

Evaluating compliance with the Computer Assisted Randomised Response
Technique
A qualitative research into the backgrounds of lying and cheating

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Abstract

In this paper we present the results of a qualitative study into the motives of respondents to give social desirable answers and/ or cheat on the rules when filling out a computer assisted randomized response questionnaire. Eighteen respondents, all social services clients, answered twelve sensitive questions using a computer-assisted questionnaire. The forced response method was used as the randomized response technique. Afterwards respondents were interviewed about their experiences. All respondents reported having trouble giving forced answers and, as a consequence, some cheated on the method. Some respondents gave social desirable answers. Their motivation for giving evasive answers was that the perceived risk, capping of their social benefits, was too big to comply. This knowledge is used to formulate recommendations to improve computer assisted randomized response questionnaires.

Keywords: Computer Assisted interviewing, Randomized Response, Forced Response, non-compliance, Qualitative research, social desirable answering bias, sensitive topics

Introduction

Randomized response techniques

In this paper we will present the results of a study into the possibilities of using the randomized response technique in a computer assisted interview environment. When sensitive or incriminating topics are studied researchers are often confronted with high rates of non-response and data distortion by socially desirable answering (Lee, 1993). Sensitive questions encompass several aspects that make them prone to these errors. Their content is often perceived by respondents as an invasion of their privacy, respondents anticipate the risk of disclosure of their answers to third parties, and the answer can be perceived as socially undesirable (Tourangeau, Rips, and Rasinski, 2000).

To improve the accuracy of answers to questions on threatening topics Warner (1965) developed the randomized response technique (RRT). The use of an RRT prevents against privacy violation and in doing so diminishes the need to give socially desirable answers.

The crux of this technique is that the data are deliberately contaminated with random error, by introducing an element of chance. In this study we used the Forced Response method (Boruch, 1971). A respondent gets two dice, when he throws 2, 3, or 4 he /she is asked always to answer 'yes' independent of his or hers true answer to the question. When a respondent throws 11 or 12, he is asked to answer 'no' independent of his or hers true answer to the question. But when he or she throws 5-10 an honest answer to the sensitive question should be given. It is explained to the respondents that researchers can never know if a 'yes' answer is the result of a true yes or the result of the dice showing up at 2, 3, or 4. This way their privacy is always protected even against legal prosecution (Fox & Tracy, 1986). And although the individual 'yes' becomes without meaning we are still able to compute the population estimate of the sensitive topic, and when we use a logistic regression approach we are even able to link these sensitive behavior estimates to explanatory variables (Van der Heijden, en van Gils, 1996; Maddala, 1983; Scheers en Dayton, 1988).

Qualitative research on the assumptions of Randomized Response Techniques, 08-01-03

A meta-analysis of empirical randomized response studies for the time-period 1975-2000, showed that the RRT resulted in significantly more valid population estimates than the standard data collection methods did (Lensvelt-Mulders, Hox & van der Heijden, forthcoming). This was even more so when the research topic became more sensitive.

However the RRT does not always result in completely valid population estimates (Van der Heijden, van Gils, Bouts & Hox, 2000). Explanations for discrepancies between the true population prevalence of a sensitive attribute and the randomized response population estimate should be sought in non-compliance with the method. Firstly, it is possible that respondents do not give forced 'yes' or 'no' answers when they are forced to by the dice. Not following instructions when 2, 3, 4, 11 or 12 are thrown will be further called *cheating*. Secondly, respondents can refuse to answer truthfully when asked to. To distinguish this from cheating here it will be called *lying*. Although both types of non-compliance are important for understanding the RRT from the respondents' perspective, only a few research papers could be found that addressed this problem (Clark & Desharnais 1998; Soeken & Macready, 1982).

Furthermore it is true that the positive effect of RRT is significant but it is also small, and the results proved to be very heterogeneous across studies. After the analysis of 35 studies we were left with a significant proportion of unexplained variance. From these results it was concluded that RRT has its merits, but that this technique is still not under adequate research control. The question becomes then: 'is it opportune to further develop RRT, or are there other more promising methods to solve the problems associated with sensitive topics (high non-response and social desirable answers) and is it time to discard RRT?'

