



COGNITIVE INTERVIEWING PRACTICE



EDITED BY
DEBBIE COLLINS

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COGNITIVE INTERVIEWING PRACTICE



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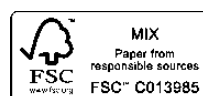
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NATCEN SOCIAL RESEARCH

NatCen Social Research is one of Britain's largest and leading independent social research organisations. It was established in 1969 and is registered as a non-profit, independent educational charity. NatCen Social Research has a staff of around 200, with offices in Edinburgh (ScotCen Social Research), London and Essex. It carries out quantitative and qualitative research across all major social policy areas. NatCen Social Research specialises in the development and application of rigorous social research methods with work commissioned by central government departments, public bodies, and funded by research councils and grant-giving foundations. Our staff share their expertise through NatCen Learning. NatCen Learning supports skills development and capacity-building across the research sector through a programme of short courses, consultancy and research support. We provide training and learning for external organisations and researches working in government, academia and other settings.

In 2006 NatCen established a specialist Questionnaire Development and Testing Hub. NatCen Social Research has for many years utilised qualitative research methods in the design of surveys and was one of the first survey organisations in the UK to embrace cognitive interviewing methods to evaluate questionnaires. The Hub brought together these two disciplines, creating a centre of expertise. The Hub works with a wide range of organisations to help them improve their communications and data collection tools with their stakeholders, members of the public and survey participants through the application of good design principles and rigorous testing and evaluation.

All the authors are current members of NatCen Social Research and are committed to improving the communication of information and the robust measurement of social phenomena through survey questionnaires.

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PREFACE

The motivation for writing this book is a desire to share the learning and experience we have acquired together over the years, testing survey questions and other materials. We wanted to write a book that is primarily concerned with practice: how you undertake cognitive interviewing. This book reflects the practices that we have developed in our day-to-day work and which are reflected in the courses we run, through NatCen Learning, for a wide range of people who want to understand and use cognitive interviewing – be they students, practitioners or commissioners.

There are several excellent books concerned with cognitive interviewing already available. Gordon Willis' book *Cognitive Interviewing: A Tool for Improving Questionnaire Design* is concerned principally with the interviewing process and describes in some detail the probing technique. Other elements of the cognitive interviewing process – sampling and recruitment, data management, analysis and using findings to make recommendation are not discussed in any great detail (Willis, 2005). Miller et al.'s *Cognitive Interviewing Methodology* puts forward the case for cognitive interviewing as a tool to evaluate the validity of survey concepts and constructs, with cognitive interviewing seen as a tool that can be used to explore the way in which participants and researchers construct meaning (Miller et al., 2014). However, neither of these offers a step-by-step guide to the design, conduct, analysis and use of cognitive interviewing findings to 'repair' survey questions that are not working as intended. Nor do they focus on the practical, pragmatic decisions that often face the question tester who is working in an applied social policy/national statistics environment where time and money are in short supply.

The aims of this book are to provide you, the reader, with:

- a) An overview of the cognitive interviewing method, its origins and the theory that underpins it
- b) An appreciation of what the method can and cannot do, when to use it and how it can be combined with other pretesting methods

- c) Guidance on how to design, conduct, analyse and report on cognitive interviews
- d) Ideas and tips on how to use the method in particular circumstances, i.e. in testing questions for inclusion on mixed-mode or cross-national surveys, or when using the method to test other kinds of documents designed to convey and or collect information from people.

This book is divided into three parts: Part I is concerned with (a) and (b) above, providing you with an overview of the origins and theoretical underpinnings of cognitive interviewing (Chapter 1); and of other pretesting methods (Chapter 2).

Part II is concerned with (c) above, providing a step-by-step guide to the planning (Chapter 3), sampling and recruitment (Chapter 4), interview protocol development (Chapter 5), interviewing (Chapter 6), data management (Chapter 7), analysis (Chapter 8) and application of findings (Chapter 9).

