The Interview Process Model and the Concept of Interviewer Burden

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1 Introduction

In the survey literature many different aspects of quality in interview surveys have been studied or discussed, e.g., interviewer influence on response and participation, interviewer strategies and attitudes, interviewer variances, and interviewing techniques (standardised versus less standardised methods). In some areas theories have been developed, e.g. Groves and Couper (1998) developed the theory of survey participation and Groves, Couper and Cialdini (1984) identified a number of compliance principals that can be used to improve participation in surveys. There are some more general theories concerning the respondent's cognitive process (Tourangeau, 1984) and decision processes related to item nonresponse (Beatty and Herrmann, 2001). The latter apply to surveys in general, regardless of mode.

The need to minimise the cognitive burden for the respondent is often emphasised by survey methodologists. Even if we decrease the respondent's cognitive burden, in an interview survey that is not enough to guarantee good quality data. The interviewer and the interaction between the interviewer and the respondent are also crucial for data quality. Any flaws in the interview process can decrease the quality of the data. Therefore we need to worry not only about the respondent burden but also the burden imposed on the interviewer. Often interviewers are seen as a quality guarantee and less effort is put on question wording and other processes because the interviewer will be there to correct the mistakes. Our hypothesis is that it is very likely that the greater the cognitive burden is on the interviewer the more likely it is that some error will occur as a result of that burden.

This paper presents a model of the interview process and discusses the components of the model and their effects on data quality. The focus is on the interviewer and the cognitive steps involved in an interview. The paper discusses the general concept of interviewer burden and possible effects on data quality.

2 Interviewer Effects

Interviewers contribute both to the bias and variance component in a survey. An estimate can be biased if interviewers have a tendency to influence their respondents to choose a particular response alternative that is not correct or in other ways provide answers that are particular. These influences can be of two kinds: (1): Interviewer errors or behaviours are similar resulting in biased results or (2): Interviewer errors or behaviours vary resulting in correlated interviewer variance. In practice, however, it can be difficult to estimate this correlated variance component (rho) since it requires that we carry out an interpenetrated study.

In an early study Hyman, Cobb, Feldman, and Stember (1954) showed that interviewers increased variance through nonstandardised interviewing procedures. This finding caused a shift from nonstandardised interviews to strictly standardised interviews in a desire to reduce interviewer effects. The main idea was that each sampled person should get the same stimuli. Studies of interviewer effects also suggest that the presence of an interviewer can cause social desirability bias on sensitive questions and that interviewer attitudes can affect e.g. survey outcome in terms of noncontacts and refusal rates (Hox and de Leeuw 2002). Groves (1989) found that interviewer variance (rho) is larger in face to face interviews than in telephone interviews.

Schuman and Presser (1981) found that even small changes in question wording can have substantial effects on the response distribution. Mangione et al (1992) found that questions that require interviewers to probe are those that are most subject to interviewer effects. Schober and Conrad (1997) found that certain questions are not ambiguous themselves but the way these questions correspond to a respondent's circumstances is ambiguous. They call this type of ambiguous correspondence between questions and situations "complicated mappings." They found that these complicated mappings are more likely to be classified incorrectly than simple mappings.

In a study by Lepkowski et al (1997), two types of interviewer-respondent exchanges were identified:

simple straightforward and complex. They found a strong relationship between behaviour and recording errors among complex questions. Respondents that answered outside the response frame or elaborated on the answers, generated higher levels of recording errors. Recording errors seemed to be suppressed by a respondent expressing uncertainty about the answer. Incorrect probing (often failing to probe when needed) by interviewers generated higher rates of recording errors. Interviewers had greater difficulty in handling complex exchange and recording the answers to them accurately.

Dykema, Lepkowski and Blixt (1997) used systematic coding of interviewers and respondents and a medical record to check how behaviours affected the accuracy of response in a health survey. They did not find any relationship between departure from exact reading of questions and the accuracy of responses. In fact they found that one particular substantive change to one question (the number of visits to medical doctors) gave a more accurate response. This indicates that some interviewers tailor the questions to a specific respondent and alter the questions so that the intent of the question is communicated in a better way.