Nowadays one of the mainstream solutions to the sensitive topic problem is the use of computer assisted interviewing (CAI), with audio-CASI as last development. The use of computers as a mode for data collection has multiple advantages. I will not list them all, for an overview on the advantages of CAI on data quality one can read De Leeuw, Hox, and Snijkers (1998). One of the advantages that I do want to bring in mind is the increase in the respondent's perception of privacy protection that comes with computer assisted interviewing, and that can lead to a greater self disclosure (Aquilino, wright and Supple, 2000). The main assumption of RRTs is that increased privacy protection will lead to honest answering. CAI also provides an increase in privacy protection, and moreover it is also much cheaper and more efficient than using an RRT. Does this mean that using CAI will supersede the need for randomized response techniques?

There are three reasons why this is not the case:

Firstly, using the computer will slowly loose its magic because they become more common tools. Even individuals who do not work professionally with computers are getting acquainted with its (im)possibilities and features. More and more information is collected and recorded in large databases. In the media respondents are confronted more frequently with negative messages of misuse of these databases, like the selling of information to third parties, and the merging of data files by different organizations. And although these messages are not about data from scientific research, in the long run this can /will influence the trust of respondents in guarantees of their privacy. Using a method that can objectively prove that it can protect respondents' privacy will then become more advantageous. Secondly, the expected increase in Internet surveys will also warrant the use of RRT, because large samples will become easier to approach. Furthermore also on the www privacy protection will become an issue. When a respondent fills out a questionnaire using the www he will become traceable. Even when this is very difficult, news items about police actions against for instance people who put pornography on the Internet, will negatively influence trust in privacy protection. So also for www interviewing a method that objectively guarantees privacy can become advantageous.

This brought us to the conclusion that looking at the future of sensitive survey research the best strategy will become the combination the best of both worlds, computer and RRT, into a new approach that we called computer assisted randomized response or CARR.

The objective of this study is to gain insight in how respondents participate and deal with the computer-assisted RRT and - based on the outcomes - how the CARR design could be improved. The focus of this study was on three areas:

- 1) experiences of the respondents with using RRT in a computer assisted environment;
- 2) how can we prevent cheating;
- 3) how can we prevent lying.

The insights we obtain in these three areas will be used to identify ways to improve CARR questionnaires and bring them under better /sufficient researchers control.

First, we will describe the research methods. We then present the results and continue with conclusions and recommendations.

Methods

Cognitive laboratory methods

For these purposes, a so-called cognitive laboratory approach was used. Cognitive laboratory settings are well-known for pre-testing survey questions but are less often used to evaluate complete data collection methods (Campanelli, Martin & Rothgeb, 1991; Campanelli, 1997; Snijkers, 2002). These methods contribute to an understanding of the psychological processes that guide decision making in the question-answer process, and in this study it is also used to gain knowledge on the extra steps in the information processing model necessary to perform an RRT (Bryman, 1992). We used the instruments of video-taping and indepth interviewing. Respondents where video taped with their permission.

Two researchers observed the respondents by means of video as they filled out the questionnaire. Notes were taken on the respondent's behaviour; in particular, the time needed to answer a question, sighing, reading aloud, whether the dice were thrown more than once and whether the instructions were followed. These notes were used to stream the qualitative interview held afterwards to learn how the respondents interpreted the RRT and formulated their answers (Weiss, 1994). The interviews were audio-recorded. The two researchers took turns interviewing the respondents, while the other one followed the interview on video. The two sources of data, interviews and video recordings, served for data triangulation (Seale, 1999). We have considered the use of a concurrent think aloud protocol but it was decided that thinking aloud would interfere too much with the feelings of privacy protection that should be evoked by using CARR

Respondents

Twenty-one respondents were recruited from the files of the Department of Social Services of the city of Amsterdam, the Netherlands. Three respondents decided not to participate and did not show up at the appointment. The aim of this study was described to the respondents as an attempt to improve a computer assisted randomized response questionnaire concerning information that people find difficult to reveal.

