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Attitudes Toward Surveys, Attitude Accessibility and the Effect on Respondents' Susceptibility to Nonresponse

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Abstract. This paper analyzes whether respondents' attitudes toward surveys explains their susceptibility to item nonresponse. In contrast to previous studies, the decision to refuse to provide income information, not to answer other questions and the probability of 'don't know' responses is tested separately. Furthermore, the interviewers' overall judgments of response willingness was included as well. Respondents with a positive *and* cognitively accessible attitude toward surveys were expected to adopt a cooperative orientation and were thus deemed more likely to answer difficult as well as sensitive questions. Attitudes were measured with a 16-item instrument and the response latencies were used as an indicator for attitude accessibility. We found that respondents with more favorable evaluations of surveys had lower values on all kinds of nonresponse indicators. Except for the strong effect on the prevalence of don't knows, survey attitudes were increasingly more predictive for all other aspects of nonresponse when these attitude answers were faster and thus cognitively more accessible. This accessibility, and thus how relevant survey attitudes are for nonresponse, was found to increase with the subjects' exposure to surveys in the past.

Keywords: attitude accessibility; attitude towards surveys; don't know responses; item nonresponse; question refusal; response latencies; survey experience

1. Introduction

The extent of nonresponse is an important determinant for the quality of survey data. An extensive number of studies have analyzed those factors relevant for the decision to take part in survey interviews and thus the prevalence of unit nonresponse (for an overview, cf.: Groves et al., 2002). Much less research has been done about when and why respondents fail to answer particular survey questions. Some socioeconomic characteristics, such as for instance the respondents' sex, age and education, were found to be correlates of item nonresponse (Pickery and Loosveldt, 1998; Singer et al., 2000). Other studies have shown reduced nonresponse when subjects received prepaid incentives to encourage interview participation (Davern et al., 2003), when the questions were asked at a earlier stage in the questionnaire (Dickinson and Kirzner, 1985) and when less differentiated response scales were used (Leigh and Martin, 1987). A common practice in these studies is to code the two main manifestations of nonresponse, these are refusals to answer questions and don't knows, into the same category.[1] This assumes that both reactions to the question stimulus can be treated as equivalent and explained in the same way.

In contrast, it has been argued that question refusal and 'don't know' responses have different determinants and should therefore be analyzed separately (Shoemaker et al., 2002). Accordingly, respondents answer 'don't know' dependent upon the perceived *difficulty* of the questions and refuse to answer when their *sensitivity* to a topic exceeds a certain threshold. One could argue that although the two relevant question characteristics are different, both increase the emotional, social or cognitive effort necessary to answer a question and this require more motivation on the part of the respondents. Whether respondents are sufficiently inclined to overcome the motivation to refuse to answer sensitive questions and to spend enough time and effort answering difficult questions may be determined by their evaluation of survey research in general. Thus respondents with positive attitudes toward surveys are willing to accept the emotional, social and cognitive burden when asked to talk about taboo topics, to reveal socially undesirable traits or to undertake an intensive memory search. Some evidence for this hypothesis has been found in research about the determinants of other dimensions of respondents' cooperation in surveys. Subjects with a more favorable survey attitude were found to be more easily convinced to participate in surveys, showed more compliance with instructions on how to complete a mail questionnaire and were less susceptible to social desirability bias (Erbslöh and Koch, 1988; Jones, 1979; Rogelberg et al., 2001; Stinchcombe et al., 1981; Stocké, 2004). A few studies have analyzed whether respondents' evaluation of surveys predicts their disposition to item nonresponse. The study by Singer

et al. (1998) has shown that respondents' values on an index of item nonresponse increased significantly when surveys were judged to be less useful or the participation in survey interviews was perceived to be a waste of time. Similar results were found in two other studies (Rogelberg et al., 2001; Sharp, 1981). However, in all available studies where the effect of attitudes toward surveys has been analyzed, refusals and 'don't know' responses have been aggregated into a single indicator for nonresponse. It is thus unclear whether the evaluation of surveys in general determines the probability of refusals, how prone subjects are to don't knows or both aspects of item nonresponse.

The interviewer in survey research has the important function of supporting and motivating the respondents during the interview. This includes, on the one hand, probing the respondents when they spontaneously refuse to answer questions and, on the other hand, helping to resolve problems in understanding the questions as well as encouraging subjects to undertake a more intensive memory search in the case of 'don't know' responses. To the degree these interventions are successful, the number of questions finally left unanswered is not an inclusive measure of how prone a particular respondent is to nonresponse. Subjects who need extra motivation in order to provide the requested information belong to the group of marginal responders and may equally well decide not to answer questions due to rather subtle factors. A comprehensive analysis of nonresponse should thus include a measure of how 'critical' a certain respondent is in this respect. When attitude toward surveys does indeed determine the susceptibility to nonresponse, these attitudes should not only predict the extent of failures to answer, but also how difficult it was in general to administer the questions. We are not aware of any empirical test of this hypothesis.

By no means do generalized attitudes always predict behavior. It has been found that the degree of attitude-behavior critically depends on how strong attitudes are (cf. Petty and Krosnick, 1995 for an overview). The cognitive accessibility of attitudes, as one among conceptually similar but differently operationalized indicators for the strength of attitudes, has proved able in many studies to predict how strongly attitudes guide behavior: the less time subjects needed to form an attitude answer the more this answer predicts behavior (Bassili and Bors, 1997; Fazio and Williams, 1986; Fletcher, 2000; Kokkinaki and Lunt, 1997). Furthermore, direct experience with the relevant attitude object has been identified as an important antecedent condition for the strength and accessibility of attitudes (Doll and Ajzen, 1992; Kraus, 1995). These results suggest *firstly* that cognitively more accessible attitudes toward surveys are stronger determinants for item non-

response. *Secondly*, the subjects' amount of survey experience in the past should increase the cognitive accessibility of their survey attitude and thus make these attitudes more influential for nonresponse. These hypotheses have not yet been addressed in empirical research.

In the present study we tested how the respondents' attitudes toward surveys affects the probability of different kinds of item nonresponse. In this analysis we differentiated between the refusal to provide income information and to answer other questions as well as how prone subjects are to answer 'don't know' and how difficult it was in general to obtain answers from each respondent. We tested furthermore the hypothesis that the effect of attitudes toward surveys on each of the nonresponse outcomes depends on the accessibility of these attitudes and that the degree of attitude accessibility is a function of prior experience with survey research.

2. Theoretical framework

In the item nonresponse theory proposed by Beatty and Hermann (2002), the respondents' decision to answer a survey question is assumed to depend on factors which can be divided into three groups. These are *firstly* cognitive determinants for how much effort is necessary to answer a question. One important determinant which affects the difficulty of questions is how cognitively accessible the requested information is, i.e. how available to the respondent's memory. These cognitive states can be conceptualized as a continuum, ranging between perfect availability and information being completely inestimable (Beatty and Herrmann, 2002). In the case of perfect availability the cognitive costs for memory search is very low, increases when information is less available and is prohibitively high for inestimable information. Cognitive costs for answering survey questions are furthermore affected by the clarity of question wording, the sophistication of response options and the complexity of the question topic: the more effort subjects need to understand the question, the more sophisticated the requested information and the more unfamiliar respondents are with the question topic, the more effort is necessary to answer a question (Beatty and Herrmann, 2002). An index of these costs represents the motivation behind 'don't know' responses. When the cognitive demand to provide a substantial answer exceeds the subject's motivation, a 'don't know' response is the most obvious satisficing strategy (Krosnick, 1991).

