OVERCOMING THE PROBLEMS OF SPECIAL INTERVIEWS ON SENSITIVE TOPICS: COMPUTER ASSISTED SELF-INTERVIEWING TAILORED FOR YOUNG CHILDREN AND ADOLESCENTS

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Abstract

Self-administered questionnaires have many advantages, especially when sensitive questions are asked. However, paper self-administered questionnaires have a serious draw-back: only relatively simple questionnaires can be used. Computer Assisted Self-Interviewing (CASI) can overcome these problems, and make it possible to use very complex self-administered questionnaires.

CASI can take several forms, for instance, it can be a part of a personal (CAPI)interview where the interviewer hands over the computer to the respondent for specific questions. Another form is a computerized version of the mail survey: Disk-by-Mail. We have used both forms in an application for very special populations. In the first study we implemented a Disk-by-Mail survey on bullying in primary schools; the respondents were 6428 pupils aged 8-12 years. The second study was a survey on personal networks, dating, and well-being of adolescents and young adults with a visual handicap (aged 14-24). This study was a mixed-mode CAPI and CASI survey.

This paper presents a literature review of data quality in CASI-surveys, describes the general logistic of both surveys and the special adaptations we had to make, and presents empirical findings on data quality and general recommendations for the adaptation of computer assisted (self) interviewing for special populations.

Key words: sensitive questions, special groups, disk by mail, CAPI, self-interviewing

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1. Introduction

Self-administered questionnaires have many advantages, especially when sensitive questions are asked. Self-administered procedures evoke a greater sense of privacy, which leads to more self-disclosure (Sudman & Bradburn, 1974; Tourangeau & Smith, 1996). Empirical research has shown that self-administered questionnaires when compared to interviews, produce more valid reports of sensitive behavior and less social desirable answers in general (for a comprehensive review see De Leeuw, 1992).

Furthermore, in self-administered procedures the respondent is the locus of control, who determines the pacing of the question-answer process. The more leisurely pace of the self-administered procedure gives the respondent more time to understand the meaning of the question, and retrieve and compose an answer, which improves the quality of answers (cf. Schwarz, Strack, Hippler & Bishop, 1991). This is especially important when surveying special populations, such as children, adolescents and elderly (De Leeuw & Collins, 1997). Additional advantages of mail surveys are low costs and minimum requirements of resources.

However, paper self-administered questionnaires have a serious draw-back: only relatively simple questionnaires can be used. Complicated skip and branch patterns or adjustments of the order in which the questions are posed, threaten both the data quality and the motivation of the respondent to complete the questionnaire. Computer Assisted Self-Interviewing (CASI) overcomes these problems, and makes it possible to use very complex self-administered questionnaires successfully. In CASI the interview program handles the questionnaire logic and question flow. Respondents simply read each question from the screen, type in an answer, and are no longer burdened with complex routing instructions. In the case of very sensitive questions, the use of a computer may further enhance the feeling of privacy of the self-administered form. After an answer is given, it disappears from the screen, while an answer written down remains on the paper for everyone to see. Therefore CASI is especially suited for special population surveys on sensitive topics.

CASI can take several forms, for instance, it can be a part of a personal (CAPI) interview where the interviewer hands over the computer to the respondent for specific questions. Another form is a computerized version of the mail survey: Disk-by-Mail. We have used both forms in applications for special populations. In the first study we implemented a Disk-by-Mail survey on bullying in primary schools; the respondents were pupils aged 8-12 years. The second study was a survey on personal networks, social support, and well-being of adolescents and young adults with a visual impairment (aged 14-24). This study was a mixed-mode CAPI and CASI survey.

In this paper we start with a literature review of data quality in CASI-surveys, and we then describe the general logistic of both surveys and the special adaptations we had to make. We present empirical findings on data quality and end with general recommendations for the adaptation of computer assisted (self) interviewing for special populations.

2. Data quality in computer assisted self interviewing (CASI).

In this section we review the literature on acceptability of CASI for respondents and the impact of CASI on data quality.

