Screen Design Guidelines for Blaise Instruments

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1. Introduction

Many survey organizations now recognize the need for computer assisted interviewing (CAI) screen design guidelines for Blaise programming. Like many, the Survey Research Center (SRC) at the University of Michigan has developed a set of screen design guidelines. Originally developed in 2000, these guidelines were based on key principles taken from Human-Computer-Interface (HCI) research, which include:

- consistent screen design
- visual discrimination among the different elements (so that CAI users learn what is where, and know where to look)
- adherence to normal reading behavior (i.e., start in upper left corner)
- display of instructions at points appropriate to associated tasks (e.g., the show card or respondent booklet instruction precedes the question and the entry instruction follows the question)
- elimination of clutter and unnecessary information or other display features (e.g., lines and toolbars) that distract users from immediate tasks

The original SRC guidelines specified text font and colors (for questions, response categories, and instructions), the placement of help indicators and instructions, the formatting of variable text and error messages, and so on. Several attempts to apply the guidelines, however, revealed that there were many instances in most questionnaires in which specific guidelines could not be applied consistently.

The guidelines underwent extensive revision during the course of redesign of an existing survey instrument. During that process attempts were made to consistently apply current principles, and to refine them when they were shown to be inadequate. The result is a more extensive set of proposed guidelines that can apply more broadly to the survey instruments SRC develops.

This paper summarizes the major issues faced during the redesign, and provides an overview of the new guidelines with numerous examples of redesigned screens. Major additions include guidelines for “interviewer checkpoints” (non survey question screens), multiple part questions (e.g., MM/DD/YYYY), and design of probes and data entry instructions.

2. Developing CAI Screen Design Guidelines

Good CAI screen design respects the natural flow of the user's tasks. It should make the interviewer or respondent more efficient, prevent errors, and reduce training or retraining needs, through making required tasks obvious. On seeing a screen for the first time, the user's eyes immediately should be drawn to the key features of the screen for successful delivery of the survey question and recording of the response. Ideally, a relatively untrained interviewer or respondent seeing a particular screen for the first time should be able to distinguish the action items from the information items, and know what the immediate task should be.

The question is the most important feature of the CAI screen, and it should be the most visible element of the screen, immediately identifiable. In addition, different question types and response input formats (for example, currency, dates, grids, and open text), and other elements of the screen (for example, response options, on-line help indicators, and section and other context information) should all be formatted consistently. Keeping in mind these guidelines and the HCI principles previously mentioned, SRC outlined basic Blaise screen formatting guidelines in early 2000, and have revised them over time, based on attempts to apply them in the development of various survey instruments.