The *second* group of factors Beatty and Herrmann (2002) included, partly in their theoretical construct 'Communicative Intent", are those which determine the sensitivity of questions. Sensitivity refers *firstly* to social norms that define it to be inappropriate to talk about particular topics

outside of private contexts. Sexual behavior or income-related issues are examples of such topics (Shoemaker et al., 2002). Questions are *secondly* classed sensitive when the respondents' true scores do not conform to those regarded as socially desirable in society. In order to avoid the embarrassment of either answering in a socially desirable way and thus dishonestly or creating a negative impression in the eyes of others, respondents may simply decide not to answer the particular question (Shoemaker et al., 2002). Both determinants of sensitivity together constitute the psychological and social costs necessary to answer questions and thus determine the respondents' motivation for refusing to answer questions.

All respondents who agreed to take part in a survey interview are in principle willing to answer questions and to a certain degree motivated to accept the costs for doing so. Factors affecting the strength of this motivation are the third determinant of nonresponse. The motivation for answering questions may vary according to the respondents' interest in the question topic or the perceived legitimacy of the aim of the actual survey (Beatty and Herrmann, 2002). The difference in the value of these factors, and the cognitive costs of answering a particular question on the one hand and the emotional/social costs on the other, determines the probability of don't knows and question refusals.

Apart from the determinants mentioned in the previous section, which are related to the special features of an interview situation or particular questions, the respondents' attitudes toward surveys in general may exert an important influence on how much of a burden they are willing to accept in answering questions. Different respondents may believe to a varying degree that surveys serve their own interest or that survey results are valuable for society. Such generalized attitudes are schematically organized evaluations and are applied in all situations that are recognized as survey interviews. Research from cognitive psychology has shown that they are initially activated automatically, often predominates more deliberative evaluations and may guide behavior in accordance with the attitude content (Bargh, 1997). However, the precise conditions under which a high degree of attitude-behavior consistency can be expected have been the subject of a controversial debate (cf. Six and Eckes, 1996). An answer to this question and a hypothesis about when attitudes toward surveys determine the effort respondents are willing to make in order to answer sensitive or difficult questions was proposed in the Frame-Selection Model (Esser, 2001: 259 ff.). This theory is a generalization of Fazio's MODE-Model from the field of attitude research (Fazio, 1990).

In the Frame-Selection Model (FSM) the accessibility of attitudes on the one hand and the elaboration of subjects' information processing on the other are the two decisive determinants of attitude-behavior consistency. The first and most important precondition for attitudes toward surveys in determining the probability of nonresponse is that these attitudes are strong, thus cognitively easily accessible and spontaneously activated in a survey interview. Since surveys cannot be assumed to be a salient and involving attitude object, this cannot be taken for granted for all survey participants. When the attitudes toward surveys are not strong enough to guide the decision to answer or not to answer survey questions, respondents potentially rely on the criteria predicted in Beatty and Hermann's item nonresponse theory. Whether such a reflected way of response selection can be expected depends however on whether respondents have sufficient motivation *and* cognitive resources at their disposal. If that is so, the pros and cons for answering or not answering a question are analyzed in each single case. Since the behavior in survey contexts normally does not bring about serious consequences, the motivation for deliberate judgments can be expected to be rather low. When therefore neither the attitudes nor a reflected way of response selection guides respondents' behavior, they utilize simple heuristics based on easily available evaluation aspects when they decide to answer difficult or sensitive questions.

Respondents with a positive and at the same time cognitively highly accessible attitude toward surveys are expected to frame a particular survey interview in such a way that they regard the support of this survey to be the paramount goal. Accordingly, neither cognitive nor psychological or social costs will prevent the subjects from answering the questions. It is thus predicted that an increasingly positive evaluation of surveys will reduce 'question refusal' and 'don't knows' responses when these attitudes are cognitively highly accessible.

Direct experience with the respective attitude object has been found in other fields of research to be an important factor determining the strength of attitudes (Jaccard et al., 1995). Apart from consuming survey results, participation in survey interviews is the typical way subjects come into contact with surveys. We thus expect that the accessibility of attitudes towards surveys increases with the subjects' experience with surveys in the past.

3. Results from Previous Research

3.1 FACTORS FOUND TO EXPLAIN NONRESPONSE

Researchers have tested whether the characteristics of the respondents, the features inherent to the questionnaire instrument and the interview situation itself affect the decision to answer questions (for a comprehensive review of this research cf. de Leeuw et al., 2003). In many of these studies compound indexes of the prevalence of 'don't know' and 'refusals to answer' responses to questions were analyzed. In an early study with data from a mail survey about buying plans and reading preferences, females, older respondents and subjects with less formal education were found to be more susceptible to item nonresponse compared with their respective complementary groups (Ferber, 1966). These results were confirmed with data from a telephone survey, the Survey of Consumer Attitudes, where an index of nonresponse has been analyzed (Singer et al., 2000). Furthermore, in this study nonresponse was found to increase with decreasing income of the respondents. One could argue that increasing age and less education may be associated with more cognitive effort being expended in answering the questions.

Researchers have tested the effect of different features of the questionnaire instrument and of the survey design on the proportion of questions left unanswered. One study with a mail survey found that the prevalence of nonresponse increases for items later in the questionnaire, maybe because the respondents are already more fatigued and answering questions was getting to be more burdensome (Dickinson and Kirzner, 1985). This effect was not replicated in another study (Ferber, 1966). In this study it was however found that items that required more thought, and which were thus judged to be more difficult, had a higher probability of not being answered (Ferber, 1966). Data from a telephone survey about attitudes toward financial institutions found higher nonresponse rates for cognitively more demanding 11 point response scales than in those cases where respondents only had to differentiate between 5 answer categories (Leigh and Martin, 1987).

Data from presidential election studies has been tested as to whether the respondents' political involvement and their self-perceived political efficiency predicts the probability of insubstantial answers to questions about political issues (Francis and Busch, 1975). Both factors can be assumed to increase the cognitive availability of political opinions and were indeed found to reduce nonresponse. In a study by Copas and Farewell (1998) the failure to answer questions about sexual behavior and socioeconomic characteristics was found to be a function of how embarrassing

respondents found the questions. A random half of respondents from the Detroit Area Study received a prepaid incentive, in the form of a gift-boxed ballpoint pen for their interview participation. What was tested was whether the motivation of these respondents to answer questions was higher than that of respondents who received no incentives (Willimack et al., 1995). It was found that respondents in the incentive condition provided significantly more complete answers to open ended questions in the interview. The same result was found regarding the effects of a cash incentive on an index of item nonresponse in another study (Singer et al., 2000); but was not replicated in research where 10 or even 20 dollars were given prepaid to the respondents (Davern et al., 2003).