Thus we know that interviewer effects occur. A model of the interview process can help us use a more systematic approach to identify steps in the processes that still need to be illuminated. The model helps us visualise the steps and design studies appropriately.

3 Model
To be able to improve and reduce interviewer effects we need to know where in the interview process they are most likely to occur. The model presented in Figure 1 describes the interview process. The upper part of the model refers to the respondent's task, the cognitive steps the respondent has to go through (Tourangeau, 1984) and the availability of the requested information in memory (Beatty and Hermann, 2002). The lower part of the model addresses the interviewer's cognitive process and interviewer access to concepts and definitions used in the survey. The data collection steps are marked as grey boxes.

Respondent
There are a number of theories and models developed describing the survey situation from the respondent's perspective. The first step in the data collection model is to get participation. As mentioned Groves and Couper developed a theory of survey participation and identified number of

compliance principals (Groves, Cialdini and Couper). Tourangau (1984) developed the response model, describing the cognitive steps the respondent has to go through when answering a question. Tourangeau's response model has four steps: comprehension, retrieval, judgement and response. Errors can occur in all four steps. Beatty and Hermann (2002) classify respondent knowledge in four different cognitive states: available, accessible, generable and inestimable. Depending on the cognitive state we can expect different data quality.

4 Interviewer Cognitive and Retrieval of Information Model
From the model we can see that there are a number of things that the interviewer is expected to do. In addition to the steps in the model the interviewer is also expected to:
- motivate the respondent to provide answers to all questions. If the respondent does not feel motivated to participate or does not understand the questions the result could be item nonresponse or satisficing.
- make the respondent feel comfortable to give an honest answer. This is particularly important when the survey contains sensitive questions. If the respondent does not feel comfortable with giving the correct answer he/she might deliberately report a wrong answer. This increases the risk of social desirability bias.
- be able to handle the computer/instrument during the interaction with the respondent. This includes e.g., being able to handle the computer physically (in case of CAPI) and skip to the right question (especially a concern in PAPI.). If the computer causes problems to the interviewer then it might also interfere with the interaction between interviewer and respondent.
-follow social norms and adequately represent the survey organisation.

Understand question - comprehension
There is a link between how the interviewer understands a question and how the respondent will understand that same question. Therefore an interviewer's understanding of a question is important. The interviewer needs to be familiar with how to handle border-line cases, e.g. if a person has been baby-sitting during a week, does that count as a job or not? Questions can be double-barreled and the interviewer should know the intention of the survey researcher. The interviewer can overlook instructions and therefore not be familiar with the exact definition. This process step can bias the estimates and cause interviewer variance e.g., if a double-barreled

question is interpreted differently by different interviewers If the majority of the interviewers will interpret it in the same incorrect way then this can lead to a biased estimate.

(Ask question)

The way the interviewer asks a question can affect the final outcome. Studies of different interviewing techniques conducted by Schober and Conrad et al (1997) show that conversational interviewing technique can yield more accurate response than standardised interviewing technique. The conversational interviewing technique requires more knowledge and effort on the part of the interviewer. Today most survey organisations use a mix of those two techniques, starting out with a standardised questionnaire but allowing interviewers to probe to a different extent.

When asked to clarify a question the interviewer might reformulate the question in a leading way. Questions can have terms that are not familiar to the respondent and interviewers then need to use other terms to explain the meaning to the respondents. Different interviewers might use different terms and again this step can cause both interviewer bias and variance.

(Pick up cues and probe)

If the interviewer does not pick up cues that a respondent might have a problem with a question and does not probe, this can lead to incorrect estimates. This is a step in the interview process that we do not have much information about and it is closely linked to the next three cognitive steps. What cues and signals are interviewers picking up during the interaction with the respondent? What strategies are interviewers using for picking up cues in face to face interviews and in telephone interviews? How do interviewers choose the right probes? Different interviewers might pick up different cues and the amount of probing might also vary.