Respondents were between 21 and 63 years of age, and half of the respondents were over 45 years. Twelve females and six males co-operated. All respondents had received social security benefits for over one year, and half of them have been receiving social benefits for more than ten years. Therefore, it could be assumed that they were acquainted with the regulations concerning the right to social security benefits.

Respondents had almost no vocational education and /or limited labor experience. The combination of these factors makes their chances on the job market very small, and increases their dependency on welfare. Twelve respondents had none or only very limited experience using computers. The other six were familiar with computer use. Four respondents worked laborious with the computer during our session.

Sensitive questions

The sensitive questions that the respondents had to answer concerned their appliance with regulations that are associated with the right to obtain social benefits. Not following these regulations is punished with a cut down of one's social benefits. Revealing information about regulation following is threatening in two ways. Firstly it can have large negative consequences for one's monthly income and there is even the risk for legal prosecution and punishment. Secondly even if an individual respondent has never made false claims or broken any regulations, a larger population estimate of the sensitive behavior can have negative personal consequences, like more frequent controls and negative publicity about the social group. To illustrate the questions here are two examples: "Have you ever provided incomplete or incorrect information to the Social Services about additional income that you received?" and "Do you have a car which is worth new more than 15.000 Euros?"

Research design

The study was carried out in two phases. The first phase took place in December 2001 and eleven individuals participated. The second phase took place in February 2002, seven participants joined the experiment. Both rounds of data collection were carried out at the NIPO, Center for Market Research, in Amsterdam¹.

All respondents had to finish a computer assisted randomized response survey that consisted of twelve questions. In the first phase of the study these questions were divided into two blocks of six questions each. In one block of six questions, two real dice were used as randomizer, in the other block there were six different questions, which had to be answered using computer animated dice. These two blocks of six questions were presented to the respondents in random order. In the second phase all 12 questions had to be answered using the computer animated dice.

Before respondents started filling out the questionnaire using the RRT, the researcher described the method to the respondent. This description was intended to increase the respondents' understanding and trust in the method (Landsheer, van der Heijden & van Gils, 1999; Boeije and Lensvelt-Mulders, 2002). In the second round this introduction was briefer, since it was assumed that individuals who would use CARR in the future, would not be given an extensive oral introduction, because CARR will among others be used in an access-panel environment. The respondents were instructed to use two dice to randomize their answer pattern. They were told that when they would throw 5, 6, 7, 8, 9 or 10, they had to answer the question truthfully. When they would throw 2, 3 or 4 they had to answer "yes" and in the case of 11 or 12, they had to answer "no", independent of their true status on this topic. These instructions were repeated on the computer after every question and in the first phase of the study also a paper copy of the instructions was placed beside them. For some respondents, it appeared necessary to explain the use of the computer since they had never used one before. Respondents only had to use three keys: 1 (= yes), 2 (= no) and enter (to continue and to manipulate the dice).

Before the respondents started to answer the survey questions, three trial questions were programmed so that the respondent could practice with the method. The trial questions were: "Have you read a newspaper today? Did you drive through a red traffic light last week? Did you use public transportation without a valid ticket last month?"

Data analysis

The analysis of the interviews consisted of two steps that kept each other in equilibrium, namely fragmenting and connecting (Dey, 1993). In the first step the component parts of each interview were separated into categories and labeled with codes. This involved listening intensively to the tapes of the interviews. For brevity's sake, the interviews were paraphrased and only relevant parts were transcribed. Categories such as "cheating" and "lying" were clearly defined by the theoretical framework, whereas "lucky hand" and "forced dishonesty" emerged from the data. Later on, we began to place the codes into what we felt to be the major categories, namely "doing RR" and "the meaning of honesty". One researcher [HB] conducted the first phase of open coding and both researchers discussed the final analysis.