Part III is concerned with (d) above: providing guidance and tips in the use of cognitive interviewing to test survey questions designed for different modes (telephone, mail, web) and for mixed-mode surveys (Chapter 10); in cross-national, cross-cultural and multilingual settings (Chapter 11); and for testing other kinds of survey materials (Chapter 12).

Throughout the book we use examples, the vast majority from our own work, to illustrate our points. Much of the work we do is commissioned by research funders, typically government departments and their agencies, though we also carry out research for public, voluntary and private sector organisations and research councils. We use cognitive interviewing and other pretesting methods as part of the questionnaire development process but also to evaluate existing survey questions. In much of our work the output is a set of recommendations on the future wording (and design) of the test questions. In this book we illustrate how you can move from findings to recommendations (Chapter 9) and the trade-offs that may need to be made: a step that is rarely discussed in the literature.

The majority of the survey questionnaires we design and/or test are surveys of individuals and this is reflected in this book. The use of cognitive interviews to test business survey questions requires some additional considerations and we provide an overview in Chapter 3. However, if you are interested in this area then we strongly recommend that, in addition to reading this book, you refer to texts that focus on business surveys, such as Snijders et al. (2013).

This book is the distillation of the knowledge and experience of many people, however, and we would like to acknowledge former colleagues who have worked with us on projects cited in this book: Fiona Andrews, Meera Balarajan, Hayley Cripps, Kate Green, Sophie Green, Curtis Jessop, Avneet Johal, Robin Legard, Hayley Lepps, Matthew Hall, Alice McGee and Joanne

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We'd like to acknowledge our collaborators on cognitive interviewing projects: Amanda Wilmot at RTI International; Rory Fitzgerald, Sally Widdop and Lizzy Gatrell at the Centre for Comparative Social Surveys (CCSS), City University London; Pam Campanelli, The Survey Coach; and Noah Uhrig at the Institute for Social and Economic Research, University of Essex.

We also owe thanks to the members past and present of QUEST – the international working group on QUestionnaire Evaluation STandards – for their ideas, encouragement and support of our work and to Gordon Willis for his comments on this manuscript. We are grateful to Jane Ritchie, Jean Martin and Roger Thomas who shaped and encouraged our passion for good questionnaire design. And finally we are indebted to Pam Campanelli and Graham Farrant, who founded the cognitive interviewing tradition at NatCen back in the 1990s and were part of a small group of practitioners who pioneered the use of cognitive interviewing methods in questionnaire development in Great Britain.

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PART I

BACKGROUND AND CONTEXT

ONE

COGNITIVE INTERVIEWING: ORIGIN, PURPOSE AND LIMITATIONS

DEBBIE COLLINS

1.1 Introduction

The aims of this chapter are to provide you with an overview of the cognitive interviewing method and to illustrate how it can be useful to you in the development of a survey questionnaire. Specifically we will:

- Summarise the theory behind the method
- Set out its origins
- Describe the method and the interviewing techniques it uses
- Examine its limitations.

Let's start by considering the purpose of a survey and the factors that can affect the data it produces.

A "survey" is a systematic method for gathering information from (a sample of) entities for the purpose of constructing quantitative descriptors (statistics) of the attributes of the larger population of which the entities are members. (Groves et al., 2009, p.3)

We carry out surveys because we want to find out information about the population of interest, and we want that information to be statistical so that we can answer questions such as how many, how much, of what strength and size? We

want this information because it is needed by policy-makers and decision-makers in government (national and local) and organisations such as health authorities, service providers and advocacy groups to inform decisions about issues that affect citizens, service users and so on. And we collect this information typically by asking people questions.

There are many factors that can influence the accuracy of the statistics collected by a survey. These include:

- Sample design and implementation – for example the completeness of the sampling frame and how well the responding sample covers the target population.
- Data collection – for example the mode of data collection, the characteristics of the interviewer, the environment in which the interview takes place or the questionnaire is completed, and the design of the questionnaire.
- Data processing – for example how the data are edited and coded.

These factors can introduce errors and biases to the data collected, which can impact on the accuracy of the statistics generated by the survey (see for example, Biemer and Lyberg, 2003; Groves et al., 2009; Oksenberg et al., 1991).

