

# **Interactive Coding in the Field: A Test**

**Discussssion paper 07008**

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## **Explanation of symbols**

.	= data not available
*	= provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
0 (0,0)	= less than half of unit concerned
–	= (between two figures) inclusive
blank	= not applicable
2005–2006	= 2005 to 2006 inclusive
2005/2006	= average of 2005 up to and including 2006
2005/'06	= crop year, financial year, school year etc. beginning in 2005 and ending in 2006
2003/'04–2005/'06	= crop year, financial year, etc. 2003/'04 to 2005/'06 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

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*Summary: This paper was presented at the QUEST (Questionnaire Evaluation Standards) Workshop, 21-23 October, ZUMA Mannheim, Germany. A Questionnaire lab test will be discussed concerning new questions on respondents' education, occupation and company as well as automatic coding of the answers.*

*Keywords: Coding, Conversation Analysis, Questions on education, occupation and company, Pre-test.*

## 1. Introduction

At Statistics Netherlands all coding of answers to open questions from household surveys is currently done by specially trained coders at the office. The interviewers in the field are instructed to probe the respondent in order to get as much information as possible. Still, the interviewers never know for sure whether they have gathered sufficient information. The respondent's answers have to be typed down verbatim. All this information in the form of text strings is sent to the office. The coders have these text strings at their disposal to try and link a specific code to the answer. This can partially be done automatically, by means of a data base in which frequently used text strings are already linked to codes. All text strings that are not present in the data base have to be coded by hand. Here the coders rely on experience and on vast manuscripts with standard classifications.

Interviewers at Statistics Netherlands are not trained to be coders. Of course, a part of their task is to code respondents' answers, but this task is limited to assigning a given answer to one of the response categories of a question. For several reasons they are not asked to code open answers. Coding to the level of at least four digits is a very specific skill, which needs a lot of training and experience. Since there is a significant turnover of interviewers they have no time to gain experience and it would be too costly to give them all a thorough training.

In 2002 a project was started to make the process of coding answers to open questions for respondents' education, occupation and company more efficient. The division of Social and Spatial Statistics and the division of Technology and Facilities joined forces to develop alternative ways of coding. The result was a coding programme which is integrated in the questions. In short this means that after the answer of a respondent is typed in the laptop by the interviewer the coding programme will try to find a corresponding code in a data base on the laptop. The idea behind coding in the field is that the codes are possibly more accurate, because the interviewer can verify the coded answer with the respondent. The interviewer, then, is not an actual coder. Another advantage of this coding programme is that interviewers get feedback whether enough information has been gathered, because the coding programme generates the appropriate follow-up questions until a sufficiently detailed code has been reached.

During the development process the new questions have been tested several times. The coding programme has been thoroughly tested whether it links the right code to the right answer. In August 2002 the new questions were tested by themselves, i.e. not integrated in a survey. This was the first test in which it was tested whether interviewers could work with the coding programme. Some conclusions from this test were: (1) that the instruction of a few hours was too short to familiarise the interviewers with the coding programme, (2) that the coding programme took much time to search through the data bases which caused awkward silences in the dialogues, (3) the interviewers reacted often surprised and out loud to the actions of

the computer. After this first test several improvements to the questions and the coding programme were made. These improvements were tested in the follow-up test in April 2003 (Vis & Beukenhorst, 2003), which will be discussed in this paper. In the present test the impact of the coding programme on an interview was investigated as well, i.e. what happens before and after the coding programme has done its work. The interaction between the interviewer and the respondent and between the interviewer and the new questions were the main interest of the test. The aim of the questionnaire lab test was to find out:

1. how long the new questions take,
2. whether the respondents can answer the new questions,
3. how do respondents react to the questions,
4. whether the interviewers can handle the new questions, and
5. whether the new questions disturb the interview.