In studies where the special kinds of item nonresponse were analyzed separately, it was found that explicitly offering a ‘don’t know’ option increases the proportion of such answers (Schuman and Presser, 1980). Here, respondents were asked whether they favor or oppose the largely unknown ‘Agricultural Trade Act of 1978’. When the ‘don’t know’ option was included, 90 percent, compared to an otherwise 69.2 percent, gave this answer. Similar results were found with data from the National Mortality Followback Survey (Poe et al., 1988). In another study the prevalence of ‘no opinion’ answers was found to increase with the complexity of the wording of the questions, as measured with the Flesch ‘ease of reading’ formula (Converse, 1976). The use of long preambles, the request for projections into the future and the provision of more than dichotomous response options increased the number of subjects answering that they had no opinion at all. The probability of ‘don’t know’ answers was found to increase substantially more with reduced education when the questions were difficult rather than easy (Smith, 1982). The probability of ‘no opinion’ answers on 15 ethnocentrism items was found to be higher for females, as well as for older and less well-educated subjects (Pickery and Loosveldt, 1998). Although the number of unanswered questions differed considerably between the interviewers, neither their own socioeconomic characteristics, nor their own probability of ‘no opinion’ answers, nor their interview experience, explained these differences.

Two studies have tested the determinants for varying kinds of nonresponse with the same survey data. In a recent study with data from the ‘Cultural Shifts in Flanderns: Survey 2000”, the prevalence of income item nonresponse, ‘don’t know’ answers to knowledge questions, ‘no opinion’ responses to attitude questions and ‘don’t know’ responses to questions about subjective beliefs have been analyzed (Pickery and Loosveldt, 2004). The probability of income nonresponse was found to decrease with the increasing age and education of respondents, with the

probability proving to be greater for woman than for men. This was the case for ‘no opinion’ answers and both types of ‘don’t know’ responses as well, but age had to some extent the reverse effect. The second study, by Shoemaker et al. (2002), used item characteristics from the US General Social Survey and the South American Latinobarometer in order to analyze the reasons for ‘don't know’ and ‘question refusal’ responses. The sensitivity and difficulty of each question was evaluated by experts. A strong correlation was found between the difficulty and the prevalence of ‘don’t knows’. The sensitivity factor predicted, though much more weakly, the probability of ‘question refusal’ for a particular item. Unexpectedly, the prevalence of refusing to answer was positively related to the difficulty of the item and fewer ‘don’t knows’ were found with more sensitive questions.

In addition the question about the respondents’ income also typically receives a high amount of nonresponse; the reason for this is not well understood. An analysis of income nonresponse in the U.S. census from 1980 has shown that self-employed and high-status occupations, such as doctors, dentists and lawyers, have a particularly high probability of not reporting their income (Lillard et al., 1986). According to another analysis, using data from a telephone survey of users of public health facilities, female, older and less well-educated respondents were more likely not to provide exact numerical income information (Bell, 1984). Wagner and Motel (1996) found with their sample of the elderly that males and respondents with limited cognitive capacities were more likely to answer the question about their personal income whereas household income was more likely to be provided by males, by younger respondents and when no third person was present during the interview. The socioeconomic characteristics of respondents who refused to answer the income question and those who answered that they did not know their income differed substantially (Schräpler, 2002; Smith, 1991). Respondents who answered ‘don’t know’ were more likely to come from households with more than one earner than those who refused and were less likely to be the main breadwinner. Furthermore, respondents who answered ‘don’t know’ were less well-educated, had less prestigious jobs and were more likely to be female than those who refused to answer the income question. It should also be noted that respondents who were not taking part in the next wave of the Socioeconomic Panel were more likely to refuse to answer the income question in the actual survey (Schräpler, 2002). This association was not found for respondents who answered ‘don’t know’, suggesting that item and unit nonresponse may in part have common determinants.

3.2 EVIDENCE FOR THE ROLE OF ATTITUDES TOWARD SURVEYS

Empirical evidence suggests that attitudes toward surveys predict different aspects of a respondent's cooperation in survey contexts. It has been found *firstly* that respondents with a positive attitude are more likely to agree with a request to participate in a survey. The attitudes toward surveys of respondents who first refused to participate but were then convinced to take part in the survey interview were found to be less positive compared with those who spontaneously agreed to participate; they believed less that surveys provide useful information about people's political preferences, that they are an important basis for public-sector planning and agreed more that surveys often contain issues which are not really anybody else's business (Erbslöh and Koch, 1988). In a similar study, converted non-responders reported stronger doubts about the reliability of survey results and were more likely to agree that they had been asked too often in the past to participate in surveys (Stinchcombe et al., 1981). Furthermore, respondents with a positive attitude toward surveys reported more survey participation in the past (Goyder, 1986; Jones, 1979). Subjects who judged surveys to be valuable and survey participation to be an enjoyable experience were found to be more willing to participate in future survey interviews (Rogelberg et al., 2001).

Other research has proved that respondents with a positive evaluation of surveys follow the questionnaire instructions more closely in a mail survey than subjects with a more negative attitude. They marked more than one response option less often and failed less often to give open-ended reasons for the answer selected (Rogelberg et al., 2001). In the same study, a positive evaluation of surveys was associated with a significantly faster return of the completed questionnaire. Stocké (2004) found that respondents with more positive attitudes toward surveys were less susceptible to social desirability bias when asked about their racial attitudes. Incentives based on social desirability were operationalized using an index consisting of an indicator of the subjects' need for social approval, their desirability beliefs about the response options and differences in the level of privacy between the interview situations. Results have shown that the sensitivity of respondents' answers to these incentives based on social desirability decreased significantly when surveys were judged to be increasingly positive.

Only a few studies tested the role of attitudes toward surveys for the respondents' susceptibility to item nonresponse. In a recent study about the consequences of attitudes toward surveys, 60 customers of a financial institution were asked 3 open-ended and 78 close-ended questions in a mail survey (Rogelberg et al., 2001). For both types of questions an index of the proportion of missing answers was computed. Two attitude scales, each consisting of three items, were used to

measure the attitude toward surveys: the perceived value of surveys and the enjoyment which was expected in the case of survey participation. The results proved that more positive attitudes on both dimensions reduced nonresponse in the case of open-ended questions. In the case of close-ended questions only the estimated worth of surveys was relevant for nonresponse. The study by Singer et al. (1998) tested whether the respondents' values on a nonresponse index, including 'don't know' and 'refusal' responses, could be predicted by their attitudes towards surveys. It was found that 2 out of the 3 analyzed items intended to measure attitudes towards surveys significantly affected the probability of nonresponse: respondents' failed to answer less questions when they regarded surveys to be more useful and perceived survey participation to be less of a waste of time. In a replication study, only the first attitude item was found to have a significant effect on the outcome variable.

