

International Nonresponse Trends across Countries and Years: An analysis of 36 years of Labour Force Survey data

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Abstract : Household survey nonresponse is a matter of concern in many countries. In one of the first international trend analyses, de Leeuw and de Heer (2002) found that response rates declined over the years, and that countries differed in response rates and nonresponse trends. Their analyses cover longitudinal data on the Labour Force Survey from National Statistical Institutes for the period 1980 to 1997. We added a new data set, covering the period 1998 -2015, and analysed nonresponse data over time and countries. In these analyses we differentiated between voluntary and mandatory surveys. The trends visible in de Leeuw and de Heer (2002) continue with possibly a small deceleration in refusal rates.

1. Introduction

Survey practitioners have been noticing an increasing nonresponse trend for years. Already in 1992, Bradburn stated “We all *believe* strongly that response rates are declining and have been declining for some time. Part of the problem is locating respondents, and part of the problem is getting respondents.” This sentiment was also expressed by both Brehm (1993:16-17) and Groves (1989:182) who stated that nonresponse rates are getting worse and that participation in the *USA* is declining for government, academic, and commercial surveys.

For the *USA*, some empirical basis for these statements is provided by Steeh (1981), who found that refusals in two well-known academic studies (the National Election Studies and the Consumer Attitudes Survey) increased between 1952 and 1979; Steeh did not study noncontacts separately. Curtin, Presser, and Singer (2005) performed a follow-up for the US Survey of Consumer Attitudes covering the period 1979 to 2003. They showed that the overall response rates were decreasing over time, that part of it was caused by an increase in noncontacts, especially after 1985, and that part was due to an increase in

refusals. Atrostic, Bates, Burt, and Silberstein (2001), developed a set of consistent nonresponse measures for six major US governmental household surveys. They concluded that nonresponse increased for all six surveys in the period 1990 to 1999. Finally, Williams and Brick (2017) updated nonresponse trends for household surveys conducted in the US since 2000. They conclude that overall response rates decreased in the period 2000-2014. Both noncontacts and refusals increased, though the magnitude of increase differs between studies.

European and international trend data are scarcer, Stoop, Billiet, Koch, and Fitzgerald (2010, chapter 5) present data from the first three rounds of the European Social Survey (ESS). They notice a slight increase in response rates from an average of 60% in the first round ESS1 in 2002 to 61.6% in ESS2 and 62.8% in ESS3. This change is accompanied by a decrease in the variation of response rates across countries; countries with a low response rate improved over time and this may be attributed to increased fieldwork efforts. However, this hopeful outcome did not persist after seven rounds of the ESS. Over a period of 12 years (2002-2014) the ESS collected seven rounds of data in 36 countries. A careful analysis (Beullens, Loosveldt, Vandenplas, and Stoop, 2018) showed a tendency for response rates to decrease over time. The differences found over time are in line with the effect sizes reported by de Leeuw and de Heer (2002) for official statistics. Beullens et al (2018) also demonstrated that although noncontact rates appeared to decrease, probably due to increased fieldwork efforts, refusal rates did increase and that obtaining cooperation has become increasingly difficult.

Within the framework of the International Workshop on Household Survey Nonresponse, de Heer (1999) initiated an international nonresponse questionnaire that was sent yearly to contacts at governmental survey agencies in different countries. The resulting trend data were analyzed by de Leeuw and de Heer (2002). They covered the period 1980-1997 and found that response rates have indeed been declining over the years. Both noncontact rates and refusal rates increased over time. Furthermore countries differ in the acceleration of refusal rate.

Does the nonresponse trend as reported by de Leeuw and de Heer (2002) continue in the new millennium? Furthermore, do nonresponse trends in official statistics follow the same trend as those in social statistics as reported by Beulens et al (2018) with a clear trend in growing refusal rate, but not in noncontacts? To answer this question, we have added new data to de Heer's original data set, extending the time period to 2015. The results of the analysis of this combined data set are described here.

2. Data and methods

2.1. Data

Two data sets were available for analysis. The first data set was collected by Wim de Heer in the international survey on nonresponse and covers the period 1980-1997 (de Leeuw and de Heer 2002). The second data set was collected by Annemieke Luiten and covers the period 1998-2015 (Luiten, de Leeuw, Schouten, and Hox 2016).