First we will discuss the questions and some aspects of the coding programme that were tested. After that we will describe how we conducted the test. The methods that were used to analyse the test data will be discussed next. Finally the results from the test will be presented.

## **2. The questions to be tested**

In most household surveys some questions about a respondent's education, occupation and company are asked. The questions are not dealt with elaborately in every survey, but in the Labour Force Survey (LFS) they are most prominently present. The questions are not literally the same in each survey, for this test we took the questions from the LFS. The original open questions in the LFS are:

- *What kind of company or institute do you work for?*
- *What is your occupation or function at this moment? What are your main (executive) activities at work?*
- *Which course or training have you followed? What kind of course or training was it? Was there a specific subject or discipline?*

In this paragraph a basic explanation of the working of the new questions will be given (adapted from Michiels, 2003), illustrated by quotations from several interviews.

### **2.1 Respondent's company**

The first part of the new question-unit is about the respondent's company. If a respondent has indicated that the company he works for has more than 100 employees, the questionnaire will ask for the company's name. The interviewer will enter the answer of the respondent in the questionnaire. The answer is then looked up in a data base of company names. The names in this data base are all linked to a certain SIC-code (Standard Industrial Classification). The coding programme suggests up to six possible options to the interviewer. And the interviewer can consult with the respondent which option suits best. When a company name is selected, the programme stores the corresponding code.

*Interviewer: What is the name of the company or the institute you work for?*

*Respondent: ABN AMRO.*

The coding programme now suggests several possible options to the interviewer, who has to present them to the respondent.

*I: Do you work for the bank itself, or for the insurance office, or for the exchange office, or for the building fund, or for the lease holding?*

*R: No no, for the bank itself.*

When there is no match to the name of the company, or the respondent has indicated that the company has less than 100 employees, the questionnaire asks for a description of the company type. The respondent's answer to this is looked up in a data base with company descriptions, which are also all linked to a classification code.

If there is no match to the company's name or the type of company, then there is one last option to get at least a less detailed code of the type of company. This last option was still in an experimental stage and was first tried in this test. The respondent is asked whether he or she can indicate what sector the company belongs to. The answer has to be looked up in a tree diagram (see below). The idea is that you start high up in the diagram and by probing the respondent you work your way down. Each step down means an extra digit and extra information to the code. For some sectors there is only one step down, but at most there are five steps. Because the diagram is very extensive only the first sector is unfolded:

1. Agriculture and Fishing

1.1. Agriculture

1.1.1. Agriculture and horticulture

1.1.2. Breeding and keeping of animals

1.1.3. Mixed farm

1.1.4. Agricultural service

1.1.4.1. Veterinary

1.1.4.2. Non veterinary

1.1.5. Other

1.2. Fishing

2. Industry and Building

3. Trade, Commercial services and Letting

4. Transport, Storage and Communication

5. Government, Education and Health care

6. Other

## **2.2 Respondent's occupation**

The next part of the new question-unit is about the respondent's occupation. The answers are looked up in a data base of occupation descriptions.

*I: What is your occupation or function at this moment?*

*R: Carpenter.*

*I: The computer is searching... Is it construction carpenter or universal carpenter?*

*R: Construction carpenter.*

If there is no direct hit, the main activities at work are asked. The coding machine will then try to find an occupation that fits the given main activities.

*I: What is your occupation or function at this moment?*  
*R: Post office employee.*  
*I: What are your main activities?*  
*R: Processing post.*  
*I: Let me see. Post sorter?*  
*R: Yes.*

The programme also combines the answers to occupation and company. This means that not always all questions about occupation have to be asked, since some companies imply just one occupation (or a limited number of occupations). For example, if a respondent says that he works in a barbershop, the coding machine immediately suggests the occupation “hairdresser”.

