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Item Nonresponse as a Predictor of Unit Nonresponse in a Panel Survey

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In face-to-face interviews, both unit nonresponse and item nonresponse can be considered as a negative reaction of the respondent. Given this basic common element, we test the hypothesis that the same factors are responsible for unit and item nonresponse and that both kinds of nonresponse are related to each other. To investigate the relationship between item nonresponse and unit nonresponse a panel survey is used. With panel data the amount and pattern of item nonresponse realized during the first wave of a panel can be used to predict the unit nonresponse in a second wave of a panel. The results show that – in the context of a panel survey and controlling for some relevant respondent characteristics – several kinds of item nonresponse during the first interview are indeed related to the unit nonresponse of a second interview.

Key words: Answering process; threatening questions; difficult questions.

1. Introduction

In a face-to-face interview, an interviewer tries to obtain a positive reaction to the request to participate in the survey and during the interview he or she expects the respondent to give substantive answers to the questions. A negative reaction of the respondent to these expectations results in either unit nonresponse or item nonresponse. Unit nonresponse occurs when a sampled respondent refuses to participate in the interview. Of course there are other causes of unit nonresponses, but in this article, we are particularly interested in refusals. Although item nonresponse can arise when the interviewer fails to ask an applicable question or to record an answer, it can also be the result of a negative reaction of the respondent to a question asked by the interviewer, where a substantive answer could be expected. As a consequence, a negative reaction of the respondent can be a common element of both unit nonresponse and item nonresponse. Given this common element one can hypothesize that the same factors are responsible for unit and item nonresponse and that the two kinds of nonresponse are related to each other. In the next section this general hypothesis is further elaborated.

2. Background

To explain the negative reaction of the respondent that results in item nonresponse a general cognitive theory about answering questions can be used. In this theory, several

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stages of cognitive processing are distinguished: interpreting the question to understand its meaning, retrieving relevant information, integrating that information into ''private'' judgement, and formatting and editing a response. Editing is based on considerations of social desirability and self-presentation (Sudman, Bradburn, and Schwarz 1996; Tourangeau et al. 2000). In this context, Krosnick defines the concept of ''satisficing.'' Satisficing means that the answering process does not result in an optimal answer but merely in a satisfactory answer. Item nonresponse, more particularly ''don't know'' and ''no opinion'' answers, can be considered as one form of satisficing and occurs when there is not a smooth and optimal proceeding of the answering process because of the respondent's lack of motivation and ability. One may expect poor ability and a lack of motivation to result in a higher frequency of item nonresponse. Satisficing is not only a function of the respondent's motivation and ability but is also dependent on the task difficulty. The task difficulty is determined by the difficulty of each of the cognitive stages of the answering process (Krosnick 1991). This cognitive approach to the answering process makes clear that item nonresponse can have different causes and different meanings. Item nonresponse expresses various evaluations by the respondent of the question asked: the question is too difficult, not interesting, too embarrassing or too threatening. Therefore it is necessary to distinguish different types of item nonresponse.

Within the cognitive approach to the answering process, item nonresponse is seen as a defect for which the respondent is mainly responsible. The respondent is also responsible for his or her decision to cooperate or refuse. In fact, one can consider the request to participate in an interview as the first and, indeed, special and important question of the interview. One may expect the process that produces an answer to the first question asked during the doorstep contact to be similar to the answering process during the interview. This basic assumption is not shared by Groves and Couper who believe ''that the influences towards item nonresponse are quite different from those of the initial acceptance of the interview'' (Groves and Couper 1998, p. 22). However, there is some empirical evidence that the way respondents react and behave during the doorstep contact is related to the way the respondents perform their role during the interview. Couper found that statements made by respondents during the doorstep contact are associated with their responses to the subsequent interview, both in terms of the amount of information and the substantive content of those responses. Respondents with a ''not interested'' reaction in terms of the interviewer's request for an interview are less likely to provide ''substantively meaningful'' data (Couper 1997, pp. 334–336). Other research results suggest that ''what respondents say on the doorstep will be reflective of their general commitment to the interview process, with respondents who made negative comments on the doorstep being more likely to offer ''don't know'' answers, to refuse to answer questions and to be less inclined to search for documents, whereby respondents who made positive/neutral comments showed the reverse pattern.'' (Campanelli and Sturgis 1997, pp. 4–73). These findings support the assumption that the reaction processes for unit nonresponse and item nonresponse are similar. However, further examination of the relationship between unit and item nonresponse is necessary to make clear which aspects of the processes are important in both kinds of nonresponse.