2.1. Acceptability for respondents

Respondents generally like CASI; they find it interesting, easy to use, and amusing (Zandan & Frost, 1989; Witt & Bernstein, 1992). Beckenbach (1992, 1995) reports that more than 80% of the respondents had no problem at all using the computer and the interviewing program, and that few respondents complained about physical problems such as eye-strain. Furthermore, respondents tend to underestimate the time spent answering a computer assisted questionnaire (Higgins, Dimnik & Greenwood, 1987).

The general positive appreciation of CASI also shows in the relative high response rate with Disk By Mail (DBM) surveys. DBM response rates vary between 25% and 70%, and it is not unusual to have response ratio's of 40 to 50 percent without using any reminders (Saltzman, 1992). Assuming that DBM is typically used with a special population interested in the research topic, a comparable, well conducted, paper mail survey using no reminders may be expected to yield about 35% response (Dillman, 1978; Heberlein & Baumgartner, 1978). Of course, one should realize that DBM is restricted to special populations who have access to a computer.

2.2. Effect on data quality

The technological possibilities of CASI have a positive influence on data quality. Item nonresponse is minimized by computer controlled routing and by checking whether an answer or a 'do-not-know' is entered before proceeding to the next question. A consistent finding in the literature is that item-nonresponse caused by respondent- or interviewer errors, is virtually eliminated, but that there is little reduction in rates of explicit 'do-not-know' and 'no-opinion' answers (Nicholls, Baker & Martin, 1997)

As respondents are generally positive about CASI, we expect that respondents will experience a higher degree of privacy and anonymity, which should lead to more self-disclosure and less social desirability bias. Support for this hypothesis is found in the literature. In a meta-analysis of 39 studies, Weisband and Kiesler (1996) report a strong and significant effect in favor of computer forms. This effect was stronger for comparisons between CASI and face-to-face interviews, but even when CASI was compared with self-administered paper-and-pencil questionnaires, self-disclosure was significantly higher in the computer condition. The effect reported was larger when more sensitive information was asked. Weisband and Kiesler (1996) also report the interesting finding that the effect has been diminishing over the years, although it did not disappear! They attribute this to a growing familiarity with computers and their possibilities among the general public.

The effect of computerization on the quality of the data in self-administered questionnaires has also been a concern in psychological testing. In general, no differences between computer assisted and paper-and-pencil tests were found in test reliability and validity (Harrel & Lombardo, 1984; Parks, Mead & Johnson, 1985). This is confirmed by a meta-analysis of 29 studies comparing conventional and computerized cognitive tests (Mead & Drasgow, 1993). However, there are some indications that time pressure interacts negatively with the perceptual and motor skills necessary for reading questions from a screen and typing in answers correctly. Therefore, respondents, especially when they are a special or 'difficult' group should never be put under time pressure (for a more detailed discussion see De Leeuw, Hox & Snijkers, 1995).

In sum: empirical comparisons between paper-and-pencil and computer assisted self-administered questionnaires point to less item-nonresponse and more self-disclosure in the computer assisted form. Furthermore, respondents like this method, which is reflected in its high response rates compared to paper questionnaires.

3. A Disk by Mail Survey of pupils in primary schools[2]

In spring 1995 a Disk by Mail survey was implemented in 106 primary schools; they formed a sample of primary schools and were scattered all over the Netherlands. The respondents were 6428 pupils, aged 8-12; the topic of the questionnaire was bullying. The questionnaire of 99 questions focussed on attitudes regarding bullying, handling of bullying by teachers and parents, and actual bullying, either as a victim or as active culprit.