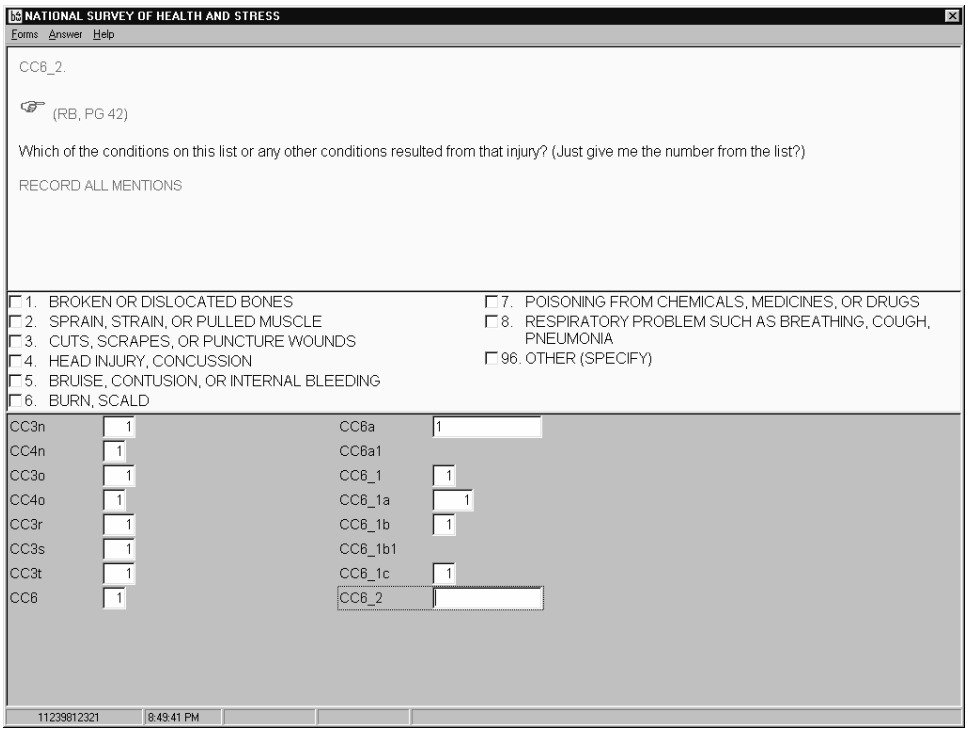
One of the lessons we repeatedly have learned is that we do not always have control over screen design, particularly when current instrument development relies heavily on previously designed questionnaires. This is particularly a problem with longitudinal or panel surveys, or surveys that use modules in whole from other surveys. Examples are the U.S. Health and Retirement Survey (HRS), the World Mental Health survey (WMH), and surveys that use WMH components, such as the U.S. National Survey of Health and Stress.

Figure 1 shows a screen from a survey developed prior to SRC's 2000 guidelines, in which instructions and response options appear in upper case. Prior to the use of Blaise for Windows at SRC, CAI instruments that were developed in DOS-based systems, with limited screen text options, displayed all interviewer instructions and response codes in upper-case or capitalized text. This followed long-standing SRC guidelines for paper-and-pencil surveys. Early surveys in Blaise tend to use these same conventions.

This screen has other features of early SRC surveys in Blaise: (1) the question identifier (CC6_2) appears at the top of the screen, which clutters the screen; all text, whether instruction or question text, is flush with the left margin; and (3) the respondent booklet instruction appears below the question identifier, distinguished by the "pointing finger" icon, rather than being the first thing the interviewer focuses on. Later guidelines suggested eliminating the question identifier from the top of the screen, since it was also displayed in the form pane, indenting instructions that followed the question, to further distinguish them from the question, and providing a clearer respondent booklet instruction (see Figure 3 in the "Examples" section).

Another lesson repeatedly learned was that our guidelines were not comprehensive enough to cover a great many design decisions questionnaire specification writers and instrument programmers had to make in real life. This was particularly true for display of the many types of interviewer instructions that researchers asked programmers to place on the CAI screen.

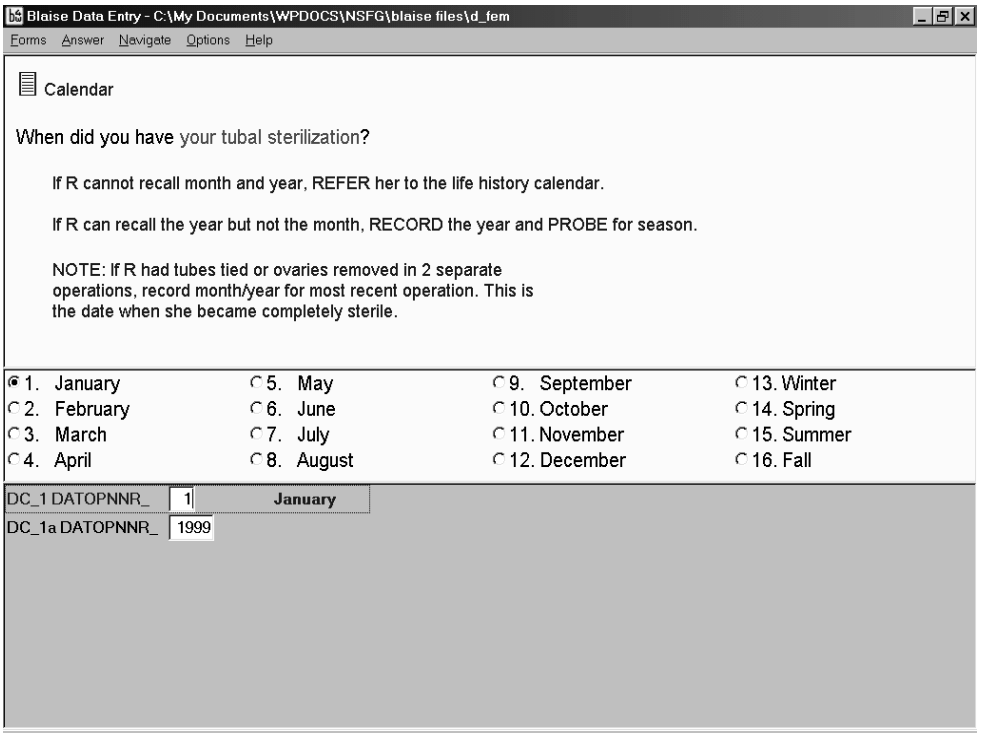
Figure 1. Screen formatted using basic screen design guidelines