It is not easy to investigate the relationship between unit nonresponse and item nonresponse. Data from a cross-sectional survey are not sufficient to analyze this relationship.

Within this research design there is no information available about item nonresponse for refusers, and the relationship between doorstep information and the information obtained during the interview can only be investigated for respondents who decided to participate in the interview. However, in contrast with a cross-sectional survey, a panel design provides more possibilities for analyzing some aspects of the relationship between unit nonresponse and item nonresponse. More precisely, with panel data the item nonresponse realized during the first wave of a panel can be used to predict the unit nonresponse in a second wave of a panel. With this specification of the direction of the relationship (item nonresponse → unit nonresponse), the cognitive explanation of item nonresponse (see above) can be used to formulate some hypotheses about the occurence of panel nonresponse. In this context, it is relevant to make the distinction between the amount and the pattern of item nonresponse. The amount of item nonresponse refers to the number of unanswered questions. We assume that a lot of item nonresponse is an indication of lack of interest, motivation, and ability to answer the questions, and we expect that respondents characterized by a high degree of item nonresponse in an interview will be more likely to refuse the request of the interviewer to participate in a subsequent interview. The pattern of item nonresponse refers to which questions are sensitive to item nonresponse. Relevant characteristics of the questions are those used in the cognitive approach to the answering process: embarrassing or threatening questions, difficult questions and substantive important questions (Tourangeau et al. 2000). We expect that item nonresponse to threatening or difficult questions which are strongly related to the substantive topic of the questionnaire will be a good predictor of unit nonresponse. Therefore, we assume that respondents with item nonresponse for these questions remember the interview during the first wave as a negative or unpleasant experience and they are more likely than others to refuse the second interview (Loosveldt 1998).

In testing these hypotheses, we will control for relevant respondent characteristics that are correlated with item nonresponse and can also affect unit nonresponse (e.g., interest in the topic of the questionnaire, gender). Some of these respondent characteristics can be related to the cognitive aspect of answering questions (e.g., age, education). In the next section the data used in the analysis are described.

3. Data

In our analysis, data are used from the Belgian General Election Study (Carton et al. 1993; Beerten et al. 1995). More precisely, the interviews conducted in the Flemish region of Belgium[2] are used from that survey. The main parts of the questionnaire of this election survey were about voting behavior, left and right in politics, political participation, political objectives, evaluation of political socialization, and election campaigns.

Immediately after the national elections of November 1991, the Inter-university Center for Political Opinion Research (ISPO, K.U.Leuven – Belgium) conducted the first wave of the election study in Flanders. Voting in Belgium is compulsory and there is no

[2] The data collection for the Flemish region was organized by the Inter-university Center for Political Opinion Research (ISPO, K.U. Leuven – Belgium), sponsored by the Federal Services for Technical, Cultural and Scientific Affairs. The data were originally collected by Jaak Billiet, Marc Swyngedouw, Ann Carton, and Roeland Beerten. Neither the original collectors of the data nor the Center bear any responsibility for the analysis or interpretations presented here.

Table 1. Nonresponse rate for the first and the second wave of the Belgian general election study (Flanders) (per cent)

Category	First wave	Second wave
First wave	62.7	68.3
Refusal	23.0	22.0
Non-contacted	6.7	2.9
Ineligible	5.1	4.6
Other non-interview	2.5	2.2
N	4,287	2,580

information available from voting registers. The national register was used to draw the sample of voters. A two-stage self-weighting sample (see e.g., Särndal, Swensson, and Wretman 1992, pp. 141–144) was used. The sample is representative of the Flemish population aged 18–75 years. The response rate was 62.7%. The second wave took place after the national elections of May 1995. Due to financial restrictions, only 2,580 respondents were used during the second wave of the panel. Both surveys utilized face-to-face interviews. All interviewers were given a list of respondents' addresses. The interviews took place at the homes of the respondents. The interviewer had to contact the respondent up to three times if he or she was not found at home at the first attempt. The nonresponse rates for the first and second waves are presented in Table 1.