Understand respondent's problem with question

The interviewer should be able to understand a problem that a respondent has with a question. If the interviewer does not understand, it can lead to incorrect estimates. Sometimes the respondent might not explicitly tell the interviewer that he/she does not understand. The interviewer should then be able to pick up cues and probe what the problem is. Even if the respondent tells the interviewer what the problem is, the respondent has to express the problem in such a way that the interviewer will understand the exact problem. Interviewers also vary in the amount of effort they put into

understanding the problem a respondent has with a question.

Retrieve definitions and concepts

Definitions and concepts are essential in a survey. If the interviewer cannot recall the correct definitions this can lead to biased estimates or increased variance. The interviewer should be able to remember the definitions received in training or from instructions. The interviewer has to adopt a retrieval strategy. If an interviewer is working on many surveys at the same time, it will be more difficult to keep all definitions and concepts in mind. It could also be difficult to distinguish between definitions in different surveys if the concepts are very close.

The model developed by Beatty and Herrmann (2002) on respondent knowledge can be adopted to fit interviewer knowledge of concepts and definitions. Interviewer knowledge can be in one the following four cognitive stages:

- Available: the concepts and definitions can be retrieved with minimal effort
- Accessible: the concepts and definitions can be retrieved with effort
- Generable: the concepts and definitions are not exactly known, but may be estimated using other information in memory.
- Not available: the requested concepts and definitions are not known and there is no basis for estimation.

The accuracy of this step is affected by e.g. the amount of concepts and definitions the interviewer has to remember, the cues the instructions provide, and how long ago the interviewer last had to recall the definitions. The first cognitive state, when concepts and definitions are easily available, is the least demanding state for the interviewer. The other cognitive states are likely to be more demanding and interviewers are likely to handle these states differently. For example, if a definition is not known exactly (generable) the interviewer might recall a similar problem from an earlier survey/ interview and adopt the same definition to this new survey/interview. Some interviewers might choose to adopt this strategy while others might choose to report "don't know".

Formulate probes

The interviewer's skill in formulating probes is important for the final outcome. The probe has to be neutral and convey the meaning in the way the survey researcher intended. This requires that the interviewer is very familiar with the survey goals,

definitions and concepts, and how to deal with e.g. borderline-cases. It also requires the interviewer to understand the problem a respondent might have with a question. Interviewers vary in their skill to formulate probes.

Understand response
In order to be able to record the data the interviewer needs to translate a respondent's answer into the adequate response category. The interviewer must be able to excerpt the essential information from what the respondent is saying. Again this skill varies among interviewers.

Judgement
The process when the respondent sums up all the information, retrieved from memory and gaps in memory, to come up with an estimate is the judgement process. If the respondent has difficulties making the judgement, this task can be partially transferred to the interviewer, e.g. if the respondent does not remember the amount of times he/she did a particular thing the interviewer might probe and help the respondent to come up with a total. The interviewer might provide the respondent with a strategy to fill in gaps in memory to come up with an estimate e.g., on a question on how many hours the respondent worked in a particular week, the interviewer might encourage the respondent to think about a regular week and then to think if he/she worked more or less than during a regular week. Another interviewer might suggest a different strategy or simply put down a "don't know." The interviewer also makes a judgement of what the respondent is reporting and the accuracy based on what the respondent reported earlier in the interview.

(Record data)
The interviewer should record the answer the respondent gives into the right response alternative. If the respondent does not map the answer to the right category this task is transferred to the interviewer. The interviewer then has to decide which category corresponds best with what the respondent reports. The interviewer might choose to probe to improve this classification procedure. Some interviewers are very careful trying to choose the correct response category while others might be content with recording the first acceptable answer.

5   Implications of Interview Model
The model illustrates the links between the interviewer and the respondent and the cognitive processes involved. There are many steps in the interview process that are crucial for data quality.

