offered to the refusals only³. Households that refused to complete the household grid were re-contacted by telephone with the offer to conduct the household and individual interviews face-to-face (CAPI). Only two households opted for this mode, resulting in two household and three individual interviews in CAPI mode. These three respondents (two women and one man) were all older adults (between 78 and 83), two were married (to each other) and one was divorced.

Refusals on the individual level (after the household questionnaire was completed) were re-contacted and offered to complete the individual questionnaire online (CAWI). Of the 1962 household members who did not participate in the CATI questionnaire, 87 respondents chose CAWI as the preferred mode for the interview and were sent login information by e-mail. Of this group, only 43 respondents actually filled out the questionnaire online. Due to the limited numbers of face-to-face interviews, this study focuses on a comparison between CATI and CAWI only, presenting descriptive statistics of the group CATI respondents (N=7500), CAWI respondents (N = 43), respondents who were directed towards CAWI but did not complete the questionnaire (CAWI nonresponse, N = 44) and other nonresponse (refusal, language problems and other reasons, N = 1875). As the group sizes for CAWI and CAWI nonresponse are small we limit ourselves to a general comparison of the groups in demographic characteristics and in history of participation in the panel. The group sizes are too small to go into depth

³ This included regular respondents who refused at the current wave as well as past refusals contacted again. Current wave refusals were re-contacted with the CAWI option, whereas respondents who refused in previous waves were offered the CAWI option in the first contact.

regarding differences in the quality of the data between the different modes so we limit ourselves to a comparison of item nonresponse between the different modes.

Results

To examine the success of mixed mode as a strategy to diminish attrition and decrease the bias in the data, we below compare different groups. The CATI group is the group of respondents who agreed to participate and completed the telephone interview. The respondents who refused to participate, but agreed to complete the interview by CAWI is divided into two groups: those who indeed completed the online questionnaire and those who received login data but never completed the questionnaire. The differences between these groups are interesting, because they indicate the extent to which bias in the data can be diminished by offering CAWI as a possibility. The last group constitutes the respondents who did not participate in the telephone interview or in the CAWI interview.

Table 1 shows that 55.5% of the participants in W12 in the CATI group was female. In the group of respondents who were directed towards CAWI (both the CAWI participants as well as the CAWI nonrespondents) the gender division was more equal. Among the “other nonresponse” the percentage of men was highest. CAWI, although not popular among the SHP refusals, does seem to increase the share of men in the sample.

Table 1. Response by gender

	CATI		CAWI		CAWI nonresponse		other nonresponse	
	N	%	N	%	N	%	N	%
man	3341	44.5	21	48.8	23	52.3	1119	59.7
woman	4159	55.5	22	51.2	21	47.7	756	40.3
Total	7500	100.0	43	100.0	44	100.0	1875	100.0

In Table 2, a comparison by age is shown. Average age is highest among the respondents who completed the telephone interview. The average age among the group directed towards CAWI is slightly lower, although among them the youngest SHP members are least likely to complete the questionnaire. Still, younger refusing SHP members are more likely to opt for CAWI than the older SHP members.

Table 2. Age by response group

	N	Range	M	SD
CATI	7500	14-95	46.93	18.779
CAWI	43	14-75	42.42	14.131
CAWI nonresponse	44	15-58	33.80	14.214
other nonresponse	1873	13-90	44.88	19.122

Some differences by civil status emerge from Table 3. Among the CAWI and the CAWI nonresponse group taken together, the share of never married SHP members is larger. However, among this group the never married SHP members are least likely to ultimately complete the online questionnaire. In the end the difference between CAWI and CATI in civil status is relatively small.

Table 3. Response by civil status

	CATI		CAWI		CAWI nonresponse		other non-response	
	N	%	N	%	N	%	N	%
single, never married	2321	30.9	14	32.6	24	54.5	690	36.8
married	4028	53.7	22	51.2	16	36.4	1057	56.4
Divorced, separated	760	10.2	5	11.6	4	9.1	78	4.2
widower/widow	391	5.2	2	4.7			46	2.5
missing							4	.2
Total	7500	100.0	43	100.0	44	100.0	1875	100.0

Table 4 presents a comparison by education. Participants in the SHP (both CATI and CAWI) tend to be higher educated compared to the nonparticipants. Among the group who agreed to a CAWI questionnaire but did not complete it, the majority had either only compulsory schooling or upper secondary vocational level (75%). Of the group who completed the online questionnaire 51% had upper secondary vocational schooling.