During the first wave of the panel, 62.7% of the sampled respondents were interviewed. Given this nonresponse rate, weight adjustments for nonresponse during the first wave were used in the analysis. In the weighting procedure known population distributions about three variables were used: age, sex, and voting behavior in the 1991 General Elections (Carton et al. 1993). In fact, the weight adjustments are a ''post-stratification'' (Kalton and Kasprzyk 1986).

More than one-fifth (22%) of the panel respondents refused to participate a second time. It is clear that ''refusal'' is the most important reason (69.5%) for the nonresponse in the second wave of this panel. A refusal is an active act of the respondent. In other cases of nonresponse (non-contacted, ineligible[3] and other non–interview), the respondent's role is less important. Refusals are also a different phenomenon and it is not good practice to aggregate the different reasons for nonresponse (Groves and Couper 1998). Given this difference and our research questions we decided to drop these categories in the analysis.

The data from these two waves of the Belgian General Election Study allow one to evaluate the effect of item nonresponse during the interview of the first wave on the nonresponse (refusals) of the second wave of a panel survey.

4. Results

To test the previously formulated hypothesis the following steps for each type of item nonresponse are conducted. Firstly, the type of item nonresponse is operationalised using the data of the Election study and the bivariate association with the unit nonresponse is

[3] Ineligible cases are wrong addresses and deceased, ill/disabled, and demented people.

described. Secondly, the partial effect of the type of item nonresponse is evaluated. Gender, education, and political interest are considered as relevant respondent characteristics (Kalton, Lepkowski, Montanari, and Maligalig 1990; Rizzo, Kalton, and Brick 1996). Education is included because it is generally accepted that it is easier to interview more educated respondents. Since they are better trained in cognitive activities, they have more skills to express their responses (Loosveldt 1997; Loosveldt, Carton, and Pickery 1998). Gender is included because of the subject of the survey and the recurrent research findings that women usually have less interest in and knowledge of politics (Carton 1993). One might also expect that individuals who are more interested in politics will also be likely to participate in an interview about politics.

4.1. The effect of item nonresponse for difficult questions

One of the more difficult tasks during the interview of the first wave was rating six political parties on three different 11-point scales.[4] An explicit ''don't know'' filter was included in the question, but it was not mentioned on the show card given to the respondent. This indicates that the researchers expected answers from a respondent for all the questions of the task. Nearly two fifths (38.1%) of the respondents never used the ''don't know'' response alternative. However, almost 20% used it at least 9 times out of 18 (6×3 questions). The mean number of ''don't know'' answers was 4.22 with a median of 2. These results support the idea that at least some groups of respondents find these questions quite difficult. If the respondents are not sufficiently motivated or capable of performing their role and expending the mental effort necessary to generate optimal answers, this difficult part of the questionnaire falls apart. These questions are not only difficult, but their content is also strongly associated with the general topic of the questionnaire. For respondents with a lot of ''don't know'' answers to these questions, the answering process did not go smoothly because of a lack of motivation and/or ability, and the interview of the first wave of the panel must have been an unpleasant experience. As a consequence, a second interview about the same topic is not attractive and we expect that the probability of a negative reaction to the request for this second interview increases when the number of item nonresponses for these difficult and substantive important questions increases. The bivariate association between the item nonresponse for these questions and the unit nonresponse is presented in Table 2. To create a convenient table, the numbers of item nonresponse were grouped into six categories.