The SRC 2000 screen guidelines recommended avoiding the use of capitalization, large blocks of which are hard for the interviewer to read. Other basic guidelines were to display question text in 12 point Arial black, and instructions in 11 point Arial blue, capitalizing only action verbs in instructions (for example, ENTER). Such limited use of capitalization was designed to draw attention to the task involved, and to help the interviewer locate a particular instruction type quickly. Figure 2 provides an example of how this guideline was applied in the National Survey of Family Growth (NSFG).

It is obvious in this example that capitalizing any and all action verbs anywhere in an instruction defeats the purpose of the capitalization. In some cases, the capitalization draws the interviewer's attention away from the primary focus of the instruction. This is the case with "REFER" in the first instruction, in which the interviewer's attention is drawn immediately to the action verb, rather than the important conditional clause. Seeing such actual applications of the guideline to capitalize action verbs in instructions led to a new guideline that suggested capitalization of a limited set of verbs associated with key interviewer tasks, for example, ASK, READ, PROBE, and ENTER, and to use capitalization only if the verb appeared at the beginning of the instruction.

Figure 2. Example of old guideline to capitalize action verbs in instructions



After review of several CAI instruments in May 2002, SRC decided to update the guidelines, making them clearer, more comprehensive, and easier to apply, and ensuring consistency within and across instruments. The first application of the guidelines was to a newly revised WMH instrument that was to be modularized for easy insertion of components of the survey into other surveys. Using the guidelines in revising a complete instrument helped identify gaps in the guidelines and areas of potential misapplication. The next sections outline some of the resulting proposed changes to the SRC Blaise screen design guidelines, and give examples of how they were applied to the WMH instrument.

3. Basic SRC Blaise Screen Design Guidelines

Following are key elements of the SRC guidelines currently under revision.

Basic text characteristics

Make the question the dominant element on the screen. Provide sufficient contrast between the question and related text and other elements of the screen:

- question text: light background color (cream) and dark text (mixed case, 12 point Arial, black)
- instructions: smaller font in color (11 point Arial blue)
- response categories (answer lists): use same conventions as for question text
    - categories that could be read to the respondent are 12 point Arial black
    - categories that would not be read to the respondent are 11 point Arial blue

Additional text characteristics

- use underline for emphasis, sparingly
- (place optional text in parentheses)
- place in text references to numbers computer keys to type in mixed case within square brackets, for example
  [Enter], [1], [F12], [Ctrl-R]

Elements of the screen

Place elements in the order in which the interviewer would need to attend to them, according to interviewing task demands. For example, a show card instruction precedes the question, and a probe instruction follows the question but precedes an entry instruction.

