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Online cognitive interview with enterprises and institutions

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Abstract

The cognitive interview provides a view of the response process elicited by survey questions and allows researchers to identify those sources of response error not identifiable during data collection. Usually, it is conducted in-person and as a part of the questionnaire design process for household surveys.

Because of the Covid-19 pandemic, which has made it impossible to conduct in-person interviews, Istat had to consider using video-conferencing technology for cognitive interviewing. Three surveys were submitted to online cognitive pretest: the Census of Public Institutions, the Survey on Information and Communication Technology (ICT) Usage in Enterprises, and the Survey on Maritime Transport.

The first was carried out in April 2020 on the section on smart-working newly introduce. Due to schedule constraints, it was possible to involve only three institutions; nevertheless, it helped us understand how to conduct an online cognitive interview efficiently. The second and the latter, carried out in November and December 2020, involved a more significant number of participants and allowed us to focus on the advantages and disadvantages of this method.

Our experience suggests that video-conferencing technology is a viable option for conducting cognitive interviews with institutions and enterprise respondents. Although there are some differences from in-person interaction, they do not seem to affect the quality of the rapport between interviewers and interviewees. The online cognitive interview also allows to reach a varied and dispersed sample and ensures greater flexibility to the interviewees in choosing where and when to participate.

Online cognitive interviews for businesses and establishments surveys

Cognitive interviewing (Willis 2005) is a cognitive research method for evaluating and testing survey questionnaires; it is aimed at identifying possible sources of response error and suggesting changes to survey questions to reduce such errors. Usually, it is conducted in-person and as a part of the questionnaire design process for households or individuals' surveys. "Cognitive interviewing entails administering draft survey questions while collecting additional verbal information about survey responses, which is used to evaluate the quality of the response or to help determine whether the question is generating the information that its author intends" (Beatty and Willis 2007).

We will focus on the methodological and practical aspects of using cognitive interviews, not in person but online, and on respondents other than households or individuals: i.e., companies and institutions.

In recent years some scholars have started to conduct the cognitive interview online. In early studies, the web has been used in asynchronous mode, without involving a cognitive interviewer. This method, called *web probing*, consists of asking online probing questions during the self-administration of a web survey. “Open and closed probing questions are developed and then implemented into an online questionnaire. In the concurrent

probing format, respondents first answer a survey question and after clicking on the next button receive one or more probes on the next survey page" (Lenzner and Neuert 2017, p. 2). Sometimes, respondents have to verbalize their thoughts while filling in the online questionnaire and a video-recording system records their verbal protocol (online think-aloud cognitive interview). The *web probing* method is considered a valid alternative to face-to-face cognitive interviews because it allows access to larger and more diverse samples than the usual ones and to cancel out possible interviewer effects.

The absence of the interviewer is also a significant limitation: as Lenzner and Neuert point out, without an interviewer " no one can probe for more information, follow up on incomplete answers or provide clarification of the tasks. Probing is restricted to the scripted, questions previously programmed and implemented into the Web survey. Moreover, no one can motivate the respondents during completion of theWeb survey to answer the (open) probing questions thoughtfully and elaborately" (Lenzner and Neuert, 2017, p.2; see also Meitinger and Behr 2016).

In 2020 there were few studies that used video call systems for conducting online cognitive interviews in synchronous mode, although this mode has spread in qualitative but also in quantitative research. Indeed, the Covid 19 Pandemic has accelerated the ongoing process, widening the audience's access to new communication technologies.

Thanks to technological advances, researchers can conduct remote or virtual cognitive interviews using video-conferencing software. This allows for a more geographically disperse sample since participants do not be in the same physical location as the cognitive interviewer. In addition, remote cognitive interviewing enables participants to complete the study in a more natural setting (compared with traditional lab-based cognitive testing) and frequently relies on participants using their own devices (Geisen and Murphy 2020)

Cognitive interviews are traditionally based on the four steps cognitive response model proposed by Tourangeau in 1984: comprehension of the data request, retrieval of relevant information from memory; judgment of the adequacy of the response and communication of the response. But establishment and establishment surveys have specific characteristics that considerably influence the response process (Bavdaz et al., p. 268). Sudman et al. (2000) proposed a response process model for establishment surveys that adds four more steps to the response model: three steps ahead (the encoding of information in company records; the selection and identification of the respondent or respondents; the assessment of priorities) and one to follow (the release of the data).