3.3 Attitude accessibility and attitude-behavior consistency

The degree of attitude accessibility, one among many different sub-dimensions of attitude strength, has proved to be an important predictor for how strongly attitudes guide behavior. Attitudes which are cognitively highly accessible, as measured by the time necessary to derive the necessary evaluations from memory, have been found to be more predictive for the behavior towards the respective attitude object. For example, attitudes towards political candidates have been found to be strongly related to the subjects' voting behavior when these attitude answers were fast rather than slow (Bassili, 1993, 1995; Bassili and Bors, 1997; Fazio and Williams, 1986; Fletcher, 2000). In the area of consumer research, response latencies were found to indicate to what extent product evaluations predict intentions to consume these products; in other words, the attitude-behavior consistency increases with the accessibility of the evaluations (Kokkinaki and Lunt, 1997). Similar results were found in an experimental study where subjects evaluated candies by pressing either a 'like' or 'dislike' button. The time needed for these evaluations was recorded (Fazio et al., 1989). The correlation between these evaluations and the kind of candies chosen at the end of the experiment was found to increase substantially with the response speed.

The role of response latencies for how predictive attitudes towards surveys are for the respondent's cooperation in the interview context has been analyzed in one study. In the above-mentioned research about how prone subjects are to social desirability effects, the time necessary to answer each of the 16 questions about the evaluation of surveys in general was recorded

(Stocké, 2004). It has been found that these response latencies predicted significantly to what degree a positive attitude toward surveys reduced social desirability effects: fast and favorable evaluations reduced the susceptibility to social desirability bias, whereas positive but slow, and thus less accessible attitudes, proved to be irrelevant.

4. Empirical Study

4.1. Data Collection and participants

The respondents in this study were a multi-stage, local random probability sample of residents from a metropolitan area in Germany (about 300.000 inhabitants). Households were listed using a random walk procedure and respondents then selected using the 'last-birthday' method. The 139 computer-assisted interviews took place in the respondents' homes and the questionnaire was altogether 138 questions long. The interview consisted firstly of 57 questions about the respondents' attitudes toward surveys and about different aspects of their past survey experience. This part was asked at the very beginning of the interview in order to avoid these reports being influenced by the evaluation of the actual interview. The remaining part of the questionnaire was 81 questions long and covered a variety of different topics, which are described in the following section. The response rate was 40.4 percent.

4.2. Measures

The following section describes how the four indicators for the respondents' susceptibility to item nonresponse have been constructed. Furthermore, the operationalization of those factors assumed to explain nonresponse is described. These are the respondents' attitudes toward surveys, the accessibility of these attitudes and the respondents' survey experience.

- *Generalized attitudes towards surveys:* Starting with 31 likert type attitude items adopted from other studies, we constructed a 16-item instrument for measuring attitudes toward surveys (for information about item selection cf. Stocké and Langfeldt, 2004). The attitude items measured the perceived value of surveys, the trust in the validity of survey results and the expected time and effort required to participate in survey interviews (cf. the item wording in table 1 below). The respondents indicated on a seven-point response scale how strongly they agree or disagree with each of the items. Responses on negatively worded items were recoded in such a way

that for all items high scores express positive attitudes toward surveys. The internal consistency of the resulting scale, as indicated by a Chronbach's alpha of .73, was not very high but can be regarded as sufficient. For each respondent we computed an average attitude score which varies between 1 (negative attitude toward surveys) and 7 (positive attitude toward surveys).

- *Cognitive accessibility of attitudes toward surveys:* The time subjects needed to answer the questions about their attitudes toward surveys was used as an indicator for the cognitive accessibility of these attitudes. Response times were recorded together with the attitude responses during the computer-assisted interviews. After the interviewers finished reading the question from the computer screen, they switched on the time measurement and switched it off immediately after the respondents answered the question. Once the answer was entered into the laptop computer, the interviewer judged whether the time recorded represented exactly the time that was necessary to answer the question. This was not the case when the respondents asked clarifying questions, had to be prompted further in order to give an appropriate answer or when subjects were distracted by external factors. Under all these conditions the recorded time included components not belonging to the response generating process in a narrow sense. Thus, 7 percent of response latencies for all attitude answers had to be coded as invalid. Since these missing values cannot be assumed to vary completely at random, the invalid response times have been imputed with the sample mean of the respective question. The technical precision of response latency measurement was one-hundredth of a second. All response latencies were measured without the subjects' awareness in order not to influence their response speed.

- *Amount of survey experience:* As an indicator for the amount of direct experience with the attitude object 'surveys', respondents were initially asked whether they had participated in a survey before. If the answer to this question was positive, then the total number of survey interviews they had taken part was recorded. The answers to both questions was combined into an index of total survey experience. This index ranged between 0 and 20 survey interviews which had been completed in the past.

- *Respondents' susceptibility to question refusals:* The interviewer assigned a special code to each question in the questionnaire when the respondent indicated that he or she was definitely not willing to answer a particular question or when a 'don't know' answer was given. For refusals to answer questions we created two indicators. For many survey researchers it is important to obtain information about the financial situation of the interviewee, but income-related questions typically receive very high proportions of 'refusal' responses. Thus, whether the respondents pro-

vided information about their household income was included in our analysis as a first outcome variable. All respondents were initially asked about their exact household income and if this question was not answered, then they were asked whether they were at least willing or able to select between 22 income categories.[2] These categories were presented on show cards to the respondents. The respondents were classified into those who answered the income question, although probably only in the form of an income category, and subjects who refused to provide any income information. The *second* indicator for susceptibility to 'refusal' response was the percentage of the 80 other questions in questionnaire that each respondent refused to answer. In this measure we did not include the attitudes toward survey items and the questions about survey experience. Since none of the respondents refused to answer even one of these questions, this decision did not affect the measuring of the prevalence of refusals. The questions included in the measure were about a wide variety of attitudes, beliefs and facts.[3] The theoretical range of this measure is between 0 (no questions refused) and 100 (refused to answer all the questions).

- *Probability of 'don't knows':* For each respondent we computed the proportion of those questions where a 'don't know' or 'no opinion' answer was given. The questions used to calculate this measure were the same as those used in the case of the refusal indicator. However, since only three respondents answered 'don't know' in the case of the income question, it was not possible to analyze this type of nonresponse for the income question separately. These insubstantial answers were thus included in the general measure for the prevalence of 'don't knows', which were thus based on altogether 81 questions. This measure can range between 0 (no 'don't knows') and 100 (all questions answered with 'don't know').

- *Respondents' overall willingness to answer questions:* Interviewer judgements were used in order to obtain an overall indicator for how difficult it was to obtain answers from a certain respondent. At the end of each interview the interviewers judged how willing they found the respective respondent to answer the questions during the whole interview. The response options were 'good', 'fair', 'bad', 'first good, then bad' and 'first bad, then good'. We assumed that responses on this item reflected the interviewers' overall judgment about the effort which was necessary to obtain the answers, how reluctant the respondents were to provide the requested information and the prevalence of unavoidable 'refusal' responses. These responses from the interviewer were used to divide respondents into subjects with perfect response willingness (response category 'good') and respondents who were judged to be less willing to answer the questions (all other responses).