Many survey organisations take measures to reduce respondent burden since it is known to affect data quality. From the model it is clear that in interview surveys it is not only the respondent burden that we need to worry about. We also need to consider the interviewer burden. Components such as the complexity of definitions and concepts, the number of surveys an interviewer works on, the design of the instrument and instructions, work environment, the time pressure, and the length of the interview will all affect data quality. There are also situations when the burden is transferred from the respondent to the interviewer, e.g., when a respondent is not sure of how his/her situation best fits the given response categories he/she might ask the interviewer to help out.

Interviewers are likely to handle interviewer burden in different ways, e.g., decrease the amount of probing, refusal conversion and/or contact attempts. We need to learn more about the different steps in the model and how interviewer burden affects data quality. If we learn more we can reduce interviewer variance and bias. We can improve interviewer training and survey design e.g., design "interviewer-friendly" instruments and instructions.

It is highly likely that the steps in the model are indeed affected by the interviewer burden and that interviewer burden affects the survey outcome. For instance, the amount of probing an interviewer does will most likely be affected by the accessibility of relevant instructions, clear concepts and definitions and the amount of interviewers she/he has to carry out as well as the number of surveys the interviewer is working on simultaneously. If the interviewer is not completely familiar with the definitions the burden probably becomes heavier than when the interviewer masters all definitions and concepts.

6   Summary
We have seen that interviewer effects can occur in all the steps in the model. If our aim is to reduce these effects we need to learn more about the mechanisms that generate them and where in the interview process problems are likely to occur. Interviewers are probably as important as the respondents in the response process. We have knowledge about respondents' cognitive processes but less knowledge about interviewers' cognitive processes.

It is important to study how interviewer burden affects data quality and how interviewer burden can be reduced.

The model can help us to design studies to decide the relative importance of the process steps on data quality. The final aim is to find survey design principals that will help us to improve our surveys.

References

Beatty, P., and Herrmann, D. (2002), "To Answer or Not to Answer: Decision Processes Related to Survey Item Nonresponse", in R. M. Groves, D. A. Dillman, J. L. Elting, and R. J. A. Little (eds), *Survey Nonrespons*, New York: Wiley, pp. 71-87.

Dykema, J., Lepkowski, J. M., and Blixt, S. (1997), "The Effect of Interviewer and Respondent Behavior on Data Quality: Analysis of Interaction Coding in a Validation Study" in L. E. Lyberg, P. Biemer, M. Collins, E. deLeeuw, C. Dippo, N. Schwarz, and D. Trewin (eds.), *Survey Measurement and Process Quality*, New York: Wiley, pp 287-310.

Groves, R. M., and Couper, M. P. (1998), Nonresponse in Household Interview Surveys, New York: Wiley.

Groves, R. M., Cialdini, R. B., and Couper, M. P. (1992), "Understanding the Decision to to Participate in a Survey", Public Opinion Quarterly 56 (4), pp. 475-495.

Groves, R. M. (1989), Survey Errors and Survey Costs, New York: Wiley

Hox, J. and deLeeuw, E. (2002), "The Influence of Interviewers' Attitude and Behavior on Household Survey Nonresponse: An International Comparison," in R. M. Groves, D. A. Dillman, J. L. Elting, and R. J. A. Little (eds), *Survey Nonrespons*, New York: Wiley, pp. 103-121.

Hyman, H., Cobb,. Feldman, J. and Stember, C. (1954), "Interviewing in social Research". Chicago, University of Chicago Press.

Mangione, T. W., Fowler, F.J. Jr., and Louis, A. (1992) Question Characteristics and Interviewer Effects, *Journal of Official Statistics*, vol. 8. No. 3, Statistics Sweden.

Schuman, H., and Presser, S. (1981), "Questions and Answers in Attitude Surveys: Experiments in question form, wording, and context," New York: Academic Press.

Schober, M. F., and Conrad, F. G. (1997), "Does Conversational Interviewing Reduce Survey Measurement Error?," *Public Opinion Quarterly*, 60, pp. 576-602.