In a survey for an institution or an enterprise, respondents answer not about themselves but on behalf of the organization. In the bigger organizations, there are in place policies on surveys but reporting on surveys is not a company's highest priority task, "it bears a cost without an associated revenue" (Willimack and Nichols, 2010, p.11); in the smaller companies, there is no penalty for the missing answer, and in many cases, they don't have dedicated staff to answer to the surveys and delegate the compilation to external accountants. In this type of survey, the selection of the respondent is under the control of the organization that decides, based on the kind of data required by the survey, who is the person that knows the data and who has the authority to release the data. For multi-sector surveys, multiple respondents may be needed, and ideally, we should test the questionnaire for all these types of respondents to ensure that the questionnaire works for all of them.

In these surveys, the burden is much more "dependent on the availability of data and the ease with which data can be retrieved than on the length of the survey form" (Willimack and Nichols, 2010, p. 13): so in the cognitive interview, we need to focus on the retrieval process of the requested data from organizational records, investigating if the data already exists in organization records, if they are available to the respondent, and if they are recorded in a way that meets the survey request.

Online cognitive interview on enterprises and institutions at Istat

At Istat, we had many experiences with in-person cognitive interviews and one experience with the web probing technique; but none of us had ever conducted online cognitive interviews until the pandemic of Covid-

19 begun. In March 2020, Italy entered a strict national lockdown that restricted the movement of the population in response to the growing pandemic. At that time, we were working on the questionnaire of the 2020 Census of Public Institutions, which included a new section of survey questions on the smart-working issue. Since direct meetings between people were forbidden, we could no longer conduct in-person interviews. We had only a few days to pretest this new section, so we considered using the video-conferencing technology for cognitive interviewing. We tried to arrange and conduct a quick session of online cognitive interviews. Because of scheduling constraints, the first experience was just an attempt, but we learned valuable lessons for the future. Since that successful experience, two other institution and enterprise surveys have been submitted to online cognitive pretest: the Survey on Information and Communication Technology (ICT) Usage in Enterprises, and the Survey on Maritime Transport.

The Census of Public Institutions

We carried out the first experience of an online cognitive interview with institutions or enterprises from 16 to 20 April 2020 for the Census of Public Institutions. The purposes of the testing were to assess the newly introduced questions on smart-working, to identify problems related to communicating the meaning of the questions to the respondents, and to determine whether it was easy for respondents to answer. Due to schedule constraints, it was possible to engage only three respondents: two town clerks and the director of human resources of a region, all of them involved in smart-working decisions of their institution. Since there was also little time to develop a web questionnaire, we displayed the questions on a word file. The interviews were conducted via Google Meet, a video-conferencing system that affords the audio and video recording of the video call. This system is freely available for any web browser without installing software or registering an account. To engage in the videocall, the respondents had to click on the link sent by e-mail and allow the system to access the microphone and webcam of their device. Google Meet also allows respondents to participate in the interview in audio mode only, by dialing a phone number and a PIN code generated by the system. This possibility proved useful with one respondent who, due to connection problems, could not access the videocall but consented to the interview on the telephone.

During the online cognitive interviews, the interviewer shared the screen and gradually showed the questions to the respondent. The respondent could not take control of the questionnaire. Each interview lasted 30 minutes and was video or audio-recorded with the consent of the respondent. The interviewer shared the questionnaire and let the respondent read the questions to be tested and think aloud about the responses. The interviewer then followed up by probing for other information. Probes were written in the interview guide, but the interviewer was also free to ask emergent probes whenever it proved necessary. An observer monitored the interview while was taking notes about the respondent's reactions; at the end of the cognitive interview, the observer could ask retrospective probes about how the respondent had interpreted the questions and any difficulties she or he had in answering them.

Thanks to the cognitive interviews, we had drawn suggestions for the questionnaire design. Firstly, to avoid comprehension biases, we had to clarify the meanings of some vague words or expressions, such as "smart working initiatives". Furthermore, the reference period of some questions needed to be specified since referring to the "Covid-19 emergency period" was deemed too generic; it was better to indicate the period after 17 March, when the regulation on smart working in public administration has become more stringent. Lastly, some questions needed to be simplified, and others needed to be eliminated to reduce the response burden. For example, instead of asking the maximum number of employees who were in smart working during the Covid-19 emergency period, it was easier for respondents to provide the average number.