5. Analysis and Results

5.1. DESCRIPTION OF VARIABLES

The overall attitudes towards surveys in our sample proved to be positive (cf. table 1). Except for one item, the average evaluation of surveys is above the midpoint of the response scale and therefore in the positive attitude domain. With an average attitude score of 5.4, surveys were most favorably evaluated with respect to their value for the core subsystems in society, i.e. the economy, politics and science (item 1). The most critical attitude toward surveys was found with respect to the burden caused by questionnaires being too long and thus this aspect of surveys only received an average attitude score of 3.9 (item 15). Although the decision to participate in a survey interview presupposes to a certain degree a positive attitude toward surveys (Erbslöh and Koch, 1988), we observed in our sample a substantial degree of heterogeneity on this dimension. The mean responses on all attitude items varied between a relatively negative value of 2.8 and a very positive attitude score of 6.8.[4] According to the time which was on average necessary to answer the attitude questions, they differed considerably with respect to the accessibility of the respective special aspect under evaluation. The item where we found the most positive evaluations, the value of surveys for different spheres in society (item 1), took only 3.0 seconds to answer. With 6.3 seconds, it took the respondents more than double as long to judge whether in surveys there are questions about issues which are nobody else's business (item 13).

The respondents in our sample were found to have a high degree of experience with survey interviews. A proportion of 66.2 percent had participated in at least one other survey before. Compared with results from a nationwide survey in 2000, where only 45 percent reported having survey experience, respondents with survey experience are over-represented in our sample (Forsa, 2000). On average the respondents with interview experience had taken part in 4.0 surveys in the past and this figure is 2.6 including subjects with no previous survey participation.

-- Table 1 about here --

How strongly the respondents were prone to the different kinds of nonresponse is presented in table 2. In our sample 10.1 percent of subjects refused to provide any information about their household income. This resembles the proportion of 13.2 percent which was on average observed for the nationwide representative sample of the German General Social Survey in the period between 1980 and 2000 (cf. the codebook of this dataset, study number ZA 17, available from the

German Central Archive). Furthermore, we found that a majority of 71.2 percent of the respondents did not refuse to answer any of the 80 other questions included in our analysis and none of the respondents refused to answer more than 4 questions. On average, .52 percent of the questions were left unanswered. Thus, the respondents were about 20 times more likely to refuse to provide income information, compared with the average for all the other topics which were included in the questionnaire. Including the refusals to answer the income question, the mean percentage of refusals increases to .64 percent. With respect to the 'don't know' responses about half of the sample never answered that they did not know the answer or that they did not to have an opinion on a question topic. The maximum number of such responses were 4 and the mean percentage of 'don't knows' on all the 81 questions was .96. Thus, the probability of 'don't know' responses substantially exceeds that of refusals to answer.

-- Table 2 about here --

Table 3 presents the interviewers' overall judgements about each respondent's willingness to answer questions during the entire interview. Altogether 82.7 percent of all respondents' were judged be very willing to provide the requested information, in 12.2 percent of the cases the interviewer said the response willingness was 'fair' and only the performance of 5.1 percent was evaluated to be bad at least during parts of the interview. So, altogether only 17.3 percent of the respondents were judged to be less than perfectly willing to provide the requested information.

-- Table 3 about here --

According to our data the four indicators for nonresponse all correlate positively, though in most cases only weakly (cf. table 4). The strongest and statistically significant association was found between the probability of not answering the income question and the proportion of 'refusal' responses in the case of the other questions ($r=.61$; $p \leq .05$). Thus when a respondent decided not to provide income information, then the probability of refusing to answer other questions was higher as well. A much weaker, and only partly significant association, was found between the respondents' predisposition to 'don't know' answers and the refusal to provide income information on the one hand ($r=.15$; $p > .05$) and the refusal to answer other questions on the other ($r=.23$; $p \leq .05$). This suggests that both forms of nonresponse, although sharing a weak common component, are conceptually different phenomena. Between the interviewers' judgments of response willingness and the other three indicators of nonresponse we found very weak associations that

range between r=.11 and r=.04 (all p > .05). This indicates that the interviewers' judgments are influenced, but absolutely not determined, by all behavioral indicators for nonresponse.

-- Table 4 about here --

5.2. DETERMINANTS OF ATTITUDE ACCESSIBILITY

In this section we tested the hypothesis that attitudes toward surveys are cognitively more accessible when they are based on direct experience with survey interviews. Thus it was expected that respondents who already took part in survey interviews in the past were able to formulate their attitude answers faster than novice respondents. We however did not have clear predictions about whether having survey experience at all or the amount of this experience is the more relevant determinant. The dependent variable in the regression models presented in table 5 was the average response time which was necessary to answer the 16 attitude items. In this analysis we control for different socioeconomic characteristics, which are likely to be confounded with the amount of survey experience. These variables, the respondents' age, sex, income and their formal education, are included in regression model 1. Among the characteristics analyzed, only the respondents' age proved to have a significant effect on the response latencies: with increasing age it took the respondents longer to answer the attitude questions. It has been shown in research about the consequences of cognitive aging that older people have less working memory at their disposal, which reduces their speed when processing the question stimuli (Park, 1999). *Secondly*, in model 2, we included a linear term for the number of subjects' past survey interviews into the regression equation. As expected, the amount of experience with surveys proved to be a significant determinant of the degree of attitude accessibility: with each survey the respondents had participated in the past they needed on average .18 seconds less to answer the questions about their evaluation of surveys. The *third* result of our analysis was that attitude accessibility depends more on whether or not subjects had survey experience than on the amount of this experience. When a dummy variable, which indicates the presence of survey experience, was entered into the analysis in regression model 3, this factor proved to be a significant predictor for the response times: on average respondents with survey experience answered the items about their attitudes toward surveys 1.45 seconds faster that those who participated for the first time in a survey interview. When this factor was controlled, the explanatory power of the continuous indicator for survey experience vanished.

-- Table 5 about here --

5.3. Effect of attitudes toward surveys and their accessibility on subjects' Susceptibility to Nonresponse

In the following part of the analysis we tested the main hypotheses of this article. We predicted that the respondents' attitudes toward surveys determine how much burden respondents are willing to accept when answering difficult or sensitive questions. Thus respondents with more positive attitudes are expected to have lower values on all analyzed indicators for nonresponse. It is furthermore expected that the attitude accessibility and thus the time respondents' needed for their attitude answers mediates this relationship: faster responses should be more predictive for nonresponse. This hypothesis implies a 'response latencies by attitude answers interaction' effect to explain the prevalence of nonresponse.