- references to interviewer aids (such as event history calendar or show card) and question appear in the upper left corner of the screen
- instructions that follow the question are indented
- a question-level help indicator ([F1]-Help) appears above the question on the right margin

Additional instruction guidelines

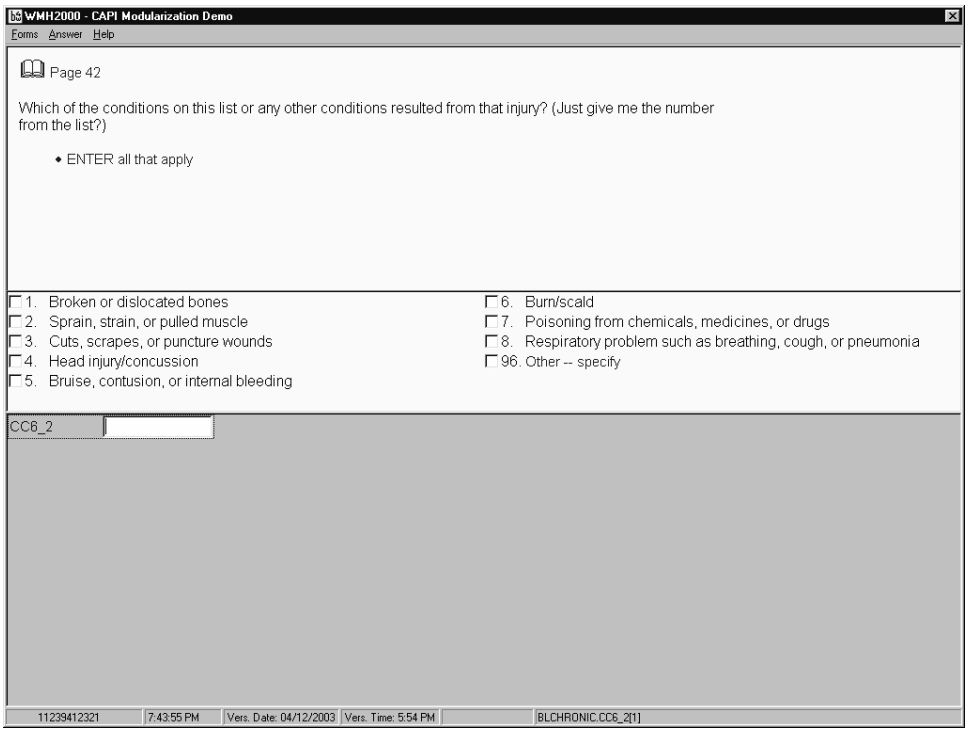
- "bullet" individual instructions with a small blue diamond
- display in order associated with required interviewer tasks
- instructions that precede the question are flush left with the question
- instructions that follow the question are indented
- use icons to distinguish special instructions
  - e.g., 🕮 Page 1, for respondent booklet instruction, 📄 Calendar, for event history calendar instruction, and ☑ Interviewer checkpoint
- include an actual question in interviewer checkpoints
- capitalize only key task-related action verbs, (ASK, READ, ENTER, PROBE), only at the beginning of instructions
- single space within an instruction, double space between instructions
- keep instructions simple and concise
  - put long instructions or those not directly related to asking questions or entering responses into online help
- conditional instructions start with the conditional phrase, not the action verb, and the action verb is not capitalized
- in probe instructions, place text to be read in Arial black
- place references to respondent answers in quotation marks

4. Examples

Basic screen design

Figure 3 shows a typical question formatted according to the new basic screen design guidelines. It is the same question shown in Figure 2. In this version, the respondent booklet instruction has been simplified, with a new booklet icon, and a clearer page reference, Page 42 rather than (RB, PG 42). The entry instruction is bulleted, in mixed case, with the action verb "enter" capitalized. It is also indented to further separate it from the question text, which is the primary focus of the screen. The response options are mixed case, with the "other – specify" code in blue. This follows the guideline to place only text that could be read to the respondent in Arial black--although the interviewer is not required to read response options, she would have to if the respondent were having trouble reading the respondent booklet.