The Survey on Information and Communication Technologies Usage in Enterprises

The Survey on Information and Communication Technologies Usage in Enterprises will undergo a significant change due to the introduction of a new statistical unit, i.e., the Enterprise. According to Eurostat (EU Regulation 696/93 on Statistical Units), "an enterprise is an organizational unit producing goods or services which has a certain degree of autonomy in decision-making. An enterprise can carry out more than one

economic activity, and it can be situated at more than one location. An enterprise may consist out of one or more legal units". The cognitive pretest was part of a more extensive pilot study to assess the effects of this major change on the response process and response burden. We had to check whether respondents were likely to know the answer for all enterprises' legal units and access the required information. Overall, we conducted five interviews with ICT or accounting managers of enterprises. We chose the Whereby video-conferencing system, which does not need to download software or require respondents to register an account. At the request of the respondent, we carried out one interview via the Microsoft Teams system. After scheduling the interview, respondents were sent a reminder by e-mail with the link to participate in the video call.

Like Google Meet, also Whereby allows to record the call, but unlike the former, when the interviewer shares the screen, she or he can no longer see the respondent's face. This is an issue for a cognitive interviewer who should pay attention to non-verbal cues to know when to follow up with verbal probing. We solved this problem by having the screen shared not by the interviewer but by one of the other researchers participating in the video call. Since we had no time and resources to design a web survey, we prepared tailored slides for each enterprise, with the survey questions we wanted to test. Respondents were asked to read the questions displayed on the screen and to think aloud as they answered. The interviewer followed up with anticipated and emergent probes. Three thematic experts also participated in the interviews as observers and spoke when necessary to answer any respondent's clarification request.

Through an informal analysis of the cognitive verbal protocols, we managed to detect some questionnaire problems. Above all, there was a comprehension problem with the Enterprise word itself, the meaning of which was not always clear nor appropriate to map the different conditions of all the business group interviewed. Furthermore, the meaning of «ownership share» was often confused with «shareholding» or «percentage of control». Not all people recruited were the most knowledgeable respondents, since some did not know the data for all enterprises involved in the business group. It was also necessary to contact persons of different functions for the various legal units of the ENT, since these functions are not always centralized. Lastly, the new questionnaire included some additive questions that burdened in an unsustainable way the respondent task.

The Maritime Transport Survey

The Maritime Transport Survey is a census survey that provides statistics of goods and passengers carried on seagoing vessels for commercial purposes. In July 2020, since the data collection software had to be replaced, we proposed a change in the questionnaire structure to reduce response burden and increase data quality. While the old questionnaire asked for information by a different type of cargo, the new one asked for details by various ports of loading or unloading. In November 2020, some sections of the new questionnaire were subjected to a cognitive test to assess how this change affected the response process. We conducted five cognitive interviews with the shipping agents of Bari, Messina, Taranto, Reggio Calabria, and Naples. Our thematic experts selected all the respondents. We chose the Whereby platform to do the online cognitive interviews because it allows us to use the company brand and a customized subdomain (whereby.com/tramar_interview) and do not require registration or software download. Respondents had to fill out a web questionnaire, developed on Limesurvey software, whose link was available in the Whereby chat. They were asked to click the link and share their screen, read the questions displayed on the screen, and think aloud while answering. The interviewer then asked a standardized probe to follow up the spontaneous verbal protocol by respondents. A thematic expert also participated in the interview as an observer and intervened only to respond to any request for clarification by the respondent. The observer could also ask questions on emerging aspects during the interview. The interviews lasted about an hour and were video recorded with the respondent's permission.

The new questionnaire structure was found more accessible than the previous one. The main changes made after the interviews concerned the wording of some questions, where the adoption of expressions closer to the lexicon of the respondents made it easier to understand the questions "port of origin" was, for example, replaced with "port of provenance," since for shipping agents the origin indicates the port of the first departure

and not that of the previous stop. In addition, we decided to change the layout, or even the format, of some questions, as we noticed that respondents never selected "no" in batteries of questions posed as "yes/no".

Lesson learned for designing and conducting online cognitive interviews

Cognitive interviewing via a video-conferencing system is convenient both for survey organizations and for respondents. Since interviewers do not have to travel to meet with the respondents, survey organizations save costs and time. Furthermore, respondents may feel more comfortable when they participate online at a location of their choosing, typically from their home or office (Nehls, Smith and Schneider 2015). This also affords the flexibility to expand recruitment efforts (Mirick and Wladkowski 2019). In our experience, it was easy to reach people who are usually busy and challenging to engage in an in-person interview.