Although the increase in the percentage of refusals is not perfectly linear, it is clear that – as expected – the probability of a refusal in the second wave increases with an increase in the item nonresponses during the first wave. The difference between the lowest item nonresponse group (0–2) and the highest item nonresponse group (15–18) is striking. Compared with the lowest group, the percentage of refusals nearly doubles in the highest group (21.4 versus 36.5). Results of a logistic regression in which the probability of a negative reaction to the request to participate (probability of refusal) is modeled, confirms this effect (Table 3). After controlling for gender (0 = female, 1 = male), education[5]

[4] The three 11-point scales are: Catholic – non-Catholic; business completely free – community supervision; Flanders – Belgium must decide.

[5] For the variable education there are two categories: low = less than higher secondary education (high school), high = more than higher secondary education.

Table 2. Refusals in the second wave of a panel by number of item nonresponses for difficult questions in the first wave of the panel

Number of item nonresponses (first wave)	0–2	3–5	6–8	9–11	12–14	15–18
% refusals (second wave)	21.4	23.2	31.2	27.4	28.3	36.5
n	(1,286)	(301)	(265)	(139)	(162)	(173)

Chi-square = 28.64; $df = 5$, $p < 0.001$.

Table 3. Logistic regression predicting refusal in Wave 2 from gender, education, political interest, and number of item nonresponses for difficult questions in Wave 1

Variable	Standardized estimate	Probability	Odds ratio
Gender	−0.051	0.07	0.830
Education	−0.086	0.00	0.680
Political interest	−0.047	0.13	0.924
Item nonresponse	0.083	0.00	1.029

(0 = low, 1 = high), and political interest[6] (a high score means large interest), there is still a significant (partial) effect of the number of item nonresponses for difficult questions. In this analysis the numbers of item nonresponses for difficult questions are not grouped and vary from 0 to 18.

The standardized estimates of the parameters in Table 3 show that education and the number of item nonresponses for the difficult questions have the strongest effect. The effect of political interest and gender is not significant. The probability of obtaining a refusal significantly decreases for more highly educated respondents. As expected, there is a positive effect of item nonresponse: more item nonresponse for difficult questions results in a higher probability of unit nonresponse. One can use the odds ratio to describe this effect more precisely. Using the parameters of the logistic model, an odds ratio (refusal/response) can be calculated to compare the highest item nonresponse group (number of item nonresponses = 18) with the lowest item nonresponse group (number of item nonresponses = 0). This odds ratio equals 1.67 ($= e^{18*0.0683}$).[7] This means that the odds (refusal/response) in the highest item nonresponse group is 1.67 times higher than in the lowest item nonresponse group.

4.2. The effect of item nonresponse for threatening questions

In general, the income question in a survey interview and questions about politics can be considered sensitive questions. Moore, Stinson, and Welniak report that more than a quarter of the wage and salary data in the U.S. Current Population Survey is missing or incomplete because of the respondents' lack of knowledge or because respondents are reluctant to report (Moore, Stinson, and Welniak 1999). Overreporting of voting indicates

[6] Two indicators are used to measure political interest: a question about reading political news in the newspapers and a question about discussing social and political issues among friends (5-point scale: completely agree to completely disagree).

[7] To calculate this odds ratio the non-standardized parameter is used = ln 1.029 = 0.0286.

that questions about politics and political preference are also sensitive (Presser 1990). Therefore, one can also expect some resistance to answer questions about political preference.

To measure the net monthly household income a two-step procedure was used. Firstly, an open question was asked. 40% of the respondents did not answer the open question. This high percentage indicates that the income question is indeed a rather threatening question. If there was a ''no answer'' for this open question, the interviewer had to ask a follow-up question. The follow-up question was a closed question with a list of income categories. So it is possible that the interviewers are also responsible for the high percentage of item nonresponse for the open question. Probably some of them did not ask that question and anticipated the easier to ask follow-up question. This is an argument for assuming that the interviewers asked the closed question. Nearly 10% (9.5%) of the respondents refused to answer this closed question. These respondents strongly resist answering the income question. For them there is no information available about their income. (The coding of this dummy variable is: 0 = an answer for the income question; 1 = item nonresponse.) As expected, there is a significant relationship between the item nonresponse for the income question and the reaction to the request to participate in the second wave of the panel (*chi-square* = 16.28, $df = 1$, $p < 0.001$). More than one-third (35.8%) of the respondents who did not answer the income question refused to take part in the second interview. For the respondents who answered the income question the refusal rate is only 23.5%.