Figure 3. Question designed using new guidelines (as compared to Figure 1)



Conditional instructions

The greatest limitation of the original screen guidelines was the very basic convention of displaying instructions in mixed case in blue, not bulleted, with just a few simple guidelines about specific types of instructions. This turned out to be completely inadequate for a large number of instructions that appeared in the WMH instrument, particularly for probe and entry instructions. One problem was that discussed earlier (Figure 2), a capitalized action verb drawing the interviewer's attention away from the primary focus, which was the condition for the action. This led to guidelines for conditional instructions. Figure 4 shows an example of a question with a conditional probe instruction formatted under the new guidelines, and Figure 5 shows conditional entry instructions.

Figure 4. Question with conditional probe instruction

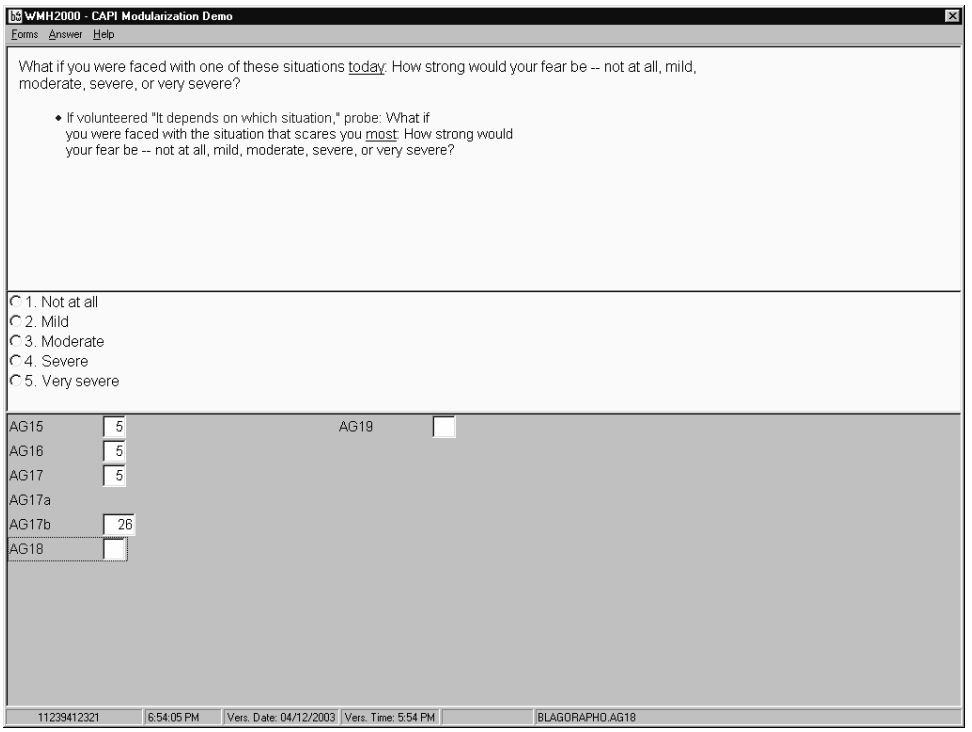


Figure 5. Question with conditional entry instruction

The conditional probe instruction starts with the condition, "If …," and does not capitalize the verb "probe," so that the interviewer's attention will not be drawn away from the condition. The referenced respondent answer appears in quotation marks, meant to help the interviewer quickly focus on the actual condition under which she would have to probe. Probe text is provided in Arial black, indicating that it is to be read verbatim to the respondent. Similar conventions are used for the conditional entry instruction (Figure 5), with what the interviewer is to enter, under the specific condition, placed in square brackets. This example also follows

the guideline that keys and function keys that the interviewer is to type are always placed in brackets, and helps the interviewer to quickly focus on what to enter under the specified condition.