Table 4. Response by level of education

	CATI		CAWI		CAWI non-response		other non-response	
	N	%	N	%	N	%	N	%
Compulsory schooling	1608	21.4	6	14.0	16	36.4	534	28.5
Upper secondary (vocational)	2761	36.8	22	51.2	17	38.6	755	40.3
Upper secondary (matura)	827	11.0	4	9.3	7	15.9	149	7.9
Tertiary level (vocational)	1161	15.5	5	11.6	2	4.5	222	11.8
Tertiary level (university)	1143	15.2	6	14.0	2	4.5	201	10.7
missing							14	.7
Total	7500	100.0	43	100.0	44	100.0	1875	100.0

To assess the quality of the data gathered in the different modes of interview, we compared the number of item nonresponse in the CATI and CAWI interviews. For this we calculated the number of times a respondent answered with “don’t know” or “refuse to answer”. The differences turn out to be quite large; whereas in the CATI interviews the mean was .72, it was 14.35 in the CAWI interviews. A table presenting the frequency of missing items in the two modes is presented in Appendix A. From the tables it shows that the CAWI interviews had more very high numbers of item nonresponse compared to the CATI interviews.

A last aspect we examined for the CAWI respondents and CAWI nonrespondents is their previous participation in the SHP. Appendix B shows the patterns of participation for the two groups separately by sample (SHP_I and SHP_II). The main conclusion we can draw is that respondents opting for an online questionnaire tend to have an irregular response pattern. Only in very rare occasions have respondents who participated in every wave opted for CAWI (and if they did, they completed the CAWI questionnaire too). When we look at participation in the previous wave, results show that 37 out of the 43 CAWI respondents did not participate or were mentioned in the grid only in the previous wave (Wave 11). Figures were similar for the CAWI nonrespondents; 37 out of the 44 did not participate or were in the grid only, and only 7 completed an interview in Wave 11. It seems that the CAWI procedure helped to cover a small group of people who were reluctant to participate in the wave before, although many of them ended up not responding again. In this sense the introduction of mixed mode helps to improve the data quality by keeping in touch with less motivated participants.

Conclusion and discussion

This study provides insight into the impact of the introduction of mixed mode data collection on nonresponse and nonresponse bias in the Swiss Household Panel. From 1999 to 2009 the SHP has been a CATI survey; since 2010 CAPI and CAWI have been introduced for refusal conversion. Mixed mode survey design is popular, but data quality and advantages and disadvantages of such data collection still have to be studied.

Our main conclusion emphasizes that very few initially refusing SHP members chose an alternative mode of interview. The low numbers of refusing respondents who opted for an online questionnaire (N=87) or a face-to-face questionnaire (on the household level, N=3) indicates that refusal in the SHP is not strongly related to the mode of interview. There might be several reasons for why only few respondents opted for a different mode. First, as the SHP has been following the two samples annually since 1999 and 2004, SHP members have built up a routine in answering the questionnaire by telephone. Offering a different mode after several waves of data collection may not convince many refusing SHP members. Respondents for whom a different mode might have made a large difference most likely have dropped out already in previous waves. Secondly, after several years of participation refusals might be “hard refusals”, for whom a change in mode is not sufficient to be converted into continued participation. This idea is supported by the fact that respondents who opted for CAWI tended to have very irregular response patterns and many did not complete the CAWI questionnaire in the end.

Half of the respondents who chose CAWI did not complete the online questionnaire. This indicates that the individuals who chose to conduct a CAWI might have used this option as a hidden refusal. Yet, the group that completed the CAWI questionnaire tended to have characteristics that were slightly different from the CATI and, if larger numbers had been reached, this would have diminished the bias by demographic characteristics and history of participation. Unfortunately, with such small numbers, the benefits for the data in Wave 12 are limited. If numbers increase in the future, however, the approach seems promising in this respect.