Traditionally this type of research is done with group administration of paper self-administered questionnaires in the classroom. This method has two severe drawbacks: lack of motivation of pupils to complete a long paper test and the potential influence of the close proximity of classmates on the answers (Scott, 1997). As pupils are in general very reluctant to talk about bullying, even to their parents or teachers, we searched for a procedure that enhanced feelings of privacy and created a more informal, relaxed mood. To keep the children motivated it is important that the questionnaire *appears* simple and attractive. CASI can meet these demands. An additional point is that printing and mailing such a large number of questionnaires will be rather costly. Thanks to a large government sponsored project to improve computer literacy among the young, all primary schools in the Netherlands are equipped with personal computers of the same type, and teachers have a basic knowledge of computer technology. Therefore, the basic requirements for a successful DBM were met (cf Witt & Bernstein, 1992).

3.1. Logistics

A Disk by Mail version of the questionnaire was developed using the CI3-program. Range checks were defined for all questions, and questions were randomized within blocks of related questions. A special code (9) was defined for 'do-not-know'; however, this possibility did not appear on the screen, but was stated in a special instruction. To accommodate this special population, the possibility was created for a temporary stop when a child was tired or when the teacher needed a pupil. The pupil could resume answering the questionnaire at a more convenient time. Also, to make the task as simple and attractive as possible, special attention was given to the screen lay-out. A paper version of both questionnaires was available as back-up. Six schools used this paper version; the main reason was that those schools were extremely large, and that it would take the teachers too much time to have their pupils take the individual computer questionnaire.

A small package, consisting of two or more disks (depending on the number of computers), three short printed instructions and an accompanying letter, was sent to the teachers of the participating schools. The disk contained automated batch-files for starting the questionnaires, pausing and resuming, saving the data, and making back-ups. Two of the printed

[2] For more details see Van Hattum & De Leeuw (1997)

instructions were for the teacher: one gave instructions on how to start up the children's questionnaire, one gave instructions to start up a special teacher's questionnaire. The third instruction, a yellow page with eight points in large letters, was developed for the pupils. This instruction was simple and to the point and was always kept besides the computer. Main points in the instruction were the use of <enter> and <back space>, and an explanation of the 'beeb' when a child gave an out of range answer or used <enter> without giving an answer. The instruction also stated that they were allowed to type in '9' if they REALLY could not give an answer to a specific question.

The teacher implemented the questionnaire and allocated pupils to answer the questionnaire individually on the computer. A telephone help desk was operating, and if necessary people were stand-by to go to a school with problems. Also several university laptops were available as back-up or as an additional computer for large schools. In one case, an assistant went to the school to give general support; this school had specifically asked for assistance because they were very worried if they were capable enough to do the 'computer things'.

3.2. Data quality

We investigated the acceptance of the method, the data quality, and the costs involved.

Acceptance: At the end of the data collection period the participating teachers received a personalized report based on the results of their class and were asked to complete a short evaluation questionnaire. The results were encouraging. Teachers were positive, even elderly teachers and teachers with limited computer experience. Furthermore, even the youngest children liked the procedure. The teachers also reported few problems during the data collection. The problems that were encountered were mainly general reading or language problems, not technical ones concerning the computer or keyboard.

Data quality: We could also compare the results of the CASI-questionnaire (245 classes) with those of the paper-and-pen questionnaires (PAPI) that were used in a limited group of very large schools (18 classes). The classes were comparable regarding background characteristics of the teacher (e.g., teaching experience, education, class level).

A far higher percentage of *missing values* ($p=0.00$) occurred in the PAPI-condition. In de CASI-group the mean percentage of missing values was 5.7 while in the PAPI-condition the mean of the percentage missings was 14.1. A very interesting result is that the corresponding standard deviations also differed strongly between the groups. In the CASI-condition the standard deviation was 3.4, in the PAPI-condition the standard deviation was 25.0. These results suggest that not only the average amount of missing data is less in computer assisted data collection, but also that the individual variability, indicated by the standard deviation, is less. This can be attributed to the fact that with a paper questionnaire children who are not very concentrated or who are careless can easily skip a question or even a whole page by mistake. CASI forces children to be more precise.