De Heer Data

During the first meeting of the International Workshop on Household Survey Nonresponse in Stockholm 1990, an international questionnaire with questions on response, survey design, and fieldwork was

developed and sent to key informants at governmental statistical agencies. To be able to investigate response trends, data on continuing surveys or surveys repeated over time (e.g., Labour Force Survey) were requested and agencies were asked to provide as much retrospective data as possible (for details, see de Heer, 1999). This was repeated over time and the last data collection took place in 1997. In 1999, all collected response data were sent to the international contacts with the request to carefully check the data. This resulted in a data set with trend data for the Labour Force Survey in 16 countries: Australia, Belgium, Canada, Denmark, Finland, France, Germany, Hungary, Italy, the Netherlands, Poland, Slovenia, Spain, Sweden, United Kingdom, and the United States (for details, see de Leeuw and de Heer 2002, Appendix).

Luiten Data

In 2015, new trend data were collected on the Labour Force Survey (LFS). The new questionnaire was based on de Heer's original questionnaire, with added questions on mixed mode-designs and fieldwork effort. A retrospective inventory was used: respondents were asked to report on response, refusal and contact rates from 1998 to 2015. Data were collected in 2016. The questionnaire was sent out to all European Labour Survey data collection agencies, as well as non-European countries (e.g., Australia, New Zealand, Canada, and the USA). In total, 25 countries responded to this new international questionnaire on nonresponse. From the original de Leeuw and de Heer (2002) data set Denmark and Belgium did not participate in the second data collection, new countries that provided data were Austria, Bulgaria, Croatia, Iceland, Latvia, Lithuania, Malta, Norway, Portugal, Slovakia, and Switzerland.

Combined Data

The de Heer and Luiten data were combined into a single data set containing 27 countries (see Appendix). The de Heer data set still made a distinction between former East and West Germany; the more recent Luiten data set contained data for the unified Germany only. In the combined dataset the data from the former East and West Germany were averaged into one country 'Germany' by calculating the mean of the two response rates for each year, thereby harmonizing the data for Germany. Three countries had two sets of data for 1998, one from the de original de Heer data and one from the new Luiten data (Slovenia, Sweden and the UK). The differences were very small - all smaller than 0.5 percent points- and the 1998 data for these three countries were replaced by their average.

We computed proportions and empirical logits for response, noncontacts, and refusals. We coded the time variable year as actual year minus 1998, which makes the time coding consistent with the coding used in de Leeuw and de Heer (2002).

2.2. Methods

A longitudinal multilevel analysis (Hox, Moerbeek, and van de Schoot 2018) was carried out on both the de Heer data (16 countries) and the Luiten data (25 countries) separately, as well as on the combined data set (27 countries). As the combined data set includes countries that exist only in one of the two data original data sets, this assumes no hidden relation between being missing in one of the data collections and the missing response rates, implying a Missing At Random (MAR) assumption. We also carried out separate analyses on the more limited data set of the 14 countries that contributed data to both de Heer and Luiten data sets. The results were highly similar; we therefore report only the results for the large combined data set containing data from 27 countries.

We first analyzed trends for total response and subsequently for noncontacts and refusals. Two important

components of nonresponse are noncontacts and refusals (e.g., AAPOR, 2016; de Leeuw and de Heer 2002). Potential factors influencing contactability (e.g., at home patterns, physical impediments, such as guarded apartments, voice-mail, and interviewer call patterns) are different from potential factors influencing willingness to cooperate (e.g., mandatory nature, saliency of topic, survey attitude). For overviews see for instance, Groves and Couper (1998), Stoop (2005), Groves, Dillman, Eltinghe, and Little (2002). Furthermore, not all noncontacts are unwilling when contacted and increased fieldwork effort, such as increased contact attempts, is a common approach to improve overall response rates (Stoop et al, 2010; Williams and Brick, 2017). This is illustrated by the findings of Beullens et al (2018) who report that in the ESS noncontact rates appeared to decrease over time, but refusal rates did increase. Therefore, in our analysis the dependent variables were (the empirical logit for) overall response, noncontacts, and refusals.