In this book we are concerned with errors that can arise during data collection when asking people questions. The survey method is underpinned by the premise that if we use standardised tools and standardised procedures in collecting our data, we will be able to observe real differences between participants. By ‘standardised tools’ we mean questionnaires that determine the exact form of the questions to be put to each participant. By ‘standardised procedures’ we mean training interviewers to only read the questions exactly as worded, to use neutral probes, and so on (Fowler and Mangione, 1990).

However, standardising the questions asked may not on its own ensure that we obtain valid, reliable, unbiased, sensitive data (Fowler, 1995). One obvious problem is that participants may not understand the questions being asked of them – or not in the way that the question-designer intended.

Given the challenges posed by the question design task, as designers we need feedback on how well we are succeeding. Ideally, feedback is required *before* the main survey is committed, so that attempts can be made to improve questions that do not seem to be performing as they should. Fortunately, methods exist for checking whether or not the questions can be answered, and whether the response task is being interpreted and carried out in the way intended before a questionnaire is finalised. One of those methods is cognitive interviewing.

1.2 Understanding the question and answer process

Cognitive psychology provides a useful model that can help us understand how participants answer survey questions. In its simplest form the model specifies

four distinct processes that must be completed in order to answer a question. Participants must:

- (a) comprehend the question;
- (b) retrieve the necessary information (usually from long-term memory);
- (c) make a judgement about the information needed to answer the question; and
- (d) respond to the question. (Tourangeau, 1984)

In many real-life situations the question-and-answer process is probably not a simple linear progression but rather involves numerous iterations of and interactions between the different phases, as shown in Figure 1.1. For example, participants may make judgements at (C) about the level of detail needed to answer a survey question based on how difficult it is to retrieve the information required (B) and/or by the way in which answers are to be reported or the answer categories provided (D). This may then cause them to review (A). For example, is the question asking for the exact number of occasions I visited my doctor in the past six months, or is it asking for an indication of frequency – none, between 1 and 5, 6 or more? Having arrived at a provisional response at (D), I may then review it for social acceptability before actually reporting it. For example, will I appear out of the ordinary if I give the answer I am minded to give?

What has been said so far covers interviewer-administered questions. When the questionnaire is in a self-completion format, the question-and-answer process

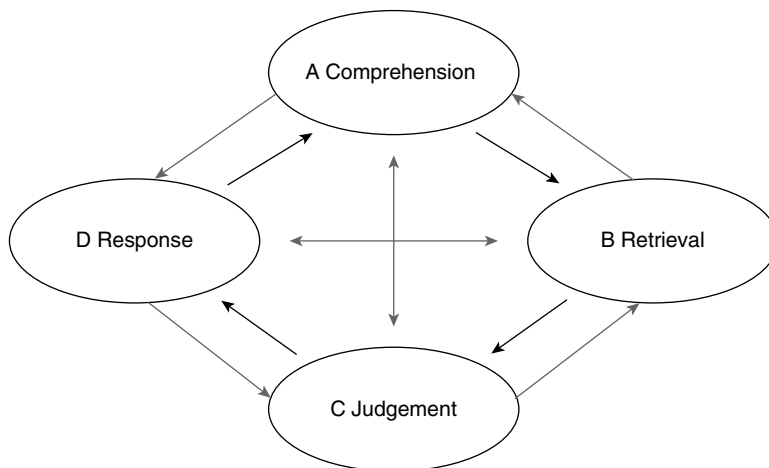


Figure 1.1 Elaborated question and answer model

Based on Tourangeau's 1984 Four Stage Question and Answer Model. Created by Debbie Collins.

contains two additional stages: firstly participants have to perceive the information being presented to them (i.e. they have to recognise that this is a questionnaire that they need to complete); and secondly they have to comprehend the layout of the questionnaire: the visual aspect. Then they have to go through stages (a) to (d) above, and finally comprehend the routing to the next question. For further information on the cognitive steps involved in the question-and-answer process for self-completion questionnaires, see Jenkins and Dillman (1997).

Let us now look at each of the four main stages in the question-and-answer process in a little more detail.