The main pupil's questionnaire also contained a short test measuring the tendency to give *socially desirable answers*, a high score on this 9 item-test indicates that a child has the tendency to give honest, socially undesirable answers. There was a significant difference ($p= .00$) between the two conditions. Children in the CASI-condition gave slightly more undesirable answers (mean= 30.6) than children in the PAPI-condition (mean= 29.9). The standard deviations did not differ between conditions.

Regarding *openness* and *self-disclosure* we looked at the answers on both the bullying test and the victimization test. Children in the CASI-condition reported that they were actively involved in more bullying than children in the PAPI-condition (p= .00). The mean score for the CASI-condition was 30.5, while the mean score in the PAPI-condition was 27.7. In the CASI-condition also more victimization was reported (p= .00). The mean score on the victimization test was 26.4 for the CASI-condition and 23.1 for the PAPI-condition. Again standard deviations did not differ between conditions.

Besides data quality, *costs* are an important factor too. Cost comparisons are always difficult. To give a fair comparison we calculated the costs we made, and compared this with the costs we would have made if we had done the same survey by paper-and-pen. The costs of sampling, of developing the questionnaire, and of keeping account of the returned questionnaires are not taken into account; these would have been approximately the same in both cases. In the CASI-case we included costs for acquiring the CI3-program, for computer disks, programming, staffing the help-desk and mailing. For the paper equivalent we include printing and mailing costs using the cheapest mailing procedures. We also included the costs for data entry and coding. For the DBM-procedure the total costs were $1.01 for each completed questionnaire, in the paper mail survey this would have been about $ 3.22.

In sum, we showed that:
1). A Disk-by-Mail survey can be successfully implemented in Dutch primary schools.
2). Children from the age of 8 years on can successfully complete a computer assisted self-interview, and enjoy it.
3). Data quality in the computer-assisted group was better than in the paper and pencil group
4). DBM results in less costs for each completed questionnaire compared to a PAPI mail survey.

4. A mixed-mode CAPI and CASI survey of visually impaired and blind adolescents and young adults[3]

The second challenge was a study of blind and visually impaired adolescents and young adults (aged 14-24). In total, 354 respondents scattered over the Netherlands had to be interviewed about their personal network, experienced social support, feelings of loneliness and self-esteem, well-being, and handicap-acceptation. This resulted in a complex questionnaire of more than 260 questions.

Especially the questions on the ego-centered network are very complex for interviewers to administer. First, every important network member in specific domains (e.g., family, friends, neighbors) have to be enumerated. This is followed by questions on practical and emotional support for each listed network member. To ease the task of the interviewer and to minimize interviewer error, a computer assisted procedure seemed appropriate. In CAPI (computer assisted personal interviewing) the interview program takes over and handles the questionnaire logic and question flow; interviewer errors are averted and the interviewer has more time to concentrate on the respondent and establish rapport (cf. De leeuw, Hox & Snijkers, 1995).

[3] For more details on the background of the study and first results see Kef, Hox, Habekothé, 1997.

The questions on self-esteem, well-being, and loneliness are of a sensitive and private nature. Therefore, a paper self-administered questionnaire was used in earlier Dutch studies among 'sighted' adolescents and young adults. Because of the highly sensitive nature of these questions and for reasons of comparability, CASI was the best choice for this part of the questionnaire.

For this study a mixed-mode CAPI-CASI survey was the best choice, provided that specific adaptations of the procedures were made to accommodate the special needs of the blind and visually impaired respondents.

4.1. Logistics

A computer version of the questionnaire was developed using CI3. List of persons were used in a roster-function with the network questions, and range checks were defined for most of the questions. Also additional interviewer reminders were programmed in; for instance, when to hand over the computer to the respondent for the CASI part. Some extra adaptations had to be programmed for the CASI-application.