The second step in the analysis process consisted of interpreting the parts as a whole and connecting the pieces of one case together. An interpretive reading of the interviews was conducted, calling for our active involvement in inferring meaning from the data (Mason, 1996). For example, respondents mentioned that "they were lucky" or "they had thrown well" and explained that this meant they were allowed to give their own answer. From this it was concluded that respondents, who presented themselves as persons who did not break the regulations, were irritated when they had to admit that they committed unlawful behavior that they did not do when the dice forced them to.

Results

Operating the computer

All respondents found the RRT instructions on the screen clear and they were able to finish the questionnaire without help. Nevertheless, one respondent interpreted the instructions incorrectly and gave forced confirmative answers when he threw from two to ten, instead of two to four.

The views on computer assisted interviewing differed among our respondents. On the one hand, some respondents thought that a computer would not encourage telling the truth, whereas a face to face interview was more likely to evoke a truthful answer:

"It is equipment language: it is yes or no. When you talk to someone you can elaborate. I'm not happy about the black and white, cause life is not black and white". (R9)

On the other hand, more respondents persisted that it felt more private to work with a computer and that it helped them to fill out the questionnaire honestly.

Respondents also associated CARR with doing two things at the same time. They needed more time, up to thirty seconds, when their own answer had to be changed as a consequence of the dice forcing them to give a specific answer. As one respondent explained:

"Actually, you are doing two things at the same time. You are throwing dice and you are busy with the questions. And they are both equally important. And sometimes I forgot the question by doing so and then I had to read it again". (R1)

It became clear from the interviews as well as from the video recordings that our respondents developed a strategy of reading the question first. Then they formulated an answer in their head, and after that they checked the results of the randomizer to see if this was the answer they had to give or that a forced 'yes' or 'no' was expected. As a consequence of the extra act in RRT, it is more difficult than finishing a standard questionnaire. One should remember that most of our respondents did not receive much formal education, had not been part of the labor force for years and sometimes lead an isolated life. Being on

social services has made some of them insecure. Nevertheless, all but one respondents, were able to follow the complicated RRT-rules:

“At first I was afraid I couldn’t do those two things at the same time. I am kind of chaotic you know, and then I panic and think I can’t do it, but hey, I managed and it was not as difficult as I thought it would be. It was more like a game.” (R18)

In the first phase of this study three respondents found it confusing that they had to use real dice to answer six questions and the virtual dice to answer the other six. Although they saw the dice on the computer, they threw them manually too. Two of them saw their error after two questions and stopped throwing, one of them used both methods for all six questions. Respondents preferred the internal dice. They found it easier, more pleasant and they were not, as they said, distracted from the computer by throwing the dice:

“The computer is easier than throwing ordinary dice. You are being distracted, you have to take the dice out of the box and otherwise you concentrate on the computer and then you watch and you can go on a stretch. You do not have to turn away from the screen. When I turn away and I throw, I had to think what was it all about again. At the top of the screen, I saw what I had thrown, otherwise I tend to forget that too. I would rather stay behind the computer and just push the key”. (P3)

However, throwing the dice manually is experienced as taking one’s fate into one’s own hands. With one question, one of the respondents cheated by throwing twice to be able to give a different answer. Another respondent acknowledged that when you do not want to play fair, you do not have to bother throwing twice but just fill in the wrong answer. It was decided to use only the virtual dice in the second phase to prevent all this confusion.

Cheating: Forced to be dishonest

When we use an RRT to study a sensitive topic we open the doors for a new source of error, namely cheating. For any reason respondents can refuse to follow the RRT rules. Respondents in our sample did dislike to give a forced positive answer when their “own true” answer was negative:

- I: Did you have to give a forced answer?
P: Yes, with the site caravan, whether I have a site caravan. Well, I would like to have one!
I: How did it feel to give a forced “yes” answer?
P: I know it is part of the game. But no, of course it is not funny, because I do not own one. But the computer wants me to have one. OK, have it your way. And there was this other question, whether I have lived with a partner without telling the Department of Social Services. I was forced to say yes, but when I had a friend, I was afraid of not telling the Social Services, because family benefits are less than the benefits for the two of us. But I was afraid someone would knock on the door and would say I did something wrong, so I told them right away”.
(R1)