Year was used as an explanatory variable. To examine potential differences in trends between the early (1980-1997) de Heer data and the new (1997-2015) Luiten data, we conducted an independent samples difference test on the regression coefficients for year (Cohen, Cohen, West & Aiken 2003: 46-47). Finally, whether or not a survey is mandatory will have a marked influence on cooperation, but not on accessibility (contact) (e.g., de Heer, 1999; de Leeuw and de Heer, 2002). In several countries, the LFS is a mandatory survey, while in most countries it is voluntary. Fortunately, we could add this variable to the complete data set and include the contextual variable 'mandatory' in the analyses.

3. Results

3.1. General trends in response rate

First, we study the trends in overall response rates for the combined data over the whole time period 1980-2015, as well as for the time periods 1980-1997 (de Heer data) and 1997-2015 (Luiten data) separately. The general trend is that overall response is still decreasing over the years. The Intra Class Correlation (ICC) is 0.88, indicating that the variance between countries is much higher than the variance over time within countries.

Table 1 shows the results for a reanalysis of the de Heer data set (period 1980-1997), and the analyses of the Luiten data set (period 1998-2015) and the combined data (period 1980-2015). The parameter estimates for year are significant and negative for all three data sets; indicating a downward trend in response rates. Furthermore, it is important to note that that the difference in year trends between the de Heer and the Luiten data sets is nonsignificant. This means that the same downward trend in overall response shown in the early de Heer data is continuing after 1997: response is decreasing steadily over the years.

Table 1. Multilevel Regressions on Response Logit LFS. Estimates and (standard errors)

	de Heer Data 1980-1997	Luiten Data 1997-2015	Combined Data 1980-2015
Intercept	1.709 (.2494)	1.332 (.1874)	1.540 (.1662)
Year	-0.031 (.0038)	-0.035 (.0028)	-0.054 (.0020)
Mandatory	0.880 (.3754)	0.929 (.2797)	0.925 (.2490)

Var(residual)	0.037 (.0042)	0.058 (.0045)	0.127 (.0081)
Var(countries)	0.551 (.2095)	0.477 (.1422)	0.405 (.1172)

All parameter estimates are significant ($p < .05$). Difference in year trends between de Heer and Luiten is nonsignificant, $p = 0.40$

The regression coefficient of -0.054 for year for the combined data translates approximately to 0.73 percent points less response per year or 1.46 percentage points every two years. This supports the findings of Beullens et al (2018), who report negative effects on response rates of 1 to 1.5 percentage points between the biennially rounds of the European Social Survey.

As expected, the overall response is higher when a survey is mandatory. The regression coefficient for mandatory of 0.925 is significant and translates to approximately 11.4 percent point more responses for mandatory surveys. Finally, the variance across countries is considerable, indicating large overall differences between countries in response rate.

3.2. Trends in Noncontact rates

To obtain a more detailed picture of the trends in survey nonresponse over time, it is necessary to go into the major components of nonresponse: noncontacts and refusals. For noncontacts, the trend already discerned in de Leeuw and de Heer (2002) continues when new data are added: noncontacts are steadily increasing over the years. The results are summarized in Table 2; again the results for the early data (1980-1997), the new data (1997-2015) and the total period are presented. The ICC is 0.86, indicating that the variance between countries is much higher than the variance over time within countries.

Again the parameter estimates for the variable year are significant and positive in all data sets. Furthermore, the difference in year trends between the two separate data sets is nonsignificant. This means that also for noncontacts the early (1980-1997) trend shown in the de Heer data is continuing after 1997: for the Labour Force Survey noncontact is still steadily increasing over the years. The regression coefficient of 0.036 for year for the combined data translates to approximately 0.29 percent points more noncontacts per year. This is different from the findings of Beullens et al (2018) for the European Social Survey, who report a decrease of noncontact over time and attribute this to an improvement of the ESS fieldwork efforts based on the experiences in the first round of the ESS (see also Stoop et al, 2010).