We opted for a 'manual' Audio-CASI. At the time of our survey Audio-CASI equipment was still in the developmental stage (Johnston & Walton, 1995; O'Reilly et al, 1994), and no standard solution were available. We devised the following procedure:
The interviewer handed over the computer to the respondent, making clear by shifting audibly the chair that she could not see the screen or keyboard. The interviewer had the text of the questions in writing and read them out aloud to the respondent, who typed in the answers. To synchronize the text of the question on the screen with the one the interviewer was reading, a series of 'beebs' was programmed to sound after a response was typed in by the respondent. The questions were all rating-scale type, and the respondent had to type in just one numerical key. For the Audio-CASI a special hardboard template was developed to cover the keyboard. In the template the part for the numbers from 1 to 0 was cut out, since it was only necessary to use these keys. At the appropriate places above the keys the hardboard template had both braille and magnified numbers, enabling the respondents to use the keyboard themselves while answering.

To support the respondent's memory, we also developed paper flash-cards with the response-categories used. There were three versions: one with braille, one with a very large magnification and one with little magnification.

The questionnaire and the procedure were pre-tested extensively, using qualitative pretests and a small scale pilot study. Interviewers attended a three day course. Topics were standard interviewer training, handling the laptop, the contents of the questionnaire, an introduction in CAPI and CASI, and the structure of the computerized questionnaire. Very important issues in the training were the special adaptations in the interview and specific skills concerning our target population: blind and visually impaired adolescents. The training included a visit to a special school for the visually impaired.

The questionnaire was implemented on the laptops of the interviewers, together with an automated system for making backups and a virus-scanner. Before the fieldwork started each laptop was thoroughly tested, including the interviewprogram and the back-up facilities. A disk-version of the questionnaire was available as stand-by. The stand-by version was implemented to run on adequately on a diversity of MS-Dos computers; if the interviewer laptop should break down, the respondents own personal computer could be used. During the fieldwork period both laptops and software proved to be very robust. A paper field guide was prepared for the

interviewers. It contained the text of the questions for the Audio-CASI part, a summary of basic interviewer rules, and a short manual summarizing the main computer commands and help with problems. Also, a field manager could be consulted by phone, even at odd hours in the evening and during the weekend.

The fieldwork took five months (March-July 1996). During that period sixteen interviewers travelled all over the Netherlands, each approximately interviewing twenty respondents. An interview, including the CASI-part, took on average 90 minutes.

4.2. Data quality

For obvious reasons we did not have results on a paper questionnaire with which to compare our data. However, we did have several possibilities to check the acceptance of the methods used and the internal validity of the data.

To investigate respondents *acceptance* and to systematically list any problems that may have occurred during the data collection, we had structured interviewer debriefing sessions. As the knowledge of interviewers and the information they possess on the past interviews is often rather diffuse and unstructured, we used concept mapping. This is a qualitative, highly structured method specially developed to extract information and quickly proceed from fuzzy knowledge to an acceptable conceptual framework (Trochim, 1989). Also, available were the results of short evaluations of both respondents and interviewers, completed immediately after the finished interview.

The experiences of the blind and visually impaired adolescents were very positive. In the Netherlands, almost all blind and visually impaired young persons are very familiar with computers. In general, a computer means a lot to these respondents and is not frightening for them. Many respondents asked a large number of questions about the kind of laptop used and the reasons why we used a computer in this study. Our mixed-mode approach created interest and motivated the respondents. CASI gave the respondents more privacy and offered more variation in the interview-situation, while CAPI proved efficient with the complex network questions. The interviewers stressed that it was important to clearly verbally state that they were not looking at the screen during the CASI-part. The hardboard device worked well and the respondents had no difficulties with the typing-in of the answers. Accidentally, some respondents pushed some not-important keys through the hardboard device. Since the questionnaire was programmed to accept only numerical input at this point, this created no problems.

The CAPI-part and its adaptation to the special population did not give any problem, the special cards with response categories in braille and large letter type worked extremely well. Again the interviewers mentioned that it was extremely important to verbalize every action. When interviewing visually impaired, only a limited channel capacity of communication is available (audio and touch). Interviewers had to heavily rely on verbal and paralinguistic communication (e.g., humming in stead of nodding as a positive reinforcement).

To investigate the *internal validity* of the data, we checked missing values, psychometric reliability and interviewer variance. First of all, no *missing values* occurred.