1.2.1 Comprehension

There are a number of comprehension issues that you need to consider when designing and testing a survey question.

- Does the participant fully understand how the question is structured (syntax) and the vocabulary used?
- Is the participant able to keep all of this in mind when formulating an answer to the question?
- Does the participant understand the question in the way the researcher intended?

This last point is important because if participants interpret the questions in a different way from the way you intended as the question designer, conclusions drawn based on these answers may be flawed. Worse still, if different participants interpret the question in different ways from each other, and from what the researcher intended, comparisons between participants' answers will not be valid. This is a problem because it can introduce systematic bias into survey estimates if certain types of participants interpret the question in particular ways.

Your goal is to design a question that can be understood by all participants, in the same way, and in a way the researcher intended. However, this is more difficult than it might first appear because the meaning of a question has two components – literal and intended. Literally understanding the words is not sufficient to be able to answer the question. Consider the following question and its use as an indicator of social inclusion

'How strongly do you feel you belong to your immediate neighbourhood?'

The question's intended meaning is to ask whether the participant feels part of his or her community. However, when participants interpret the phrase 'belong to' literally as being 'the property of', the question becomes difficult to answer. Focusing on the literal meaning is something that is seen among children and people whose first language is not that used by the questionnaire. A clearer wording of the question might be:

'How strongly do you feel you are part of your immediate neighbourhood?'

How participants interpret such a concept within a question will depend on the context in which the question is asked, with participants drawing on the assumptions that are unthinkingly used in conducting daily conversation. This is because we often draw upon our stock of background information and knowledge in interpreting text, which means we will often fill in gaps, add details and make inferences based on our background stock of knowledge and what the survey interview requires (Grice, 1991).

1.2.2 Retrieval of information

Having comprehended the question the participant then (usually) has to retrieve the relevant information – be it factual or attitudinal – from long-term memory. This depends on the way in which the memory is stored or 'encoded' by an individual participant. In the case of factual information – either current or historical – a number of factors may affect the retrieval process.

Firstly, if the retrieval context is different to the original encoding context the participant may not be able to recognise that the event took place or be able to recall the correct event (Tulving and Thomson, 1973). Secondly, the rarer or more distinctive an event is, the more likely participants are to remember it. Consequently similar, commonly occurring types of event such as routine journeys or interactions will be harder to distinguish and recall individually (Anderson, 1983). Moreover, over time participants are likely to have experienced more similar events, so that rare or more distinctive events will become scarcer. This means that accurate recall (memory) of many events will become more difficult because there are fewer distinctive events, see Example 1.1 (Gillund and Shiffrin, 1984; Johnson, 1983).

Example 1.1 Remembering commonly occurring events

Remembering details about what I did on my first day at work in my current job diminishes the longer I am in my current job because I have more memories of work days featuring similar activities from which to select my first day.

Finally, often details are lost in the encoding process and inferences and interpretations are added. This can result in individuals 'recalling' in all sincerity events that did not actually occur. Such inferences may be added in response to the retrieval context, for example inferring the severity of damage sustained by a vehicle in a car accident from how the accident was described by the questioner rather than recalling the film footage of the accident (Loftus and Palmer, 1974).

In summary, there are several processes involved in the retrieval of factual information, including: adopting a retrieval strategy; generating specific retrieval cues to trigger recall; retrieving individual memories; and filling in partial memories through inference (for example, ‘what I must have done is...’). Certain characteristics of the question and the material retrieved from memory can affect the completeness of the retrieval phase.

Attitude questions collect subjective information about opinions, values, beliefs and norms. Tourangeau et al. (2000) argue that attitudes have a memory structure that contains existing evaluations, vague impressions, general values, and relevant feelings and beliefs. When participants think about an issue on any given occasion, they will draw upon a subset of these contents. Depending on the requirements of the question and what is recalled, an existing evaluation may be reported, updated, refined to cover the new situation or discarded and an entirely new view formed. They contend that the type of information drawn upon by participants when answering attitude questions depends both on its accessibility and how motivated participants are to produce a ‘defensible position’.