The questions about political preference are key questions in the Election Survey. To register the actual political preference, the respondent was asked which political party she or he voted for in the general elections (24/11/91) for the Chamber of Representatives. There is no information available for this question for 4.5% of the respondents. (The dummy was coded in the same way as the income variable: 0 = an answer on the political preference question; 1 = item nonresponse.) This low percentage of item nonresponse suggests that the political preference question is not a threatening one. However, it is possible that the respondents of the first wave of the panel tend to be interested in politics and are willing to express their opinions about politics and their voting behavior. The research finding that negative statements such as ''I'm not interested'' during the doorstep contact are negatively related to participation (Campanelli and Sturgis 1997, pp. 4–17) is in line with this hypothetical explanation of the low item nonresponse rate for the political preference question. The relationship between the item nonresponse for the actual political preference question and the decision to participate or not in the second interview is as expected: 31.5% refusals among those who did not answer the political preference question, as against 24.4% among those respondents who did answer (*chi-square* = 2.798, $df = 1$, $p = 0.09$).

The results of the logistic regression with the background characteristics and the two item nonresponse variables (income and actual political preference) show that only the item nonresponse on the income question still has a significant and strong effect (Table 4). Controlling for the other variables, respondents who did not answer the income question have 1.6 times higher odds for refusal than the respondents who answered the income question. The odds ratios for the background variables are very similar to those found in the previous section.

Table 4. Logistic regression predicting refusal in Wave 2 from gender, education, political interest, item nonresponse on the income question, and political preference question

Variable	Standardized estimate	Probability	Odds ratio
Gender	−0.059	0.03	0.806
Education	−0.094	0.00	0.655
Political interest	−0.069	0.02	0.886
Item nonresponse			
Income question	0.076	0.00	1.609
Pol. preference	0.024	0.36	1.226

Table 5. Mean number of item nonresponses, percentage of respondents with no item nonresponse and percentage of refusals by item nonresponse on four attitude scales

Scale	Economical and political conservatism		Authoritarianism		Political efficacy		Ethnocentrism	
Mean	0.19		0.10		0.06		0.52	
% respondents	89.4		94.2		95.8		77.0	
	0*	1*	0*	1*	0*	1*	0*	1*
% refusals	24.8	23.6	24.5	28.2	24.3	34.5	23.1	30.1
n	(2,082)	(246)	(2,192)	(135)	(2,230)	(97)	(1,792)	(535)
	$Chi^2 = 0.186$, $df = 1$ $p = 0.66$		$Chi^2 = 0.938$, $df = 1$ $p = 0.33$		$Chi^2 = 5.20$, $df = 1$ $p = 0.02$		$Chi^2 = 10.81$, $df = 1$ $p = 0.00$	

*0 = no ''no-opinion'' answer; 1 = at least one ''no-opinion'' answer.

4.3. The effect of item nonresponse to attitude questions

The Election Survey questionnaire contains several attitude scales. In our analysis we use four of these scales: an economic and cultural conservatism scale (11 items), an authoritarianism scale (7 items), a political efficacy scale (5 items), and an ethnocentrism scale with 13 items about ethnic minorities. The same 5-point scale and response card were used for these four scales (1 = completely agree – 5 = completely disagree). In the introduction to the ethnocentrism scale and the economic and cultural conservatism scale the ''no opinion'' answer was explicitly mentioned. However, this response category was not on the response card. Clearly, the researcher expected substantive answers. The respondents are expected to use one of the substantive response categories on the card. Answering these attitude items is much easier than answering the difficult questions. We consider the ''no opinion'' answers to these attitude items to be more an expression of reserved motivation than an indicator of poor ability to answer the questions. In line with the ''don't know'' answers for the difficult questions, we expect fewer ''no opinion'' answers for the attitude items. The results support this expectation. In Table 5, the average number of ''no opinion'' answers and the percentage of respondents with no item nonresponse are reported for each scale. The averages are small and the percentages are large. This means that the item nonresponse for these four scales is small. For this reason we decided to create a dummy variable for each scale: 0 = no ''no-opinion'' answer; 1 = at least one ''no-opinion'' answer.[8]

[8] The correlations between these four item nonresponse variables are too small to create a reliable scale.