The ability to participate in the cognitive interview at their location may also provide respondents with increased privacy. As Hanna (2012, p. 241) claims, "both the researcher and the researched can remain in a 'safe location' without imposing on each other's personal space. For example, the researched can remain in the comfortable location of their home while being interviewed without the sense the researcher is encroaching on their personal space, while the researcher avoids the feeling of imposing themselves physically within the participant's personal space. Thus, a neutral yet personal location is maintained for both parties throughout the process". If respondents are at their location, they may feel more confident about the privacy and confidentiality of their answers; this is important when private information about an establishment or enterprise is to be gathered. In addition, if the room is quiet and there are no other people there, respondents have their eyes turned to the screen all the time, and this may focus their attention on the cognitive tasks required. However, the interviewer can always check if any disturbing factors can hinder the respondents' ability to think about their cognitive processes while answering.

We advise researchers not to involve too many people in the online cognitive interview. When there are too many participants, the respondent can confuse their roles and may not be clear who is conducting the interview. However, the presence of a thematic expert allows us to have a better dialogue with the respondent. Thus, the best solution could be to have the interview conducted by an interviewer with the support of a thematic expert in the role of the observer.

Building a rapport with respondents is also valuable, especially when they have to answer survey questions and provide information about their cognitive processes. Before the online interview, the researcher should phone or contact respondents via e-mail to give details regarding the cognitive interview and how to participate. The researcher should also reassure the respondent about the security of an interview via a video-conferencing system. In an interview with an establishment or enterprise, it can also be helpful to allow respondents to choose the video-conferencing platform they prefer to increase their willingness to participate. During the online interview, you must keep an eye on the respondent video to catch any signs of uncertainty, misunderstanding, or difficulty in answering. The connection should always be stable so that there are no interruptions in the communication, and the audio and video quality is to be high. In our experience, we had no difficulty building a rapport with participants, except when there were technical problems. The respondents seemed to enjoy this mode of interviewing and felt engaged in supporting the questionnaire design. However, this also had a side effect: having established a direct communication channel with the respondents, they felt entitled to use it for any request or complaint, even after the end of the interview and for other surveys.

Having the respondents share the screen and not the interviewer is also important. When the interviewers share the screen with the survey questionnaire to be assessed, they have the interview control; otherwise, the locus of control is in-between respondents and interviewers. This is also important for technical reasons: most video-conferencing platforms do not allow you to see your interlocutor while you are sharing your screen; but the ability to see the respondents while they're scrolling through the questionnaire and trying to answer the

questions is crucial. However, as Lo Iacono, Symonds and Brown (2015) say, most often than not, we can only see the face, missing essential cues from the rest of the body.

Online cognitive interviewing is especially suitable for detecting problems of web surveys. Thanks to the screen sharing, while respondents answer a web questionnaire, we can monitor how well they cognitively process information presented visually and navigate the instrument (Willis 2005). However, if we are interested in sources of response error independent of the web mode, we can always use a word file of the questionnaire, even if it is difficult to read and follow when there is a branch.

References

Bavdaz, M., Giesen, D., Moore, D. L., Smith, P. A., & Jones, J. (2019). **Qualitative Testing for Official Establishment Survey Questionnaires**. Survey Research Methods, 13(3), 267-288.

Beatty, P.C. & Willis, G.B. (2007). **Research Synthesis: The Practice of Cognitive Interviewing**, Public Opinion Quarterly, Volume 71, Issue 2, 287–311.

Geisen, E. & Murphy, J. (2020). **A Compendium of Web and Mobile Survey Pretesting Methods**. In Advances in Questionnaire Design, Development, Evaluation and Testing (eds P. Beatty, D. Collins, L. Kaye, J.L. Padilla, G. Willis and A. Wilmot).

Lenzner T. & Neuert C.E. (2017). **Pretesting Survey Questions Via Web Probing – Does It Produce Similar Results to Face-to-Face Cognitive Interviewing?** Survey Practice, 10 (4).

Meitinger K. & Behr D. (2016). **Comparing Cognitive Interviewing and Online Probing: Do They Find Similar Results?** Field Methods, 28(4), 363-380.

Mirick, R.G. & Wladkowski, S.P. (2019). **Skype in Qualitative Interviews: Participant and Researcher Perspectives**. The Qualitative Report, 24(12), 3061-3072.

Sudman, S., Willimack, D.K., Nichols, E. & Mesenbourg, T.L. (2000). **Exploratory Research at the U.S. Census Bureau on the Survey Response Process in Large Companies**. Proceedings of the Second International Conference on Establishment Surveys, American Statistical Association, 327–337.

Tourangeau, R. (1984). **Cognitive Sciences and Survey Methods**. In Cognitive Aspects of Survey Methodology: Building a Bridge Between Disciplines (eds. T. Jabine et al).

Willimack D.K. & Nichols E. (2010). **A Hybrid Response Process Model for Business Surveys**. Journal of Official Statistics, Vol. 26, No. 1, pp. 3–24