When testing attitude questions it is therefore important to explore reasons for confusion around, or inability to answer, particular questions: are the problems participants are having to do with confusion about the wording of the question or is there evidence to suggest that participants simply do not have a view on the topic or do not hold a strong attitude about what was being asked about? Is the task too complex – is forming a view difficult because of the amount of material that needs to be considered (for example, because this is not an issue the participant has thought about before)? Does the mode of data collection help or hinder the formulation of an answer?

1.2.3 Judgement

In designing a survey question, you assume that participants can provide the information being requested. This assumption, however, may be flawed because:

- the information being sought is difficult to recall accurately (such as dates or frequencies);
- what can be recalled may be incomplete (such as recalling the details of a particular event); or,
- in the case of attitude or opinion questions, the question is asking the participant to express a view or opinion on something which they may not have thought about (for some time), or in that context.

Judgement can therefore be seen as the process by which participants formulate their answers to a survey question from the ‘raw material’ that they have retrieved from memory. This process involves participants considering, for example, whether they understand the question, whether the question applies to their

situation, whether it is asking for information they have, how detailed this information needs to be, how accurate it needs to be, whether they need to modify their answer to meet the perceived needs of the question, and so on. These judgements may be made at any stage during the question-and-answer process, and can inform the comprehension, recall and response phases (see Example 1.2).

Example 1.2 Judgement

In being asked a question about how many times I have visited a doctor in the past six months, I may refine my comprehension of the terms 'visited' and 'doctor' in light of my first recall attempt. I may tighten or loosen my definitions depending on how easy it has been to retrieve the information required. I may consider that if I am having difficulty recalling the event then perhaps it happened infrequently. Alternatively I may be uncertain of the exact dates and thus make a judgement about whether I think the events I can remember happened within the reference period or not.

Judgemental short cuts

Cognitive 'short cuts' or heuristics are often used by participants when formulating answers to questions about the frequency of events or behaviour. This is because memory is not perfect and decisions often have to be taken about how to compensate for incomplete or inaccurate information. For example, research has shown that the number of items to be recalled is the most important factor in determining whether the participant will adopt a counting or estimating strategy in order to give an answer about frequency (Blair and Burton, 1987; Sudman and Schwarz, 1989). A number of different strategies for estimating answers to frequency questions have been identified and can be classified as follows:

- enumeration, or counting up, of specific events (for example counting up the number of sessions of exercise done in the last week);
- estimation based on recall of summary information about the rate of occurrence of the event;
- recall of an exact count or tally of events (for example remembering the exact number of pregnancies ever had); and,
- estimation based on a general impression (Tourangeau et al., 2000).

An alternative classification of how participants answer 'frequency' or 'amount' questions is based on the work of Tversky and Kahneman (1973, 1974). They consider how available the information is to the participant (ease of recall), how representative the information retrieved is of the 'normal' state of affairs, and the use of context to anchor-and-adjust the answer (see Example 1.3).

Example 1.3 Judgement short cuts

For example, in answering the question ‘How many hours did you work last week?’ participants could opt for an easily available answer such as their contracted hours. Alternatively participants may feel that their contractual hours are not representative of the true hours they work, and thus they may decide to average out the hours they worked over a number of weeks. Finally, participants may take their available or representative answer and adjust it in light of the survey context, the answer categories provided or the special circumstances of last week.

1.2.4 Response

The final task described by the question and answer model is the response stage. There are two components involved in responding to the question: formatting and editing the response (Tourangeau et al., 2000), and these two stages are described below.

Formatting the response

The response-formatting process is needed when a closed answer is required, with the predefined answers having already been designed by the researcher. The participant has to fit her or his answer into one of the categories provided. For example, the following pre-specified answers could be offered for the question ‘How often do you exercise regularly?’