### 2.3 Respondent’s education

The last part of the new question-unit is about the respondent’s education. In this part, questions are asked about the respondent’s whole educational history from secondary school on. A special feature in this module is that the answer to the first question determines the following question(s). The coding programme generates the appropriate follow-up questions until a code is reached. It is not to be said in advance how many questions are needed to reach a code. It is possible that with one question the exact code corresponding to the educational level is reached:

*I: Which course or training did you follow first?*  
*R: Havo. [Specific kind of grammar school.]*  
*I: Okay.*

But it can also take longer:

*I: Which course or training did you follow then?*  
*R: Law.*  
*I: At university I suppose?*  
*R: Yes.*  
*I: Was there a specific subject? Constitutional law, or...?*  
*R: Labour law.*  
*I: Labour law, let me see. Yes. Did you do your master’s degree or doctoral degree?*  
*R: Master’s degree.*

There is no fixed order in which to go through the questions. The interviewer can enter the first answer the respondent gives. In the previous example the respondent answered with the subject of his studies, but it is also possible that a respondent first says to what type of school he went before saying which subject he followed. The coding programme is an intelligent programme. In order to reach a certain code it presents the relevant questions to the interviewer. In other words, the programme guides the interviewer through the questions, each time following another route.

There is one drawback to the programme. It only suggests a maximum of six possible hits for each entry. If there are more than six possible hits the programme indicates “too many hits” and either the interviewer has to gather more information

from the respondent to get a more specific answer, or no code is selected and the programme skips to the next question. The answers that have not been coded by the programme will be sent back to the office to be coded by hand.

### **3. The test**

Usually a questionnaire lab test is conducted in the laboratory, yet for this test we wanted to reconstruct a field situation as close as possible, so the test was conducted in the call centre of Statistics Netherlands. This meant that the researchers, the developers and the interviewers' supervisors could be present during the test. And any problem with the questionnaire or any other problem could be solved on the spot. Eventually the new questions will be integrated in both CAPI-questionnaires (Computer Assisted Personal Interview) and CATI-questionnaires (Computer Assisted Telephone Interview).

Six interviewers participated in the test. In the previous lab test the instruction was too short, so for this test the interviewers received a whole day of instructions. At the end of the instruction day each interviewer had had at least three test interviews with test respondents. These test respondents are specifically recruited for participating in tests, and for this they receive a participation fee. Since these respondents knew it was a test the interviewers could familiarise themselves with the questions in a non-stressful way.

The next day the interviews were held with real respondents. The respondents were not aware that they participated in a test, they were asked to participate in the Consumer Sentiments Survey. The new questions about education, occupation and company were integrated in this survey. In order not to surprise the respondents with the elaborate new questions, they received a standard advance letter with an additional announcement: "*The interviewer will also ask you some questions about your education, occupation and job.*" The questions have to be asked for all household members older than 14, in many cases this will be by proxy.

For the test three interviewers made their calls in the afternoon and three interviewers worked in the evening. Between 1 and 9 o'clock in total 42 interviews were completed. Of all interviews a recording was made.

Afterwards there was an evaluation with the interviewers.

### **4. Methods used**

The interviewers evaluated the test during two focus groups. The aim of these focus groups was to find out how the interviewers had experienced the interviews, and what they thought of the new questions.

To analyse the interviews conversation analysis was used. In conversation analysis an interview is taped and afterwards transcribed and analysed by the researcher

(Visschers, 2002). For this test the sections with the new questions about education, occupation and company have been literally transcribed. The dialogues contain information about the interview and the interactions. Does the respondent understand the question? Does the interviewer understand the respondent's answer? Does the interviewer read out the question as worded? For more information about conversation analysis see Houtkoop-Steenstra (2000) or Psathas (1995).

For this test it was also possible to reconstruct the actions of the interviewer in the questionnaire by following the dialogue. The results from conversation analyses can be compared to the remarks of the interviewers, e.g. do the interviewers see the mistakes that were made and do they remark on them?