To examine the psychometric *reliability* the responses to the multi-item scales were analyzed. For each multi-item scale Cronbach's coefficient alpha was computed for the whole group of respondents and for subgroups (i.e., blind vs visually impaired). We expected that it would be somewhat harder for the blind to use the CASI-part resulting in somewhat less

consistent answers. This was not confirmed by the data. In the whole group and in the subgroup the multi-item scales had sufficient reliability. No significant differences in reliability of scales were found between sub-groups.

Finally, we investigated whether there were any interviewer effects for the question on network size. Again, we analyzed the data for the whole group and for the blind and visually impaired subgroups separately. Although we expected that the blind needed more assistance, resulting in a larger interviewer effect, this was not confirmed by the data. In fact, no interviewer effects on network size were found for the whole group, nor for the subgroups.

In sum:
1) A mixed CAPI-CASI or CAPI-only approach can be successfully used with visually impaired adolescents and young adults.
2) Given the high level of computer sophistication of Dutch young visually impaired and the fact that almost all own a pc with braille adaptations, a CASI-only survey could be successfully implemented.
3) Acceptance is high. Both interviewers and respondents were positive in their reactions.
4) The special adaptations using braille and Audio-CASI procedures worked well.
5) The combination of computer-assisted data collection and well-trained interviewers results in good data quality.

5. Current Best Methods Plus: Recommendations for computer assisted interviewing of special groups

In a successful survey of special groups adaptations have to be incorporated in the Current Best Methods available for a quality survey: one needs CBM+. Just standard good practice with some adaptations is not enough. With a special group a slight error in the questionnaire or procedure is more difficult to compensate; its influence will be magnified and data quality will suffer more than usual. To optimize data quality, the best practices in survey research, computer technology, and adaptations to the group should be combined into one total survey design aiming at Total Quality Management. Main points in CBM+ are: 1) optimize the design by pre-analysis of goal of study, group to be surveyed, and logistics; 2) optimize questionnaire and proceedings by using the CAI-potential fully 3) check the TOTAL design by pretests of questionnaire, implementation, and procedures; 4) build in repairs for the rare cases that errors will occur. A CBM+ system is 'fool'-proof, and when the fool beats the system, there is a repair mechanism. We want to stress that CBM+ can implemented using existing, flexible software, such as Sawtooth CI3. We will give some examples.

5.1. Optimizing the design.

The most important step here is a systematic analysis of the group. Points for consideration are:

- development of cognitive skills of the respondent (e.g., different stages in children, elderly)
- available channel capacities in interview (audio, visual & paralinguistic)

- social customs (social customs may differ)
- hazards to eye-hand coordination (e.g., hospital patients)
- computer literacy
- easy access to computers, either their own or a company or school computer
- ease of safely providing the members with a computer on a temporary basis (e.g. have a computer delivered with some instruction for a key contact at a hospital)
- availability of key contacts as help to introduce the survey (e.g., a teacher, a trained matron in a hospital ward, a social worker)

Some examples: In Audio-CASI, the audio- and paralinguistic channels are most important to convey information. In some cases respondents have to rely on the audio channel only, making CASI resemble more CATI closely. The extensive research on CATI and data quality shows that only a limited number of response categories can be used. In our survey of the visually impaired we used Audio-CASI, combined with braille cards for the response categories to compensate for the limited channel capacity. When Audio-CASI is used one should use all channel capacities and have the text on screen in large letters too. Using both channels reduces the risk of information loss. In studies with very young children and illiterates it is wise not to rely on the visual channel and use questions with a limited number of response categories.

The survey of school children is a good illustration of the use of a key person on the spot to assist in the data collection. Another, example is an evaluation study with hospital patients. As the questions were rather sensitive, the research firm decided to use CASI. A representative of the research firm visited the hospital with a laptop and gave some basic instructions to the matron or executive nurse. The matron could bring the laptop to a patient at an optimal time for hospital and patient and start the interview-program. Only very simple keystrokes were necessary to answer questions and screen contrast was heightened to enable using the laptop en bed.