In a first series of regression analyses, we tested whether the attitude responses alone predict the extent to which respondents did not answer questions in the survey (cf. table 6). Since the outcome variables for the number of 'don't know' and 'refusal' responses are count variables, negative binomial regression analyses were used in both cases.[5] The results from these analyses have shown that the prevalence of both kinds of nonresponse is less pronounced for respondents with a positive rather than negative attitude towards surveys (cf. regression models 4 and 5). However, the effect of the survey attitude alone proved to be statistically significant only in the case of 'don't knows' (likelihood ratio test chi^2 (df=1): 4.9, $p \leq .05$ ('don't know'); 3.7, $p > .05$ (refusals)). With the results of logistic regression model 6, we tested whether attitudes toward surveys predicts the probability that respondents refused to provide information about their household income. The negative regression parameter also indicates a reduced refusal probability with more positive attitudes, though this effect proved not to be statistically significant (likelihood ratio test chi^2 (df=1): 0.9, $p > .05$). With regression model 7 we tested to what degree the interviewers' judgments about response willingness was determined by the respondents' attitudes toward surveys. Since each of the 12 interviewers evaluated between 1 and 21 of the respondents, these judgements cannot be regarded as independent observations. In order to correct for this design effect, we used the Stata module xtlogit in order to compute a simple multilevel fixed effects model with random intercepts for the interviewer on the second level for this analysis (Snijders and Bosker, 1999). The results indicated *firstly* that the between interviewer differences in the evaluations was responsible for 38 percent of the variance in the evaluations on the level of the respondents (likelihood ratio test chi^2: 12.1; $p \leq .05$). In controlling for this clustering of the

evaluations within the interviewers, attitudes toward surveys alone did not predict the respondents' willingness to answer questions (likelihood ratio test chi^2 (df=1): 3.2, $p > .05$).

-- Table 6 about here --

Except for the prevalence of 'don't know' responses, the respondents' evaluation of surveys alone was not a significant determinant for the different indicators of nonresponse. With regard to the regression analysis presented in table 7, what was tested was whether the attitude answers in combination with their cognitive accessibility, as measured by response latencies, predict the nonresponse indicators. In the negative binomial regression model 8, the prevalence of 'don't know' answers was regressed on a multiplicative term between the content and accessibility of the respondents' attitudes. The positive interaction parameter indicates that the reduction of the nonresponse probability with more positive attitudes is weaker when the respondents needed more time to form their respective attitude judgments. This effect did not attain statistical significance (likelihood ratio test chi^2 (df=1): 0.3, $p > .05$). However, this was the case for all the other indicators of the respondents' predisposition to item nonresponse (cf. the regression models 9 to 11, presented in table 7). The effect of attitudes toward surveys on the probability of not providing income information, of refusing to answer other questions and not being judged perfectly willing to answer questions in general was significantly mediated by the response latencies (likelihood ratio test chi^2 (df=1): 7.0, $p \leq .05$ (refusals); 3.8, $p \leq .05$ (income refusal); 6.7, $p \leq .05$ (response willingness)).

-- Table 7 about here --

In order to allow an easy interpretation of the observed interaction effects, we computed predicted values for each combination of positive/negative attitudes toward surveys and high/low attitude accessibility (cf. table 8). This has been done in the first part of table 8 for the percentage of questions, except the income question, the respondents did not answer in the entire interview. We found that respondents with a relatively positive and at the same time accessible attitude toward surveys refused to answer by far the lowest proportion of questions, i.e. 0.13 percent. In contrast, an accessible and negative attitude leads subjects to a refusal rate of 0.68 percent. Thus, under the condition of high cognitive accessibility, we found that subjects' predisposition not to answer questions varies 0.55 percentage points when attitudes toward surveys were either positive or negative. Under the condition of low accessibility there is only a slight effect of 0.09 percentage points in the opposite direction.

The results for the probability of not providing any information about the own household income were very similar. Here, for respondents with fast and relatively negative attitude responses the percentage of refusals is 16.7 percent and this proportion drops in the case of positive attitudes to a proportion of 3.7 percent. This represents a reduction in the refusal rate of 13.0 percentage points. For subjects with low attitude accessibility, the prevalence of refusals is not much affected by their evaluation of surveys. Here again, there is only a slight tendency of 4.0 percentage points that subjects with a positive attitude toward surveys will more often not provide the requested information.

In the case of our third and conceptually different indicator for the respondents' predisposition to nonresponse, the results found for the other two indicators are perfectly replicated. Accordingly, only 0.8 percent of respondents with fast and relatively positive attitude toward surveys, but 10.6 percent of those with a cognitively highly accessible negative attitude were judged by the interviewer to be less than perfectly willing to answer the questions. This is a 9.8 percentage points reduction in the probability of falling into the category of 'difficult' respondents. However the attitude answers of respondents who needed a relatively long time to evaluate surveys in general, almost made no difference at all to how their response willingness was judged: only 1.6 percentage points more subjects with a positive rather then a negative attitude were judged not to be perfectly willing to answer the questions.

-- Table 8 about here --

6. Summary and conclusion

The aim of this study was to test the hypothesis that respondents' generalized attitudes toward surveys are an important determinant for their predisposition to leave more rather than fewer survey questions unanswered. In contrast to previous research, we differentiated between the probability of 'don't knows', the prevalence of refusals to provide income information and to answer other questions, as well as the interviewers' overall judgments of subjects' response willingness. This takes the insight from other research into account that different kinds of item nonresponse are likely to be differently motivated. We argued that the decision not to answer questions is the consequence when the burden for doing so exceeds the respondents motivation. Also, because this burden may be emotional, social or cognitive in nature, it was predicted that respondents with a positive and cognitively highly accessible attitude toward surveys frame a survey interview in such a way that their dominant goal will be to support the success of this endeavor: under

this condition the respondents' sensitivity to incentives for nonresponse, from whatever source, is expected to be neutralized or at least greatly reduced. This prediction was obtained from Frame-Selection Theory and Fazio's MODE-Model (Esser, 2001: 259 ff.; Fazio, 1990).

The empirical results provided strong support for the hypothesized role of attitudes toward surveys. The prevalence of each of the analyzed forms of nonresponse and how unwilling subjects in general have been judged by the interviewers to answer questions was found to be substantially reduced when the respondents had a more favorable evaluation of surveys. In the first stage of our analysis we found, for three out of the four analyzed indicators, that attitudes *alone* were not a statistically significant predictor for nonresponse. However, as theoretically expected, this was the case when the response latencies and thus the accessibility of the attitude answers were additionally taken into account: the attitudes towards surveys were increasingly able to diagnose how susceptible respondents were to nonresponse the faster these were able to form such evaluations. The only nonresponse indicator where the response latencies proved to be irrelevant was the probability of 'don't know' responses, where the attitude answers alone already explained the prevalence of nonresponse. As an explanation for this partly unexpected result one could suspect that the time and effort factor which causes 'don't know' responses is not as severe as that which causes question refusals. Thus, in the case of refusals of questions, the average attitude accessibility in the sample may not be sufficient to bring about a significant effect, but probably is enough to explain the 'don't know' responses. Taking the respondents' heterogeneity with respect to their attitude accessibility into account, then adds predictive power in the former but not the latter case.

Thus, according to our results, attitudes toward surveys are a truly general determinant for item nonresponse. In other studies, the complexity of the question wording was found to be relevant for 'don't knows' (Converse, 1976) and the respondents' occupational status explained the probability of refusals to answer the income question (Lillard et al., 1986). In our study the evaluation of surveys in general proved to predict all kinds of nonresponse and even the interviewers' judgment about how difficult it was to obtain answers. Thus, attitudes toward surveys predicted aspects of nonresponse between which, in most cases, either weak or no correlations have been found. Survey attitudes were found in other research to explain to what extent respondents refrain from socially desirable response behavior or how accurately they followed mail survey instructions (Rogelberg et al., 2001; Stocké, 2004). One could therefore surmise that this construct captures a general predisposition to cooperate more or less fully in a survey context.