## 5. Analysis

### 5.1 Length of the interview

Whenever a new question is tested the length is a point of concern. The length of the interviews can be analysed by comparing the old interview time to the new. During the test it appeared that in some interviews the new questions about education, occupation and company took longer than the original questions. In some interviews the section with the new questions lasted up to 15 minutes. An explanation for this could be that, because it was a test, the interviewers wanted to be more thorough than usual. Still the dialogues should be analysed to see whether there is another explanation.

The questions about education for elderly respondents, and the tree diagram question in general caused the longest dialogues. This was because these questions triggered a discussion between the interviewer and the respondent. The following dialogue lasted about 6 and a half minutes, I will cite only a fragment:

...  
I: *Did you follow that course at university?*  
R: *No, not at university.*  
I: *Then what was it?*  
R: *Well, I cannot remember.*  
I: *Was it the LOI or something? [Distance learning]*  
R: *No.*  
I: *You did go to school?*  
R: *Yes.*  
I: *Was it your intention to become a teacher?*  
...

The interviewer has to get a usable answer, in order to get through the questionnaire. Yet the respondent has problems recalling this detailed information. He is talking about a short course he did almost forty years ago, which was not even part of his main education.

The dialogues for the tree diagram take long for several reasons. The respondent does not always understand what "company sector" means, and sometimes the

interviewer has to read out a lot of options. Especially “Industry and Building” has a lot of sub-items, and when a respondent doesn’t immediately say to which sub-sector the company belongs, the interviewer has to read out all possible options. Very often these dialogues do not even lead to a code, and even if there is a code at the end of the sequence, it is doubtfully the right one.

An encouraging finding for the future was that the length of the interviews decreased over time. The length of the interview apparently depends upon the interviewer’s experience with the new questions.

Even if the length of the interview decreases, it is not said that these discussions will not occur any more. We concluded that the questionnaire should be improved so that there is an elegant escape route to get out of these endless discussions, for both the education questions and the tree diagram.

## 5.2 Can the respondents answer the new questions?

In the dialogues there were several instances in which the respondent was not able to answer the question. Most frequently this happened for the tree diagram question. Respondents do not often ask for clarification, but the misconception shows from the given answers. The answers almost never fitted one of the answer categories or sectors (see paragraph 2.1). Some examples of answers to the question: “*Can you say to which sector the company you work for belongs?*”

*“Conductor of an orchestra.”*

*“Seafood sector.”*

*“Building company.”*

*“Cocoa factory.”*

The answer categories in the tree diagram are literally taken from the classifications that are used at the office. A respondent, nor the interviewer, thinks in terms of such classifications. Copying the literal terms from the classifications into the answer categories caused other misinterpretations as well:

*I: Can you say to which sector the company you work for belongs?*

*R: Chicken farm.*

*I: So that is agriculture.*

*R: Yes.*

*I: Is it breeding and keeping of animals?*

*R: No.*

*I: No?*

*R: I only keep chickens, I don’t breed them.*

A similar situation occurred when the respondent and the interviewer interpreted the category “wholesale business, trade mediation” as two activities belonging together. Since the respondent worked for a wholesaler the category was not chosen and a lengthy search for the right code commenced. It is not clear to the interviewer and the respondent that the comma in the answer category means “and/or”.

Our recommendation is that the answer categories should be made more respondent and interviewer friendly and they should be closer to a respondent’s train of thought.

### 5.3 Reactions of the respondents

Before the test one of the risks we anticipated was that the respondents would wonder “how do they know all that?” The respondent is not aware of the fact that the interviewer has a lot of information available in the coding programme. The hypothesis was that a respondent could feel it as a violation of his privacy if, for example, the computer would know that a respondent works in a bakery, after he had given only some minor information about the company’s name and size. The fear was idle, this situation never occurred. In fact, several respondents were pleasantly surprised that the interviewer seemed to know what they were talking about. In the focus group interviewers made similar remarks on this. In these situations the coding programme made them feel more secure, and they could show more interest in the respondent.