Table 6. Logistic regression predicting refusal in Wave 2 from gender, education, political interest, and item nonresponse on two attitude scales

Variable	Standardized estimate	Probability	Odds ratio
Gender	−0.057	0.04	0.81
Education	−0.093	0.00	0.66
Political interest	−0.064	0.03	0.90
Item nonresponse on attitude scale:			
Political efficacy	0.024	0.34	1.26
Ethnocentrism	0.058	0.03	1.28

Two of the four dummies in Table 5 are significantly related to the decision to participate or not. At least one ''no opinion'' answer on the political efficacy scale and at least one ''no opinion'' answer on the ethnocentrism scale results, as expected, in a larger percentage of refusals. It is noteworthy that the contents of those two scales are most strongly related to the topic of the questionnaire. The results of the logistic regression analysis (Table 6) with these two item nonresponse variables show that the effects are still in the expected direction, but the effect of item nonresponse for ''political efficacy'' is no longer significant after controlling for the other variables.

4.4. The joint effect of item nonresponse for difficult questions, threatening questions, and attitude questions

The analyses in the previous sections introduce some variables which are relevant to the prediction of unit nonresponse in the second wave of a panel survey. With regard to the respondent's characteristics, education always had a significant effect ($\alpha = 0.05$), and there was a significant effect of gender and political interest in two of the three analyses. Additionally, some of the identified item nonresponse variables have, as expected, a significant effect: item nonresponse for the difficult questions, item nonresponse for the income question and item nonresponse for the ethnocentrism scale. These three item nonresponse variables and the three respondent background characteristics (gender, education, and political interest) were used in a logistic regression analysis with a stepwise selection procedure. The order of the variables in Table 7 is the same as that in which the variables were entered into the logistic regression equation. In the first step of the selection procedure, the item nonresponse variable for the difficult questions was entered. Subsequently, the procedure selected education, the item nonresponse variable for the income question, and gender. Political interest and the item nonresponse variable for the ethnocentrism scale did not meet the 0.05 significance level for entry into the model. Nevertheless, the results show significant effects of item nonresponse for difficult questions and a threatening question. Also, there is a significant effect both of education, which can be considered as an indication of the respondent's ability to answer questions and gender, which is related to the interest in the topic of the questionnaire.

Using the (nonstandardized) coefficients of the logistic regression presented in Table 7, the highest predicted probability or the highest risk for a refusal equals 0.46. The highest risk group comprises less educated women with item nonresponse for the income question

Table 7. Logistic regression predicting refusal in Wave 2 from gender, education, item nonresponse for difficult questions, item nonresponse for the income question. (results of stepwise selection procedure)

Variable	Standardized estimate	Probability	Odds ratio
Item NR difficult questions	0.088	0.00	1.031
Education	−0.093	0.00	0.658
Item NR income question	0.073	0.00	1.579
Gender	−0.058	0.04	0.810

Table 8. Refusals by number of item nonresponses for five variables with a significant bivariate association with the decision to participate or not

Number of item nonresponses	0	1	2	3+
% refusals	19.1	29.8	28.6	39.3
n	(1,172)	(745)	(306)	(104)

Chi-square = 44.66; $df = 3$, $p < 0.001$.

and the maximum number of item nonresponses for the difficult questions. In the ''opposite group'' (highly educated men with an answer on the income question and with no item nonresponse on the difficult questions), the risk of a refusal is only 0.15 (= lowest predicted probability). This result makes clear that the independent variables can be used to create groups with different chances of refusing an interview.

