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Supporting paper

**THE INTERVIEWER EFFECT ON THE
DATA COLLECTION OF SENSITIVE QUESTIONS**

Submitted by National Statistical Institute (ISTAT), Italy*

I. Introduction

1. As it is well known, the interviewer has a great impact both on the survey participation and on data quality. The aim of this paper is to estimate the interviewer effect on collecting sensitive data. To this purpose, multilevel models have been applied to the citizen's safety survey data. Istat carries out this survey every 5 years, and the first occasion was in 1997. The survey is aimed at collecting information on the crimes against people and against property as well as the perception of safety in the environment and the adopted safety measures. A random sample of 50,000 households has been selected. In each sampled household only one people aged 14 and over has been randomly selected and interviewed. A CATI technique has been adopted and the interviews have been carried out by 200 female interviewers. The data collection phase lasted three months. Given the sensitiveness of the survey information content, particular attention has been paid to the interviewers' training and supervision. Special training courses hold by a psychologist were organized in order to prepare the interviewers to handle with the

* Paper prepared by Laura Bocci, Università degli Studi di Roma "La Sapienza" and Maria Giuseppina Muratore, Marina Signore, Giovanna Tagliacozzo, ISTAT.

sensitive and emotional aspects involved in their work. In addition, for the purpose of supporting and assisting the interviewers, a continuous training during the whole data collection phase was set up.

2. In this paper, we focus on the most sensitive questions asked in the survey: the questionnaire section 16 where information on sexual crimes is collected only on women between 14 and 59 years old, and section 17 aimed at collecting information on safety systems. In these cases, the survey questions investigate even more private behaviors and very intimate and painful experiences where the interviewers' role is crucial. Therefore, since interviewers have to face difficult situations, emotional distress and psychological pressure, they are asked to react with "measured empathy" when interviewing a victim and trained consequently. As described, the survey has been planned and carried out with a great awareness of the interviewers' role for assuring the quality of survey results. Nevertheless, the interviewers might have had an impact on the observed data. By applying proper models (see section 2), the interviewer effect has been estimated for the most sensitive questions. The results of the analyses are presented in section 3.

II. The multilevel model

3. The structure of the data to be analyzed is clearly hierarchical, since respondents are nested within interviewers. An appropriate model to analyze this type of hierarchical data is a generalized multilevel linear model. This model allows us to analyze correctly the effects introduced by interviewers on data quality. There are two levels of analysis: level two, the highest, is that of interviewers, and level one, the lowest and nested within the higher level, is that of the respondents. The two basic prerequisites required in order to perform the analysis are satisfied: 1) the random allocation of the interviews to the interviewers; 2) the interviewers are considered as a random sample of an unobserved population of potential interviewers.

Let us assume that Y_{ij} denotes the dichotomous outcome variable for level-one unit i (respondent) in level-two unit j (interviewer). The model can be written as

$$Y_{ij} = \underbrace{\left\{ 1 + \exp \left(- \left[\beta_0 + \sum_{r=1}^H \beta_r X_{ijr} + U_{0j} \right] \right) \right\}^{-1}}_{P_{ij}} + E_{ij}$$

where E_{ij} represents some individual-dependent residual and the expected proportion is modeled using a logit link function which depends on both the explanatory variables X_r ($r = 1, \dots, H$) and a random interviewer-dependent deviation U_{0j} . The deviations U_{0j} , which are assumed to be independent identically distributed random variables $N(0, \sigma_u^2)$, representing the variability due to interviewers, are the random part of the multilevel model also known as *variance component model*.

4. The multilevel logistic regression model can also be formulated as a so-called threshold model (Snijders & Bosker, 1999) where the dichotomous outcome Y is conceived as the result of an underlying non-observed continuous variable where the threshold is set equal to 0. Therefore the multilevel regression model is equivalent to the following threshold model

$$Y_{ij}^* = \beta_0 + \sum_{r=1}^H \beta_r X_{ijr} + U_{0j} + E_{ij}^* .$$

In this model, in order to represent the logistic regression model

and by analogy with generalized linear models (Long, 1997), the level-one residual E_{ij}^* of the underlying variable must have a logistic standardized distribution with mean zero and variance constrained to be 1, while the level-two deviations U_{0j} are still assumed to be $N(0, \sigma_u^2)$. All variables are independent.

5. Since it has been recognized that interviewers can have a systematic effect on the answers they collect, observations within the same interviewer are dependent or correlated. In this context a multilevel analysis with no explanatory variables at all, the so called *intercept-only model*, producing the estimates of level 2 variability allows us to evaluate the intraclass correlation for the interviewer effect which, under the assumptions made, is $\rho = \sigma_u^2 / (1 + \sigma_u^2)$.