In the interviews the respondents introduced the term ‘forced to be dishonest’. They all stressed the importance of being honest. Giving forced answers to a question, in particular positive answers when they should be negative, was felt to be dishonest and unpleasant. This is confirmed with statements about a ‘lucky throw’ or a ‘good’ hand. These were experienced when the dice hit between five and ten. Then the respondents could give their own answer. A bad throw was interpreted as a forced answer that did not correspond with the “true” answer and conflicted with their conscience. Even when their throw mouthed

their answer, they all read the question anyway to see what they had to confirm or deny. This satisfied their curiosity, but stressed the fact that they gave a dishonest answer.

Being honest was important to the respondents, but that did not mean that they all dodged the RRT rules. When asked whether they actually gave the forced answer anyway, in the first phase eight of them told us they did so because, as one of them commented: “It is not the truth, but it is known that it is not. These are the rules of the method.” One person did not have to give a single forced answer and could not imagine what it would feel like. One person said she did not comply on purpose with the instructions and just gave her own answers (cheating). She explained as follows:

“You have no power over the dice. When they fall on twelve, then you have to say no. Something is being forced on you. And then it is just like eating, you have to eat spinach but you don’t like it. Well, then I won’t do it. That thing [= the computer] is a dead thing. It obliges me to press a key I do not want. My answer belongs to me”. (R8)

In the second phase of the study these feelings of dishonesty were acknowledged by adding an *extra piece of instruction* just after the trial questions.

“ You have just filled out three trial questions. Maybe it has happened that you threw 2, 3, or 4, and had to press “yes”, where your true answer to the question should have been “no”. Or that you threw 11 or 12 and had to answer “no”, where your true answer should have been “yes”. From earlier research we know that some people find this strange, and think their answers to be false and their behavior to be dishonest. But you do not have to worry about that. This ‘dishonesty’ is part of the dice method. Here different rules apply and you are honest when you answer according to the dice. It is like a game, when you play it by the rules of the game you play it honestly (R3)”

This phrase aimed at changing the respondent’s cognition about ‘being honest’. This manipulation seemed helpful. Respondents better understood that being honest in a randomized response survey like this meant to follow the randomized response rules. In the second phase only one respondent was not prepared to give forced positive answers.

Lying: the meaning of honesty

Did respondents understand how RRT safeguarded their privacy, and did they trust the RRT enough to cooperate and give honest answers to sensitive questions? At the start of the interviews we asked the respondents to explain to us the rules of the RRT in their own words. All of them could explain the Forced Response procedure in terms of dice thrown and decisions made to answer with a forced ‘yes’ or ‘no’ or conform the truth. Like for instance:

“Well, you have to read it very carefully. And, with several throws I could say yes or no, so I could answer honestly. What I know of two, three and four is that I had to say ‘yes’. With eleven and twelve respectively ‘no’, when I’m right. But I did not throw that.” (R13)

Respondents had far more trouble explaining the rationale behind the way the RRT protects their privacy. Only eight people could explain *how* the Forced Response method safeguarded their privacy:

“I trust it with the dice. I think it is a good method. I think it will work, since in this way it can never be found out whether it is lied or real. I suppose that my throws with the dice are not registered in the computer. Now, Social Services can phone me and accuse me of having a site caravan, but that is not true because I was forced to say ‘yes’. They can not get at the truth.” (R16)

Understanding does not automatically lead to compliance since most of the respondent's report that they would consider it harder to comply was this study conducted by people of the Department of Social Services. Here we find a parallel with the results of Richman and coworkers' meta-analysis. Respondents' cooperation was only partly based on trust in the CARR, other guarantees were also important. For instance, they trusted the researchers who assured them that their information was confidential. Others remarked that the computer gave them a feeling of anonymity or that they felt anonymous because their name was concealed.