Tourangeau, R. (1984), "Cognitive Science and Survey Methods", in T. Jabine, M. Straf, J.Tanur, and R. Tourangeau, *Cognitive Aspects of Survey Design: Building a Bridge Between Disciplines*, Washington, DC, National Academy Press, pp. 73-100.
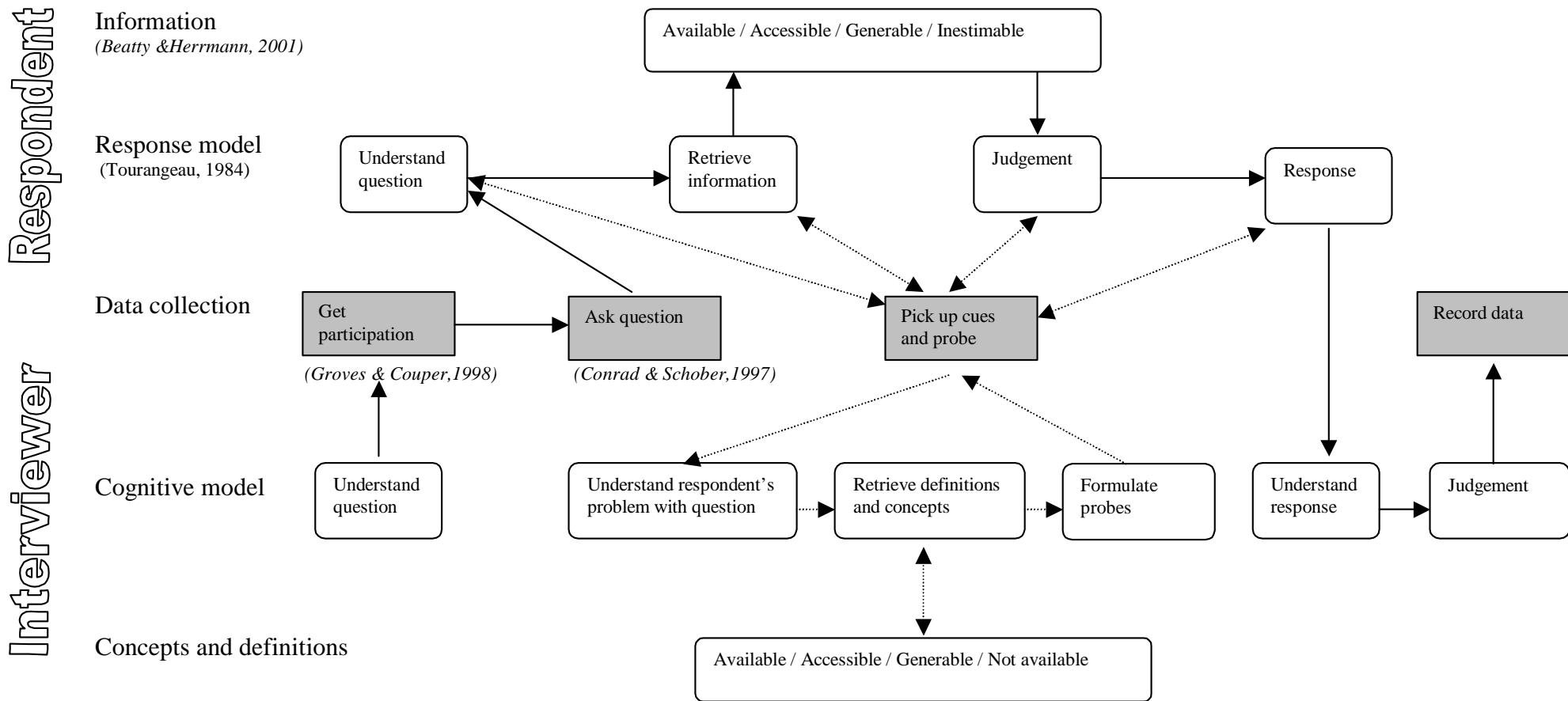
Interview process

Figure 1[.]

[.] Lilli Japec, Statistics Sweden, February 4, 2002