De Leeuw (2005) emphasizes mixed modes as a way to balance costs and benefits of different modes of data collection. Given that adding a mode of interview increases costs (preparing web or face-to-face questionnaires, training interviewers) it requires a certain number of participants to choose these modes to make the mixed mode approach worthwhile. Although in this wave of the SHP the use of alternative modes of data collection was very limited, the results regarding the characteristics of the CAWI respondents provide some indication that for the future – especially the planned third sample of the SHP – the use of a mixed mode strategy should be considered.

In the next waves of data collection for the current two samples of the SHP, the mixed mode approach tested in Wave 12 will be continued. Based on our positive experience with CATI over the last decade and the lower levels of item nonresponse for this mode, CATI will remain the main mode of interview. For the SHP_I and SHP_II there will be one main data collection method – CATI – plus a nonrespondent follow-up offering CAWI and CAPI.

For the new sample of the SHP, SHP_III, the envisioned strategy is to start with a face-to-face interview to improve the recruitment rate and to administer a base-line questionnaire and a biographical questionnaire to household members. The options for different modes (CATI, CAWI, or CAPI) in the interviews following the initial CAPI will be assessed.

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Appendix A

Table A1 number of "don't know" and "refuse to answer" - CAWI

	Freq.	Percent	Cum.
0	7	16.28	16.28
1	3	6.98	23.26
2	4	9.30	32.56
3	2	4.65	37.21
4	4	9.30	46.51
5	2	4.65	51.16
6	1	2.33	53.49
7	1	2.33	55.81
10	1	2.33	58.14
11	2	4.65	62.79
12	1	2.33	65.12
14	2	4.65	69.77
17	1	2.33	72.09
19	1	2.33	74.42
21	1	2.33	76.74
22	1	2.33	79.07
24	1	2.33	81.40
28	1	2.33	83.72
29	1	2.33	86.05
34	1	2.33	88.37
35	1	2.33	90.70
41	1	2.33	93.02
64	1	2.33	95.35
74	1	2.33	97.67
81	1	2.33	100.00
Total	43	100.00	

Table A2 number of "don't know" and "refuse to answer" - CATI

	Freq.	Percent	Cum.
0	7,991	70.80	70.80
1	1,610	14.27	85.07
2	664	5.88	90.95
3	324	2.87	93.82
4	250	2.22	96.04
5	153	1.36	97.40
6	98	0.87	98.26
7	49	0.43	98.70
8	49	0.43	99.13
9	26	0.23	99.36
10	18	0.16	99.52
11	20	0.18	99.70
12	5	0.04	99.74
13	8	0.07	99.81
14	3	0.03	99.84
15	2	0.02	99.86
16	5	0.04	99.90
17	2	0.02	99.92
18	3	0.03	99.95
20	1	0.01	99.96
21	1	0.01	99.96
23	1	0.01	99.97
24	1	0.01	99.98
25	1	0.01	99.99
26	1	0.01	100.00
Total	11,286	100.00	

Appendix B

. = missing
 0 = individual questionnaire
 1 = proxy questionnaire
 2 = household grid only

group: CAWI

SHP I

STATUS99	STATUS00	STATUS01	STATUS02	STATUS03	STATUS04	STATUS05	STATUS06	STATUS07	STATUS08	STATUS09	STATUS10
0	0	0	0	0	0	0	0	.	.	.	0
.	.	.	.	.	.	.	.	.	.	.	0
0	0	0	0	0	0	0	0	0	0	2	0
0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	2	2	0	0	0	0	0	.	0
2	1	2	2	2	0	0	0	0	0	2	0
0	0	0	0	0	0	0	.	.	.	.	0
1	2	2	2	.	.	.	.	0	.	.	0
0	0	0	0	.	.	.	.	0	.	.	0
.	.	.	.	.	.	.	.	.	.	.	0
0	0	2	2	2	.	.	.	2	.	.	0
0	0	0	2	2	.	.	.	2	.	.	0
1	1	1	1	2	.	.	.	2	.	.	0
2	2	0	0	0	.	.	.	.	.	0	0
0	0	0	0	0	0	0	0	0	0	2	0
0	0	0	0	0	2	2	2	2	2	2	0
0	0	0	0	0	0	.	.	.	.	.	0
0	0	0	0	0	.	.	.	.	.	2	0
0	0	0	2	2	2	2	0	0	0	2	0
0	0	0	0	0	0	0	0	0	0	2	0
2	0	.	.	.	.	.	.	0	2	.	0
0	0	0	0	0	.	.	.	0	2	.	0
0	0	0	0	0	.	.	.	0	0	2	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	2	0
0	0	0	0	0	0	0	0	.	0	2	0
0	0	0	.	2	.	.	.	0	0	2	0
1	1	1	.	2	.	.	.	1	1	1	0
.	.	.	.	.	.	.	.	2	0	2	0
2	0	0	0	0	0	.	.	.	.	2	0
2	0	0	0	0	0	.	.	.	.	2	0
0	0	0	0	0	.	.	.	.	.	2	0