### 5.4 Can the interviewers handle the new questions?

Even with the longer instruction, the interviewers learned most by simply doing the interviews. Clearly the interviewers got more confident with the questions during the day. This resulted in shorter interviews over time. The coding programme was completely new to the interviewers. At first they had to search for the right commands to give to the computer, later this became a routine. The interviewers were surprised by every move the computer made and they were confused because the computer did not follow one specific route through the questions. Later this became a bit easier, but it was difficult for the interviewers to rely on the programme to guide them. One interviewer got in a bit of trouble, because she assumed that there was a fixed routing in the questions:

*I: What kind of company or institute do you work for?*  
*R: For an architectural firm.*  
*I: Let me see, I now have two options. Architect for civil, commercial and industrial building design, or architect for other technical design.*  
*R: The second.*

The interviewer does not wait for the computer and asks:

*I: What is your occupation or function at this moment?*  
*R: I'm the director.*

Here the interviewer sees that the computer, without presenting the question first, suggests “architect” as occupation. This is very different from what the respondent just said, so she has to start a discussion to set things right.

*I: Er... let me see. You do not work as an architect yourself then?*  
*R: Yes, I do.*  
*I: What would you say is your main occupation, director or architect?*  
*R: Architect.*  
*I: Okay.*

It became clear that the interviewers still thought in terms of the old questions in which they had to probe and probe. Pronouncing the questions verbatim was secondary. Getting an answer (any answer) was the most important thing. In the

following example a mother is asked to answer questions about her son, but there are some things she really does not know.

I: *What is his occupation or function at this moment?*  
R: *Administrative worker.*

For most people this occupation would seem perfectly clear, but linked to this term are many different codes depending on main activity.

I: *Is it an executive function?*  
R: *No.*  
I: *And what are his main activities?*  
R: *Well, I don't know. He has been working there only for a few days. I haven't yet heard much about it.*

The interviewer does not settle for “don't know”, so she suggests a possible activity. In fact she directs the respondent in a certain direction.

I: *Is he concerned with the bookkeeping?*  
R: *Yes.*  
I: *At least that then. Let me see, let's fill that in.*

The interviewer now gets several options, among other things “junior accountant” and “certificated accountant”.

I: *Is he certified?* (In Dutch this could also mean, “does he have a diploma?”)  
R: *Yes.*  
I: *Okay.*

In this example a boy, who has just started working as an administrative worker, has been coded as a certificated accountant. The interviewer's urge to get a direct hit has caused a false code. This is a dilemma, because we want the interviewer to gather as much information as possible, but we do not want them to direct the answers. Schober & Conrad (2002) say: “Since interviewers always influence responses, this raises the question of which kinds of influence are benign and which are not. We argue that the criterion should be how interviewer behaviors affect response accuracy – that is, how well responses correspond with the definitions the survey author had in mind.” This means that the interviewers should be trained well, and that they should know the aims of the researchers. If it is not possible to explain the precise aims of the researcher the interviewer should be instructed to accept not reaching a hit in some occasions.

## **5.5 Does the coding programme disturb the interview?**

It is very unusual in a telephone interview that there are silences, this is logical since the only contact with the other person is by means of speech. Neither party knows what happens at the other end of the line. By talking or by making noises an interlocutor shows that he is still there and that he is still participating in the conversation. There are two different kinds of silences, the first occurs between the end of a question and the beginning of an answer and the second occurs between the end of an answer and the beginning of the next question. During the first the

respondent is thinking which answer to give. During the latter the interviewer is most probably typing the answer, and the clicking of the keys can be heard. What usually happens during an interview is that a respondent makes thinking noises while searching for the right answer, for example sighing out loud, “er”, or clicking with the tongue. The interviewer also tries to keep the silences as short as possible, by quickly repeating the question, or by adding some information for example. While the clicking of the keys can be heard the silence is often not broken, since the reason for the silence is clear.