In addition to the consequences of accessibility differences in attitudes toward surveys, we furthermore analyzed the preconditions for this factor. Other research has shown that the respondents' experience with survey interviews in the past influences the content of their present attitudes toward surveys (Schleifer, 1986; Sheets et al., 1974). In particular, subjects were found to have more negative evaluations of surveys when they judged their last interview to be too long and the required time and effort for completing the questionnaire as too much (Stocké and Langfeldt, 2004). In the present study we found that not only the *quality* of survey experience affects the content of attitudes toward surveys, but that the *quantity* of these experiences increases their cognitive accessibility and thus their behavioral relevance as well. The time which was necessary to answer the questions about the attitudes was found to decrease significantly with the number of surveys participated in the past. The linear relationship between survey experience and attitude accessibility however proved less predictive than the fact whether the respondents had any survey experience at all. This suggests that the marginal effect of more direct experience on attitude accessibility decreases rapidly after the first survey participation. We conclude that the amount, and in particular the existence, of survey experience increases attitude accessibility, and concomitantly the effect of attitudes toward surveys on the susceptibility to nonresponse, and thus a relevant factor for survey data quality.

We found that respondents with positive attitudes toward surveys refrained more often from responding 'don't know' and were more reluctant to refuse to answer questions. Thus a more favorable evaluation of surveys reduces the number of missing values and thus the potential nonresponse bias. On a theoretical basis, we have assumed that the motivation of these respondents was to support the aim of surveys to collect complete and valid information, which implies a high motivation towards accuracy. If this applies, the answers should reflect the best possible approximation to the 'true scores'. However, we cannot rule out the possibility that a positive evaluation of surveys leads the respondents to feel an obligation to answer, although the question has not been understood or the necessary information was not available from memory. Furthermore, in the case of pressures due to social desirability, the respondents may simply choose to answer in accordance with this incentive instead of refusing to answer. In this case a positive evaluation of surveys would decrease nonresponse bias but increase random and systematic response bias. In order to test for these alternative possibilities we would need a well designed validation study that compares the validity of answers from respondents with positive and negative attitudes toward surveys to predict a theoretically assumed outcome.

Since our data is based on a probability sample in a metropolitan area, the observed distributions of survey attitudes and the amount of interview experience cannot simply be assumed to be representative for Germany as a whole. It is well known that market research firms and scientific research organizations are concentrated in large cities, a fact which results in a relatively high level of interview experience in these areas (McDaniel et al., 1985: 76). Thus, we should expect that in our urban sample, respondents' susceptibility to nonresponse is disproportionately strongly determined by their survey attitude. This should be less the case in subgroups of the population with less interview experience where situational determinants can be expected to gain more influence. It would be highly desirable to test these expectations in a more large scale, nationally representative study.

Notes

[1] Normally what is meant with 'don't know' responses is that respondents cannot answer a question because they don't have the required factual information to hand. In this paper 'no opinion' answers are included in this category as well. These are cases where subjects indicate that they do not to have a sufficiently clear opinion to answer an attitude question.

[2] The question was worded as follows: 'I can assure you that your response will be treated completely confidentially and anonymously. Could you please then tell me the level of your net-income. Please select one of the income brackets from this list'.

[3] The questions were about the respondents happiness, their racial attitudes and their opinion about the legalization of abortions, different environmental issues and about what they think about homosexuality. Furthermore, questions about party preferences and the evaluation of political issues, such as for instance how to fight tax evasion, the appropriate security policy and issues of foreign aid, were included as well. In several cases subjects were asked about how important they regard the particular topic. The factual questions were about the respondents socio-economic characteristics, the frequency of alcohol and television consumption, as well as about how often they did sport or smoked cigarettes.

[4] Items were asked in a randomized order so that no systematic learning effects affected the response latencies for items later in the list.

[5] For both outcome variables the data distributions were found to be affected by overdispersion: the alpha values for the 'don't knows' and 'refusal' count variables were significantly different from zero ('don't knows': α=.34, $p \leq .05$; 'refusals': α=1.65, $p \leq .05$). Under this condition pois-

son regression leads to underestimated standard errors for the regression coefficients (Long and Freese, 2003: 266). Thus negative binomial regression was used in order to avoid this problem.

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Table 1. Respondents' attitudes toward surveys and the time necessary to answer the items

	Attitude Responses [a)] Mean (Std.)	Response Latencies [b)] Mean (Std.)
1. Surveys are important for science, politics and the economy	5.4 (1.6)	3.0 (4.2)
2. Public opinion surveys make society more democratic	4.4 (1.8)	5.0 (6.0)
3. Participation in surveys is a matter of self-interest	4.6 (1.8)	4.2 (5.3)
4. Everybody should take participating in surveys for granted	4.7 (2.0)	4.3 (7.3)
5. Surveys make life more varied and are interesting in themselves	4.5 (1.7)	3.3 (5.2)
6. In surveys you are at last able to articulate your own opinion	4.9 (1.9)	4.6 (7.8)
7. In most cases survey results are correct	4.7 (1.5)	5.6 (8.8)
8. Most surveys are carried out in a reliable and responsible way	4.7 (1.5)	4.9 (8.8)
9. Ordinary, representative people are interviewed in surveys	4.9 (1.8)	5.6 (7.0)
10. Survey participants are likely to give their true opinion	5.0 (1.7)	4.1 (4.5)
11. Survey participants try hard to respond accurately	5.3 (1.5	4.6 (5.4)
12. Surveys only keep you from doing more important things	4.7 (1.8)	4.9 (6.9)
13. Topics are addressed in surveys that don't concern anybody else	4.0 (1.9)	6.3 (7.6)
14. Far too many surveys are carried out in Germany	4.2 (1.9)	4.1 (7.2)
15. It is exhausting to answer so many questions in surveys	3.9 (2.0)	4.9 (6.6)
16. Interviewers are unpleasant and obtrusive people	4.8 (1.9)	5.8 (8.9)
Total scale	4.7 (0.8)	4.7 (3.5)
Number of cases	N=139	

[a)] Responses varied between 1 (negative attitude) and 7 (positive attitude). Responses on item 1 to 11 were recoded in order to fit the direction of the other items. [b)] Response latencies are in seconds

Table 2. Different indicators for the respondents' susceptibility to nonresponse

	Refusal on question type ...			Don't knows
	Income Percent (N)	Other Percent (N)	All Percent (N)	All Percent (N)
Total number of questions respondents did not answer				
- None	89.9 (125)	71.2 (99)	71.2 (99)	49.6 (69)
- One	10.1 (14)	20.1 (28)	14.4 (20)	29.5 (41)
- Two	--	5.0 (7)	9.4 (13)	15.1 (21)
- Three	--	2.9 (4)	2.2 (3)	5.0 (7)
- Four	--	0.7 (1).	2.2 (3)	0.7 (1)
- Five	--	--	0.7 (1)	--
All	100 (139)	100 (139)	100 (139)	100 (139)
Mean percentage of all questions respondents did not answer	10.1 (14)	.52 (.97)	.64 (1.22)	.96 (1.15)
Number of questions included	1	80	81	81
N=139				