Everyday
 Every other day
 At least two or three times a week
 At least once a week
 Less often than once a week
 Never

As the question designer, your choice of response alternatives may affect the way in which participants comprehend the question and the recall and judgement strategies they use. For example, the pre-specified answers provided for the question above about the frequency with which people exercise could influence the participant’s answer by implying that it is common for people to exercise at least once a week. This is because only two of the six answer options provided refer to exercising less often than once a week, and one of those options is never exercising. This may suggest to participants that, whatever is meant by ‘exercising’, the majority of people do it quite often. Thus they may use this inference to anchor and adjust their own answer to the question. A further problem here, of course, is the lack of a clear definition of ‘exercise’.

Editing the response

Participants may want to edit their answers before they communicate them because they may want to conform to notions of social desirability (Couper and Groves, 1992) and self-presentation (Goffman, 1959). These effects may be more profound in face-to-face interviews than telephone or self-completion data collection methods because social effects are more intense in a face-to-face situation (Green and Krosnick, 1999).

The impact of social desirability factors on response is often limited to questions perceived by participants as being sensitive and potentially threatening. What constitutes a sensitive or threatening question and therefore is considered socially desirable, will depend on the survey context – the mode of data collection, the characteristics of the interviewer and participant, who else is present when answers are given, apart from the interviewer, the content and purpose of the interview, and so on (Krueter et al., 2008; Lind et al., 2013).

1.3 Application of the question and answer model

Things can go wrong when participants are unable or unwilling to perform one or more of these tasks. Applying the question and answer model described in section 1.2 is useful in helping you to identify the aspect or aspects of the question that are problematic. Let's consider the following example, Example 1.4.

Example 1.4 Identifying cognitive problems with questions

How many pints of beer did you drink in the 7 days ending yesterday?

If a participant were to be asked the above question by an interviewer as part of a health survey, the following might be the thought processes that she goes through in formulating her answer.

OK, this question is asking about pints of beer I drank last week. Right, let me think. Last week. Did I go out last week? Yes, I went to the pub with some people from work last Thursday.

What did I drink? Shandy [beer mixed with lemonade], I didn't want to get drunk. I was drinking halves. No, that's not true; I bought a pint when I arrived, then two more halves I think.

Um, now the question asks about pints of beer, does that include shandy? No, I don't think so.

Then Saturday it was Sarah's birthday and she had a party. I had a few bottles of beer there, but I can't remember how many I actually drank. I

(Continued)

(Continued)

got fairly drunk. I kept putting one down to go and dance and would come back and find it had gone. I probably opened about ten but I don't think I drank that much. Let's say I drank five.

Now how much is in a bottle, less than a pint? I think it's a half-pint. Oh this is hard work! Then I had a few beers on Sunday, in the pub watching the football. I probably had about four pints, I usually do. Right so that's six-and-a-half pints. Oh and I went out Friday night and had a few beers then, four or five pints I think. So that makes ten-and-a-half pints.

Gosh that sounds a lot. I don't usually drink that much, do I? No, I think it's more like four or five pints. I don't want to sound like I'm an alchie. I'll say four.

Let's evaluate what went on here by applying the question and answer model. The model indicates that the first thing the participant has to do is to comprehend the question. Our participant does this. She thinks about the beer that she drank last week, outside the home. She thinks about occasions when she had been out over the past week and whether she drank beer. She did not appear to consider any beer she might have consumed inside her home. She imposed this definition; it was not part of the question wording. Furthermore, the term 'beer' caused her a problem, as she was not sure whether shandy (beer mixed with lemonade) should be included or not. She decided to exclude it.

The model suggests that having understood the question participants have to recall the information required to answer it. In this example the participant started to think back over the course of the last week about times she had been out. Her interpretation of the question, thinking about beer consumed outside the home, impacted on the way in which she recalled the information. She was only recalling events involving being out and drinking alcohol. Her recall was hindered at times by the fact that she could not accurately remember how many 'pints' of beer she had drunk on each occasion. This was partly related to the units in which she was drinking on a particular occasion not being the same as the units being requested in the question. For example, she was drinking bottled beer at the party, not pints. Also there was a difference between how many beers she bought or was given and how many she actually drank. For example, she estimated she drank half the beers she started at the party.

At times the participant was not able to recall exactly how many beers she drank and so she made a judgement about how to deal with this imperfection in her memory. In some cases she estimated (based on the number of times she