Not surprisingly, whether or not a survey is mandatory has no influence on the noncontact rate. The effect of the survey's mandatory nature on the general response trends as shown in our analysis (section 3.1.) is not driven by changes in the noncontact rates. Also for noncontacts the variance across countries is considerable, again indicating clear overall differences between countries in the noncontact rate.

Table 2. Multilevel Regressions on Noncontact Logit LFS. Estimates and (standard errors)

	de Heer Data 1980-1997	Luiten Data 1997-2015	Combined Data 1980-2015
Intercept	-2.659 (.2111)	-2.552 (.1977)	-2.541 (.1813)
Year	0.036 (.0057)	0.030 (.0034)	0.036 (.0020)
Mandatory	-0.112 (.3320) ^{ns}	-0.202 (.3115) ^{ns}	-0.262 (.2785) ^{ns}

Var(residual)	0.066 (.0084)	0.069 (.0058)	0.104 (.0072)
Var(countries)	0.384 (.1542)	.525 (.1639)	0.484 (.1423)

Parameter estimates are significant ($p < .05$), unless indicated by n.s. (nonsignificant) as is the case for the variable mandatory. Difference in year trends between de Heer and Luiten is nonsignificant, $p = 0.37$

3.3. Trends in Refusal rates

For refusals, the trend also continues when new data are added: refusals are also increasing over the years. However, here we see a remarkable change: the difference in year trends between the de Heer data and the Luiten data is significant ($p = 0.01$). In the new data, the regression coefficient for year is still positive and significant, but smaller than the corresponding coefficient in the old data set (0.03 vs 0.06). This indicates that although refusals are increasing also in the new data, the rate of increase of refusals has become smaller in the new millennium. For the combined data, the regression coefficient of 0.046 translates to approximately 0.25 percent point more refusals per year. The ICC is 0.94, indicating that the variance between countries is much higher than the variance over time within countries.

Table 3. Multilevel Regressions on Refusal Logit LFS. Estimates and (standard errors)

	de Heer Data 1980-1997	Luiten Data 1997-2015	Combined Data 1980-2015
Intercept	-2.446 (.2658)	-2.407 (.2000)	-2.502 (.1946)
Year	0.055 (.0077)	0.034 (.0033)	0.046 (.0022)
Mandatory	-1.421 (.4179)	-1.590 (.3153)	-1.582 (.2988)
Var(residual)	0.120 (.0153)	0.068 (.0057)	0.123 (.0084)
Var(countries)	0.605 (.2430)	0.538 (.1683)	0.557 (.1640)

All parameter estimates are significant ($p < .05$). Difference in year trends between de Heer and Luiten is significant, $p = 0.01$

Before we showed that when a survey is mandatory the overall response is higher, but –as expected– the mandatory or voluntary status of the LFS does not influence contactability. Table 3 shows that the refusal rate is indeed clearly lower when a survey is mandatory. The effect of the survey’s mandatory nature on the general response trends is therefore driven by changes in the refusal rate.

The regression coefficient for the variable mandatory is significant, and its estimate of -1.582 translates to approximately 9.3 percent points less refusal if the survey is mandatory. Also for refusals, at country level the variance across countries is considerable; this indicates large overall differences between the countries in refusal rates.

4. Conclusion/Discussion

Adding new trend data to the data analyzed by the Leeuw and de Heer (2002) paints a somewhat pessimistic picture: nonresponse continues to increase over the years. The early trend for the period

1980-1997 continues in the years 1998 to 2015. However, when we look at the nonresponse components separately, we find that noncontacts are steadily increasing, and that refusal rates seem to be increasing more slowly in the more recent data. When we take a more detailed look at the trends for response, noncontacts, and refusals separately, we notice that whether or not a survey is mandatory influences response rates. This is driven by an effect on refusals: mandatory surveys have lower refusal rates. The variable mandatory has no effect on noncontacts. This fits the theories on survey nonresponse (e.g., Groves and Couper, 1998); noncontacts should be attributed to design factors and fieldwork strategies, not to the voluntary or mandatory status of a survey.