When the respondents throw five till ten, they had to answer truthfully. Fourteen respondents told us they answered truthfully when they had to. These 14 respondents could be categorized into two categories. The first category was the group of respondents that gave straightforward honest answers, even when the answer put them in a negative light. They did not beat around the bush but were willing to answer the randomized response questions truthfully when asked. For instance one respondent told us in the interview that, when she was asked whether she had had any other incomes than her allowance, she answered yes, because she had sold shortly before a self-made piece of art for 500 Euros².

The second category was the group of respondents that was more ambivalent towards the questions. They were willing to answer according to the truth when throwing 5-10, but they were not convinced they had broken a regulation. They explained to us that there was a large grey area where their own conscience was their measurer and not the Department of Social Sciences. One respondent told us that she had answered affirmative when asked whether she had refused a job (tram conductor) that was considered "suitable" by the Department of Social Services. She rationalized this behavior by telling us that she felt that at that time the job was not suitable for her because there was the possibility of entering aggressive situations. As a consequence of being a single mother she had found the job not suitable at all. This respondent knew she had broken the regulations of the Department of Social Security (i.e. she refused a suitable job), she finked the 'yes' alternative, but thought that to be acceptable conduct from her own point of view.

Lying was found in the group of respondents who also knew that they broke the regulations, but were not willing to admit this, not even on the CARR questionnaire. These respondents also used rationalizations to explain why they found their conduct totally acceptable:

"Well, here I can tell you, but not in a survey for the Department of Social Services. I have had a friend for five years and I visited her every weekend and what's it to them? They cut your benefits right away. And I did not live with her, I still lived on my own and for me a relationship is when you live together. And then you *have to* lie about that, because they cut you down and they are in my opinion much too fast with that. So they cut you down for hundred Euro and then my friend says it's over, what kind of problems do I have? Then you are forced to stick to the girl because of the money." (R2)

There have doubtlessly been respondents who have been holding back information. An indication of this was that one person did not want to be video taped, while another only provided additional information after he had ascertained himself that the tape recorder was off.

Recommendations

Our study aimed at increasing the effectiveness of randomized response research in a computer assisted interviewing environment. Therefore we used our results to distil a series of recommendations. It is beyond any doubt that all the rules that apply for excellent question making and quality management in

Qualitative research on the assumptions of Randomized Response Techniques, 08-01-03
data collection should also be taken into account when one develops a CARR questionnaire. The following recommendations add to these basics, and aim at increasing researcher's control on CARR.

About a computer assisted randomized response approach:

- In general, computer-assisted randomised response is not a problem for the respondents in our study, who had limited education and computer experience. Although there were some problems, respondents were capable of dealing with the questionnaire on their own within a reasonable amount of time. The instructions should be clear and the layout should be spacious to make it more legible and to prevent mistakes in reading.
- To overcome a feeling of depersonalisation while using the computer, the tone of the text should be adapted to a personal conversational level whenever possible.
- Internal dice could be used. Respondents prefer the virtual dice because these did not distract them as much from the questions on the screen and they did not have problems with the anticipated possibility of privacy violation.

About cheating

To decrease the probability that respondents cheat on the randomized response rules the following improvements could be made:

- To avoid cheating in a Forced Response questionnaire it is necessary to acknowledge the fact that being forced to answer contrary ones own private truth is difficult. Redefining the construct of 'being honest' in the RRT instructions decreased cheating in our sample to almost none existing.
- To prevent respondents from reading and answering all questions before deciding what has to be answered according to the RRT rules, we changed the lay-out from 'question followed by instructions'

'Did you go on holidays abroad for over three weeks without notifying the Department of Social Security?'

When you have thrown 2, 3, or 4 please answer '1 = yes'

When you have thrown 10 or 11 please answer '2 = no'

When you have thrown 5, 6, 7, 8, 9, or 10 please answer the question truthfully

to 'instructions followed by question'

When you have thrown 2, 3, or 4 please answer '1 = yes'

When you have thrown 10 or 11 please answer '2 = no'

When you have thrown 5, 6, 7, 8, 9, or 10 please answer the following question:

'Did you go on holidays abroad for over three weeks without notifying the Department of Social Security?'

This order will guide the respondent through the RRT process and will prevent the respondent from reading the sensitive question first.