5.2. Using CAI-potential fully

The strength of computer assisted interviewing is that intelligence can be built into the program. A very complex questionnaire, with checks of answers, complicated branchings, and randomization of response categories can be used safely. However, it is important that the questionnaire appears logical and simple. The magic word is **appear** simple and logical. What is seen on the screen should be simple, what happens in the program may be complex! The designer, programmer, and tester of the questionnaire may get headaches in solving problems, the respondent may not! These principles should be combined with CBM in questionnaire construction.

In constructing a CAI survey for special groups one should bear in mind that:

- The questionnaire should be experienced as simple and short and structured to compensate for fewer cognitive skills and smaller channel capacity.
- Point of reference is always the respondent, what is easy and logical for the respondent is not necessarily logical or easy for the questionnaire designer.
- Group questions in a logical order, use blocks of questions, use the same question format as far as possible, etc.

■ Perceptual and motor skills necessary for responding to a computer assisted questionnaire are slightly more complicated and take somewhat more time than those necessary for paper-and-pen tests.
■ Question texts are harder to read on a monitor than on paper, which implies that ergonomical text presentation and careful screen design is important
■ Easy key-stroke combinations should be available for answering. Respondent burden should be minimalized.
■ Avoid mistakes, if possible use templates to cover keys that are not necessary or even 'dangerous'
■ Avoid any suggestion of time pressure, especially with inexperienced users. If eye-hand coordination is expected to be sub-optimal, allow for extra time.
■ Respondents should be able to concentrate fully on the questions, they should not be distracted by extra tasks.
■ When interviewers or 'helpers' on the spot are used, do not leave the solving of problems to the interviewer. Interviewer burden should be minimalized by well constructed and tested questionnaires. Interviewers need their attention for the special respondent NOT for the computer.
■ Everything a system can do it should do. For instance, starting the questionnaire, making back-ups, keeping administrative records, stopping and resuming at the right point.

5.3. Pretest and check

Often there is not enough time and/or money to do extensive pretests and run a full pilot study. This should not be an excuses for omitting pre-testing altogether. Carefully planned, small scale pretests can be easily implemented at low costs. Qualitative, or cognitive, interviews with a small number of real respondents can detect many errors in the basic questionnaire. Dry-runs, after the programming, can be performed in-house. Observation of a respondent, in combination with in depth interviewing after the performance is a good method for testing the implementation.
In short:

■ Pretest the questionnaire: does the respondent understand the meaning of the question, the meaning of terms used, the response categories. This can be done early with the paper version.
■ Pretest routings (no respondents needed).
■ Pretest the computer implementation (e.g., starting-up, making back-ups). After technical tests in-house, let a naive respondent try it out.
■ End with a useability test on the final product. Check user-friendliness of system, but also screen lay-out, use of special keys, etc.

5.4. Build in repairs

Prevention is better than curing. But sometimes.....

■ Internal checks on 'out-of-range' answers and consistency checks are almost automatically employed in CAI. When employing these one should keep in mind, that a check alone is not all; the following message on screen should be clear to the respondent too!.

■ Have a short list on paper with instructions and meta-information. When something goes wrong, help-functions or help-key often only confuse the flustered respondent. Use larger than standard letter-type without serif (e.g. Helvetica 20)

■ Have a help-desk manned or use informed key-persons in the vicinity as 'help'

■ Make sure 'first-aid' diskettes are available with a complete back-up of the questionnaire. Either with the key-persons or at the help-desk to be mailed out immediately.

5.5. Conclusion

DBM+ just asks a little bit extra. Most importantly is a systematic approach. Analyze the research problem and adjust your study accordingly. The above lists aid in the analysis and implementation of adjustments. It is not necessary to have software developed, quality standard software can be used to accommodate your special survey. The new developments in multi-media systems, using sound and video, will increase the power of the tools available for surveying special groups.

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