The slower rate of increase in refusals found for the LFS may reflect changes in survey practice and design, such as the use of incentives, refusal conversion, and responsive design (e.g., Groves and Heeringa 2006). The initial publications on increasing survey nonresponse led to renewed efforts to reduce nonresponse, and many theoretical and empirical publications on reducing nonresponse appeared in the period 1998-2005 (e.g., Groves and Couper, 1998; Groves, Dillman, Eltinge and Little 2002; Stoop 2005; Stoop et al. 2010). That these efforts have partially paid off can be seen in the slower rate of increase of refusals in the new millennium; nevertheless refusals do continue to increase.

Contrary to the ESS, we did not find a slowing down of the increase in noncontact rates. This could be partially due to a difference in focus on fieldwork procedures between official statistical institutes, who are mainly responsible for the Labour Force Survey, and the ESS. For the LFS an increase in fieldwork efforts aiming at noncontacts may help in stabilizing the downward trend. Furthermore the large between country variance detected in the analyses shows that countries differ in the rate of increase both of total nonresponse and its main components noncontacts and refusals. More research into differences between countries, their survey climate and fieldwork procedures, is necessary to investigate the origin of this. Differences in, for example, proxy rates, interviewer contracts, refusal conversion practices and the use of incentives, all contribute to differences between countries in response level.

Such country differences in sampling and fieldwork procedures could explain the response differences between countries. Unfortunately, for the de Heer data fieldwork details are not available, and in the Luiten data they are missing for many countries. For a subset of our data, contextual effects on response rates are analyzed in Luiten, de Leeuw and Hox (2018). In the present analysis, we focus on long trends over time and ignore (keep constant) changes in fieldwork over time. This will result in a conservative bias in the estimated trends, because changes in fieldwork procedures may often be introduced to counter observed negative trends in response rates.

Our analyses depend on self-reports of international statistical agencies to an international questionnaire on nonresponse over the period 1980-2005. These self-reported response rates may differ from official response rates as reported by for instance Eurostat. For the years 2006-2015 Eurostat provides harmonized annual quality reports for the LFS for European countries online (<https://ec.europa.eu/eurostat/web/lfs/publications/quality-reporting>). These reports indicate large differences between countries in response, refusal and noncontact rates, which are consistent with our finding of a high ICC for these variables. Although the overall correlation between the Eurostat response figures and our data is very high ($r > 0.95$), there are some discrepancies. Some of these discrepancies are due to differences between fieldwork data and official reports based on cleaned data; others may be due to reporting errors. Most of the discrepancies between our data and the Eurostat reports are very small and there is no clear trend in these discrepancies. For our analyses, we have relied on the self-reported (questionnaire) data by the statistical agencies, because these span a much larger range of years and countries, including non-European countries

Fighting nonresponse is a continuing battle. Part of the battle is reducing nonresponse as far as possible, and trying to slow the current trends. That this is possible is shown in the European Social Survey, where increased fieldwork efforts stabilized and even reduced noncontacts (Beullens et al, 2018). Furthermore, the slowing down in refusal rates in the LFS also is a hopeful sign. Part of the battle, is also to gather more information on nonrespondents and assess the potential of nonresponse bias for important surveys (e.g., Couper and de Leeuw, 2003; Groves and Petcheva, 2008; Stoop, 2005) in order to better weigh and adjust for nonresponse. As response rates continue to decrease, one of the major challenges that remain is the understanding of nonresponse and nonresponse bias, and the development of sophisticated statistical methods for low response rate surveys (Singer 2006).

Appendix

Countries included in each data set

Country	de Heer data (1980-1997)	Luiten data (1998-2015)
Austria	-	+
Australia	+	+
Belgium	+	+
Bulgaria	-	+
Canada	+	+
Croatia	-	+
Denmark	+	-
Finland	+	+
France	+	+
Germany	+	+
Hungary	+	+
Iceland	-	+
Italy	+	+
Latvia	-	+
Lithuania	-	+
Malta	-	+
the Netherlands	+	+
Norway	-	+
Poland	+	+
Portugal	-	+
Slovenia	+	+
Slovakia	-	+
Spain	+	-
Sweden	+	+
Switzerland	-	+
United Kingdom	+	+
United States	+	+

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