Another way to evaluate the joint effect of the item nonresponse variables is to create a simple scale for the total number of item nonresponses. This can be done straightforwardly, just by counting the number of item nonresponses for the five variables that have a significant bivariate association with the decision to participate or not (item nonresponse for difficult questions,[9] item nonresponse for the political preference question, item nonresponse for the income question, item nonresponse for the ethnocentrism scale and the political efficacy scale).

The results in Table 8 make clear that the refusal rate increases with an increase in the number of item nonresponses, although this is nonlinear. This confirms our previously formulated hypothesis about the effect of the number of item nonresponses: respondents characterized by a high level of item nonresponses in an interview are more likely to refuse the request of the interviewer to participate in a subsequent interview. The difference between the group with no item nonresponse and the respondents with one item nonresponse is striking and seems to indicate that problems with one question or one part of the questionnaire are enough to increase the likelihood to refuse. This effect of the number of item nonresponses is still significant and strong in a logistic regression with the respondent's characteristics, which were also used in the other analysis (gender, education, political interest) (standardized estimate = 0.12; $p < 0.001$, odds ratio = 1.287). Using the parameters of this logistic regression, the odds (refusal/participation) in the group with three or more item nonresponses are estimated to be 2.13 ($= e^{(3-0)^{*}0.2524}$) times higher than the odds of the respondents with no item nonresponse. This sizeable difference

[9] Six or more ''don't know'' answers were considered as ''an item nonresponse'' for the 18 difficult questions.

between these two groups supports the idea that respondents who experience more difficulties in answering questions are less likely to participate again. The problem seems to be related to the respondents' ability and motivation to answer rather difficult and sensitive questions.

5. Discussion

Research in unit and item nonresponse are two rather different domains of interest for survey methodologists. Different theoretical approaches and conceptual models are used to explain these important aspects of respondent behavior. In theories about unit nonresponse, the interaction between interviewer and respondent is considered to be an important factor. To explain item nonresponse, the cognitive aspects of the answering process are crucial. Nevertheless, unit and item nonresponse also have common characteristics. Both occur during the interaction between interviewer and respondent and both can be considered to be a negative reaction of the respondent to a request or a question from the interviewer. On the basis of these common elements, we have assumed that answering questions during the doorstep interaction is similar to answering questions during the interview. This was a rather productive starting point. The results show that – in the context of a panel survey – several kinds of item nonresponse during the first interview are indeed related to the unit nonresponse of a second interview. Item nonresponse during the first interview can be considered to be an indicator of how respondents react to questions and how they proceed through the answering process. One can assume that the respondents react in the same way to the request to participate in an interview. Noteworthy in this context is the strong effect of the item nonresponse for the income question. This effect suggests that a refusal to the request of the interviewer to participate is not only a matter of being ''too busy'' or ''not interested'' but is for some respondents also a matter of ''too sensitive'' or ''too threatening.'' However, one can also use the number of item nonresponses as an indicator of the smoothness of the interview. A high number of item nonresponses is indicative of more problems in answering the questions and of the respondents experiencing the interview as ''boring,'' ''too threatening,'' ''too difficult,'' or in a word ''unpleasant.'' In the context of a panel survey, the request to participate in the second interview rekindles memories of the first interview. When the first interview was an unpleasant experience (= a lot of item nonresponse), respondents are not inclined to participate again.

In fact, item nonresponse was used as an indicator of two different factors: how respondents react in general to questions or requests and the general atmosphere (pleasant or not) of the interview. With panel data, it is not possible to find out which factor is applicable. Nevertheless, the results stimulate the further integration of research about item nonresponse and unit nonresponse.

The results can have some practical implications and might change the approach to conducting panel surveys. The number of variables used in the analysis to predict unit nonresponse is limited and these variables are easy to measure. This information can be used to inform the interviewers in a panel about how difficult it will be to persuade a respondent to participate again. This pre-tailoring information in combination with an appropriate contact and reaction strategy must improve the response rate in a panel survey. However, more research about the effect of this kind of pre-tailoring information is necessary.

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