This coefficient is equal to the correlation between values of two randomly drawn respondents in the same, randomly drawn, level-two unit: therefore it indicates how much variance there is at the interviewer level since it is the proportion of variance that is accounted for by the interviewer.

III. Main results

6. The *intercept-only model* has been applied to the results concerning the sexual crimes and the safety systems. It is worth noting that the section on sexual crimes is characterized by a structure with an increasing degree of sensitiveness. The results of our analyses on the interviewer effect show that there is a direct relationship between the variability due to interviewers and the sensitiveness of the questions. When asking the questions concerning sexual harassment where interviewers have emphasized every daily life contexts such as bus, street, cinema, instead of more intimate places such as work or house, which are perceived as more sensitive ones, the interviewer effect is 0.03. With regard to the first question on attempted rape, the intraclass correlation coefficient is 0.12, but it decreases to 0.02 for the question concerning attempted rape during the last three years. This result shows that the interviewers feel a greater embarrassment when a sensitive topic is asked for the first time. In a similar way, it is possible to explain the lower interviewers' impact for attempted rape with respect to rape. The rape is a much more sensitive subject (with an intraclass correlation coefficient of 0.39) if compared with the attempted rape where the women had the chance to avoid such a negative and painful experience and can be considered as "winners" from this point of view. It is not the case of the questions concerning the rape where the interviewer is aware that she is asking questions to a raped woman. Therefore sensitiveness concerns not only the content of the questions, which are aimed to reconstruct the story of the crime, but also the painful climate which characterizes the interviewer-respondent interaction. Other descriptive analyses carried out show that the women are not reluctant to talk about their stories, but the high intraclass correlation coefficient witnesses the interviewers' difficulties to treat this sensitive topic. The interviewer effect has also been evaluated with regard to the item non responses for sensitive questions. The interviewer intraclass correlation is 0.61 for item non responses to the different questions about violence. It is interesting to note that the interviewer effect on item non responses is very high and does not change regardless the increasing sensitiveness of the questions. Since no information on the interviewers' characteristics was available due to privacy issues, only the *variance component model* with respondent characteristics as explanatory variables can be applied. Only two explanatory variables were found to be significant. The first one is the social and economical position of the respondent: item non responses decrease when the socio-economic position is higher showing that for these women it has been easier to recognize and to manage the violent experience. The second one is the "difficulty in answering to the section" as evaluated by the interviewer at the end of the interview. Nevertheless when this variable is

depurated from the interviewer average influence, no variables remain significant: all women become equal in front of violent experience.

7. With regard to safety systems, it comes out that the interviewer effect is not the same for all the questions on protection systems. In fact, it is higher for more sensitive and private questions, regarding locked windows (0.16) and the safe strong box (0.23), while it is lower for other questions concerning the possession of an armored door or of an alarm system (0.04 for both). Perhaps this is due not only to the different interviewers' behaviors, but above all to the citizens' preferences more or less desirous of showing their defense possibilities. Even if there was a good item response level, some of the households preferred not to answer: in these cases the interviewer effect is high and steady for all safety strategies ranging from 0.37 to 0.41. This reveals the great importance assumed by the interviewers' ability to create a confidence climate that helps to speak about sensitive topics. The application of a *variance component model* on the interviewees' non response behavior helps us to better understand the interviewer effect on sensitive questions. The results of the analysis show: 1) an intraclass correlation for the interviewers of 0.38, which is still high even if less than the one obtained from the sexual violence non response model; 2) the importance of several household and interviewees' characteristics such as the geographical context, the age and the education level (non responses are inversely proportionally correlated with the interviewee's municipality wideness, furthermore they decrease in the South of Italy and in the Islands when the educational level is higher and the respondent is younger); 3) the interviewee's availability; 4) the importance of some professional features of interviewers represented by explanatory variables such as their experience in the survey, the number of completed crimes' sections of the questionnaire (that represent the ability to help the respondent to disclose himself with regard to his own experience), the interviews' length, the non response rate.

8. This means that the focus on quality when approaching the household and in the carrying on of the interview let the difficulties' decrease and the response increase.

4. Conclusions

The analyses show that the interviewers affect the quality of the observed results. Their impact increases together with the sensitiveness of the questions they are asking. Moreover the results underscore that the attention to the relationship with the interviewees and the creation of a trust climate in the whole interview's setting forecast the possibility to obtain more sensitive information and to gather a higher quality interview. It can be said that the attitude and the behavior of the interviewer in any step of the interview has some consequence: the experience is capitalized in both a positive and a negative direction.

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