About lying

To decrease the tendency to lie in an RRT questionnaire the following improvements could be made:

- To prevent lying it is important to make it very clear how respondents' privacy is protected and that the data can not be disclosed to other parties.
- Try to rephrase a question in such way that it accredits the truth of the respondent. The question *'Have you ever refused a suitable job that was offered to you by the Department of Social Services?'* could be rephrased into

Qualitative research on the assumptions of Randomized Response Techniques, 08-01-03

'Have you ever refused a job that was offered to you by the Department of Social Services, because you thought it was totally unsuitable?'

This means that a thorough pilot study on the standards of the deviant sub-population is necessary.

- Add questions about the 'third' party. This will give the respondents the opportunity to blow off some steam, it will prevent the respondent from feeling the only accused party and the answers can help the third party to improve their service towards their client. As an example: in the final version of our CARR questionnaire we added the questions:

Have you always been treated respectfully by your Social Services Department?

Are the employers of the Social Service Department always kept their appointments?

- It is also important to rephrase some questions so that not only the 'yes' answer is incriminating. This will make it necessary for the respondent to stay alert and a real mix of yes and no answers will become the expected answer pattern instead of a sure sign of an incriminating pattern. The question:

"Have you ever provided incomplete or incorrect information to the Social Services about additional income that you received?"

could be rephrased into:

"Have you always provided complete and correct information to the Social Services about additional income that you received?"

It is important to remember that when you rephrase the questions double negatives should be avoided at all times.

This study gave insight in the psychological processes of respondents handling CARR. We gave several recommendations that have the capacity to increase the validity of CARR results. Generalization of our recommendations over different sensitive topics is difficult, because of the important role that the content of the questions and the topic had on the respondents' motives to lie or cheat. Still we are convinced that most of these recommendations have the potential to enhance data quality in different sensitive fields (insurance fraud, academic cheating, and organizational fraud). In the next phase empirical research has to show if these recommendations will improve the results of a second randomized response study on social benefit fraud, making the use of computer assisted randomized response (CARR) opportune in survey research on sensitive topics.

¹This study is originally conducted for the Ministry of Social Affairs and Employment in the Netherlands. The authors want to thank NIPO Amsterdam, for their assistance during the data collection.

² 1 Euro ± 1 USDollar

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1. **Appendix: Topic List**

Introduction: How did it work out?

The computer

- readability of the text
- operating the computer
- clarity instructions?
- Did you follow the instruction?

The randomized response method

- experience with throwing the dice
 - Were you tempted not to count them correctly? when?
 - Have you ever thrown more than once? when?
 - Did you do what was on the instruction card? when didn't you?
- Was it difficult for you to find out what you had to answer?
- Did you make any mistakes that you know of?
- How did you experience the dice on the screen?
 - Did you try to stop them at a certain chosen moment?
 - Did you intend follow the instructions? When /when not, why /why not?
- Is there a difference between throwing the dice yourself and the dice on the screen?
 - What exactly is the difference?
- Did you have to answer 'yes' because of the dice while your answer was no?
 - How did that feel? why? how did you deal with that?
- Did you have to answer 'no' because of the dice while your answer was yes?
 - How did that feel? is it different from a forced 'yes'?
- Did you give a true answer when you had to? why (not)? Any examples?

Knowledge of the method

- How was it to deal with questions in this way?
- In a real study, would you prefer this method or the common questionnaire?
- Do you believe that this method guarantees your privacy?
- How does this method guarantee privacy?
- If this method with the dice was used in a large scale study, would you:
 - answer 'yes' or 'no' when the dice tell you? when? why?
 - give a true answer when asked? when? why?
- Do you think that people will be more inclined to answer truthfully when this method is used than when the common questionnaire without the dice is being used?
- Do you see any possibilities of making this method more attractive?

The questions

- What did you think of the questions? Are you familiar with them?
- Do you have specific worries when answering these kind of questions on your social security benefits?
- Do you think they are sensitive? Can you say something more about that? Were there questions that you particularly think of in this respect?