SHP II

STATUS99	STATUS00	STATUS01	STATUS02	STATUS03	STATUS04	STATUS05	STATUS06	STATUS07	STATUS08	STATUS09	STATUS10
.	0	.	.	.	2	2	0
.	2	2	.	0	0	0	0
.	0	0	.	0	0	0	0
.	0
.	0	0	0	0	.	.	0
.	0	.	.	.	.	.	0
.	2	.	.	.	.	.	0
.	2	.	.	.	.	.	0
.	0	0	0	0	.	.	0
.	0	0	.	2	2	.	0
.	2	.	.	.	0	.	0

Number of cases read: 43 Number of cases listed: 43

group: CAWI nonresponse

SHP I

STATUS99	STATUS00	STATUS01	STATUS02	STATUS03	STATUS04	STATUS05	STATUS06	STATUS07	STATUS08	STATUS09	STATUS10
0	0	0	0	0	2	2	0	0	.	.	2
0	0	0	0	2	2	2	0	0	.	.	2
1	1	1	1	1	.	.	1	1	.	.	2
0	0	.	.	.	.	.	.	0	0	0	2
2	0	.	.	.	.	.	.	0	0	0	2
0	0	.	2	2	.	.	.	0	0	0	2
1	1	.	1	1	.	.	.	0	0	0	2
1	1	1	1	1	0	0	0	0	0	2	2
1	1	1	1	1	1	1	1	0	0	0	2
0	0	0	2	0	.	.	2	.	2	2	2
0	0	0	0	0	0	0	0	0	0	2	2
2	2	2	2	.	2	2	0	0	.	.	2
2	2	2	2	.	.	.	.	2	.	.	2
1	1	1	1	2	0	2	0	0	0	0	2
0	0	0	.	0	.	.	0	0	0	0	2
2	0	0	0	.	0	0	0	.	.	.	2
2	0	0	0	0	2	2	0	2	2	2	2
1	1	1	0	0	1	2	0	0	0	2	2
1	1	1	1	1	2	2	0	0	0	2	2
1	1	.	.	.	.	.	.	1	2	.	2
1	1	.	.	.	.	.	.	0	0	.	2
0	0	0	0	0	2	.	2	.	.	.	2
1	1	1	1	1	1	.	1	.	.	.	2
.	.	.	.	.	.	.	.	.	.	.	2

SHP II

STATUS99	STATUS00	STATUS01	STATUS02	STATUS03	STATUS04	STATUS05	STATUS06	STATUS07	STATUS08	STATUS09	STATUS10
.	2	.	.	.	2	2	2
.	1	1	.	1	1	2	2
.	0	0	0	.	.	.	2
.	0	0	0	0	0	2	2
.	2	2	2	2	.	.	2
.	2	1	.	.	.	2	2
.	0	0	2	0	.	.	2
.	1	0	0	0	0	2	2
.	0	.	.	.	2	2	2
.	0	.	.	.	.	.	2
.	2	2	2	2	.	.	2
.	0	2	2	2	.	.	2
.	0	2	0	.	.	2
.	1	1	1	.	.	2
.	2	2	2	1	.	.	2
.	2	2	2	1	.	.	2
.	2	.	.	.	2	.	2
.	2	.	.	.	.	.	2
.	2	.	.	.	.	.	2

Number of cases read: 44 Number of cases listed: 44