Table 3. Interviewers' judgments about respondents' willingness to answer questions

Respondents' willingness was ...	Percent (N)	Percent (N)
- Good	82.7 (115)	82.7 (115)
- Fair	12.2 (17)	
- First good, then bad	--	17.3 (24)
- First bad, then good	2.2 (3)	
- Bad	2.9 (4)	
Total	100 (139)	100 (139)

Table 4. Correlation between indicators for different kinds of item nonresponse (Cramer's V)

	Judgement of response unwillingness	Refusal to answer ...		
		income question	other questions	'Don't know' responses
Judgement of response unwillingness	--			
Refusal to answer income question	.04	--		
Refusal to answer other questions	.11	.61 *	--	
'Don't know' responses	.10	.15	.23 *	--

N=139, Significance: * $p \leq 0.05$.

Table 5. Determinants for the cognitive accessibility of respondents' attitudes toward surveys (OLS regression results)

	Model 1 B (t-value)	Model 2 B (t-value)	Model 3 B (t-value)
Control variables			
Age (years)	.08 (4.35)*	.07 (4.26)*	.07 (3.91)*
Sex (female) a)	.04 (0.07)	.03 (0.06)	-.10 (0.18)
Income (in 1.000 Marks)	-.48 (1.94)	-.41 (1.65)	-.34 (1.38)
Education b)			
- Compulsory Education	-.73 (1.06)	-.96 (1.39)	-1.03 (1.51)
- Secondary school certificate	.00 (0.00)	.09 (0.11)	.08 (0.10)
Survey experience			
Surveys in the past (number)	--	-.18 (2.23)*	-.09 (0.95)
Has survey experience? (yes) c)	--	--	-1.45 (2.07)*
Constant	2.35 (2.52)*	2.89 (3.04)*	3.85 (3.68)*
Corrected R^2	.10	.13	.15
N	139	139	139

Significance: * $p \leq 0.05$; omitted categories: a) male; b) high school certificate; c) no survey experience.

Table 6. Effect of respondents' attitudes toward surveys on different aspects of nonresponse

	Model 4 'Don't know' responses	Model 5 Refusals excluding income question	Model 6 Refusals of the income question	Model 7 Response unwillingness
	B (Std Error)	B (Std Error)	B (Std Error)	B (Std Error)
Control variables				
Age (years)	.01 (.01)	.00 (.01)	-.01 (.02)	.03 (.02)
Sex (female) [a)]	.38 (.21)	.01 (.35)	-.53 (.59)	.26 (.58)
Income (in 1.000 Marks)	-.05 (.09)	.01 (.15)	.06 (.24)	.07 (.25)
Education [b)]				
- Compulsory Education	.27 (.26)	-.01 (.43)	-.04 (.73)	1.25 (.74)
- Secondary school certificate	-.16 (.32)	.65 (.46)	.55 (.76)	-.85 (1.04)
Explanatory variables				
Survey attitude (scale scores)	-.30 (.13)*	-.45 (.23)	-.34 (.39)	-.63 (.37)
Constant	.72 (.68)	1.02 (1.11)	-.07 (1.95)	-1.20 (1.92)
Model log likelihood	-181.7	-130.7	-43.8	-52.8
McFadden's Pseudo R^2	.03	.03	.03	--
N	139	139	139	139

Significance: * $p \leq 0.05$; omitted categories: [a)] male; [b)] high school certificate. Models 4 and 5 are results from negative binomial regression analyses; model 6 are logistic regression results; Model 7 are results from a multilevel regression fixed effects analysis with random effects for interviewers controlled.

Table 7. Effects of attitudes toward surveys and attitude accessibility on different aspects of nonresponse

	Model 8 'Don't know' responses	Model 9 Refusals excluding income question	Model 10 Refusals of the income question	Model 11 Response unwillingness
	B (Std Error)	B (Std Error)	B (Std Error)	B (Std Error)
Control variables				
Age (years)	-.00 (.01)	.00 (.01)	-.02 (.02)	.02 (.02)
Sex (female) [a)]	.38 (.21)	.05 (.34)	-.51 (.60)	.28 (.63)
Income (in 1.000 Marks)	-.04 (.09)	-.09 (.16)	.04 (.26)	.04 (.28)
Education [b)]				
- Compulsory Education	.29 (.26)	-.06 (.43)	-.01 (.76)	1.53 (.85)
- Secondary school certificate	-.14 (.32)	.77 (.45)	.68 (.79)	-.51 (1.10)
Explanatory variables				
Survey attitude (scale scores)	-.41 (.23)	-1.24 (.39)*	-1.27 (.61)*	-2.05 (.72)*
Response latencies (seconds)	-.06 (.19)	-.76 (.33)*	-.86 (.46)	-1.13 (.57)*
Attitude • latencies	.02 (.04)	.17 (.07)*	.19 (.09)*	.27 (.12)*
Constant	1.18 (1.11)	4.86 (1.87)*	4.26 (2.93)	5.03 (3.41)
Model log likelihood	-181.0	-126.5	-41.9	-47.3
McFadden's Pseudo R^2	.03	.06	.08	--
N	139	139	139	139

Significance: * $p \leq 0.05$; omitted categories: [a)] male; [b)] high school certificate. Models 8 and 9 are results from negative binomial regression analyses; model 10 are logistic regression results; Model 11 are results from a multilevel regression fixed effects analysis with random effects for interviewers controlled.

Table 8. Effect of attitudes towards surveys on respondents' willingness to answer questions as a function of the accessibility of these attitudes (predicted values from regression model 9, 10 and 11)

	Respondents' attitudes toward surveys		
	negative	positive	Sensitivity
Attitude accessibility	Percentage of questions excluding the income question respondents refused to answer		
High (fast response latencies)	0.68	0.13	- 0.55
Low (slow response latencies)	0.35	0.44	+ 0.09
Attitude accessibility	Percentage of respondents refusing to report their income		
High (fast response latencies)	16.7	3.7	- 13.0
Low (slow response latencies)	7.9	11.9	+ 4.0
Attitude accessibility	Percentage of respondents judged by interviewers to be less than perfectly willing to answer questions		
High (fast response latencies)	10.6	0.8	- 9.8
Low (slow response latencies)	6.3	7.9	+ 1.6

The predicted values are computed for one standard deviation under (negative attitude) and one standard deviation above (positive attitude) the average of attitudes toward surveys in the sample. The same applies to the response latencies, where 'fast response latencies' represents subjects with one standard deviation under and 'slow response latencies' subjects with one standard deviation above the sample mean of response times. The continuous control variables 'income' and 'age' were fixed at the sample means and sex as well as education on the reference category.

Nr.	Author	Title
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