In the test the coding programme still wasn't fast enough to avoid awkward silences. Also there occurred another kind of silence, i.e. the silence while the interviewer is waiting for the computer. These silences triggered slightly different reactions from the interviewers. In many cases the interviewer started explaining what was happening. Remarks that are often heard are:

*“The computer is searching.”*  
*“This is a new programme.”*  
*“I'm waiting for the computer.”*

In some cases the interviewers already beforehand said to the respondents that they are working with a new questionnaire and that things might go a little slow.

The respondents also react to the silences since they cannot hear what is happening on the other end of the line. They sometimes interpret the silence as a sign that there is something wrong with the given answer. So they start to help the interviewer:

*I: Can you say to which sector the company you work for belongs?*  
*R: Er, food, right. Er, cocoa, cocoa butter...*  
*I: Is it for manufacturing or trading or -...*  
*R: Yes yes it's for de the products we make, for the chocolate-industry. You should look in the cake-sector.*  
*I: [silence] That's not right in any case. I have to look where I'm going to put it. I will try Trade. Let me see what he does. Oh, no I can't find it there, that's not right. I will have to find it in Industry. I'll put it there. [silence]*  
*R: The address is Xxx-street in Haarlem.*  
*I: Well he won't know the address any way. No I will put it under “Other”.*

With the questions about education the respondents sometimes interpret the silence as a sign that they can go on. It happens that the respondent already mentions the next training while the interviewer or the computer is still processing the first training.

The coding programme, or the computer as a whole, becomes rather important in the conversation. It not only guides the questions and the conversation, but it also becomes a conversation partner. In the dialogues you hear very often the interviewers' surprised reaction to actions of the computer. The interviewers do not just accept the actions of the computer, but they respond to it and they draw the computer into the conversation.

*“I'm waiting for the computer.”*

*“The computer says...”*  
*“Oh no the computer says something else.”*  
*“The computer is searching.”*  
*“Let me see whether the computer can find it.”*

One explanation for this phenomenon could be that in other surveys the questionnaire follows a fixed route so the interviewer is never surprised by the computers actions. With the new questions and the coding programme, the interviewer not always knows for sure what the next step in the questionnaire will be. It is expected that the interviewers eventually will get more used to the new coding programme, but at the moment the programme intrudes into the conversation.

Drawing the computer’s view into the conversation can be positive, because it can force the interviewer and the respondent to clarify themselves or to discuss their point further. It can also be negative, for example when the computer cannot find a direct hit and says “Too many hits”. This can push the respondent in the defence, because what he perceives as the truth is not acknowledged by the computer. Or as a respondent said: *“But my company really exists!”*

## **6. In closing**

In this test, conversation analysis turned out to be a rather fruitful tool to find several shortcomings in the new questions. The change in length of the interviews can be shown very easily, but conversation analysis additionally shows the cause of the lengthening. For instance, the phrasing of the questions and the lack of an escape route caused the long dialogues for the questions about education for an elderly respondent.

The coding programme has generated a list of coded answers. This shows that it functions well, that is, it is able to generate output. Yet with conversation analysis you see that in some cases the code that has been selected is not or doubtfully the right one, e.g. the administrative worker that became a certified accountant.

During the evaluation the interviewers said that they were unaware of drawing the computer into the conversation, nor were they aware that it disturbed the interview. However by analysing the dialogues the impact of the programme on the interviews became clear.

In the focus groups the interviewers were rather positive about the interviews. There were some that mentioned the length of some interviews, but overall they were rather positive about how everything went. Still with conversation analysis you see that not everything went well during the interviews.

Besides this, conversation analysis has some drawbacks as well. For instance, it is a rather time consuming method, especially when all interviews have to be transcribed completely.

After this test the questions and the coding programme were modified according to our recommendations. In September 2003 a field test was conducted and finally in January 2004 the questions will be integrated in all surveys of Statistics Netherlands.

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