Interviewer checkpoints

In many CAI surveys there are items that ask for information from the interviewer, in order to program the subsequent flow of the interview or to tailor the display of subsequent items. Previous SRC guidelines did not address how to handle such "interviewer checkpoints." As a result, such items were formatted in a variety of ways across SRC surveys, and most did not actually ask the interviewer a question. Figures 6 and 7 provide "before" and "after" examples of an interviewer check-point.

The old version of the item has upper case text that is neither an instruction nor a question, and the interviewer is left to determine what must be done at the screen. The new version use the new checkpoint (☑) icon, followed by "Interviewer checkpoint". This provides both graphical and text clues for the interviewer that this item is not a question to be read to the respondent. There is a question, but it is displayed in blue, also indicating that it is not to be read. Response categories are also in blue, reinforcing that this is not a survey question.

There are some screens that are neither interviewer checkpoints nor survey questions. They display information for the interviewer to review, or instructions to the interviewer prior to proceeding in the interview. Figures 8 and 9 show "before" and "after" examples of such an item.

In this item there are three statements or instructions, which appear in Figure 8 in upper case, not bulleted, and therefore not clearly distinguishing three separate instructions. The first displays filled text that gives the name, age, and gender of the selected respondent. The others are instructions for what to do if the information is incorrect, and what to do if it is correct.

The redesigned screen in Figure 9 makes these three distinct bulleted statements or instructions, and separates and indents the filled text, so that the interviewer can quickly focus on it when the screen is displayed. The final instruction, which originally seemed unrelated to the response option, was changed to the more appropriate "ENTER [1] to continue."

Figure 6. An interviewer checkpoint before guideline revisions

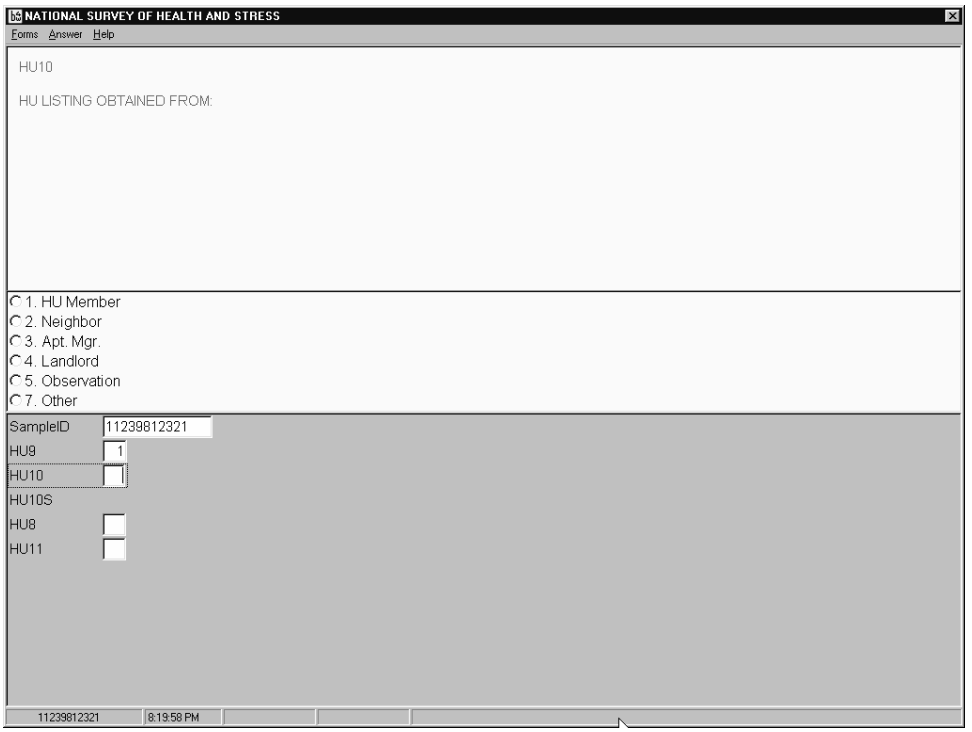


Figure 7. An interviewer checkpoint after guideline revisions

Figure 8. Interviewer confirmation screen before guideline revisions

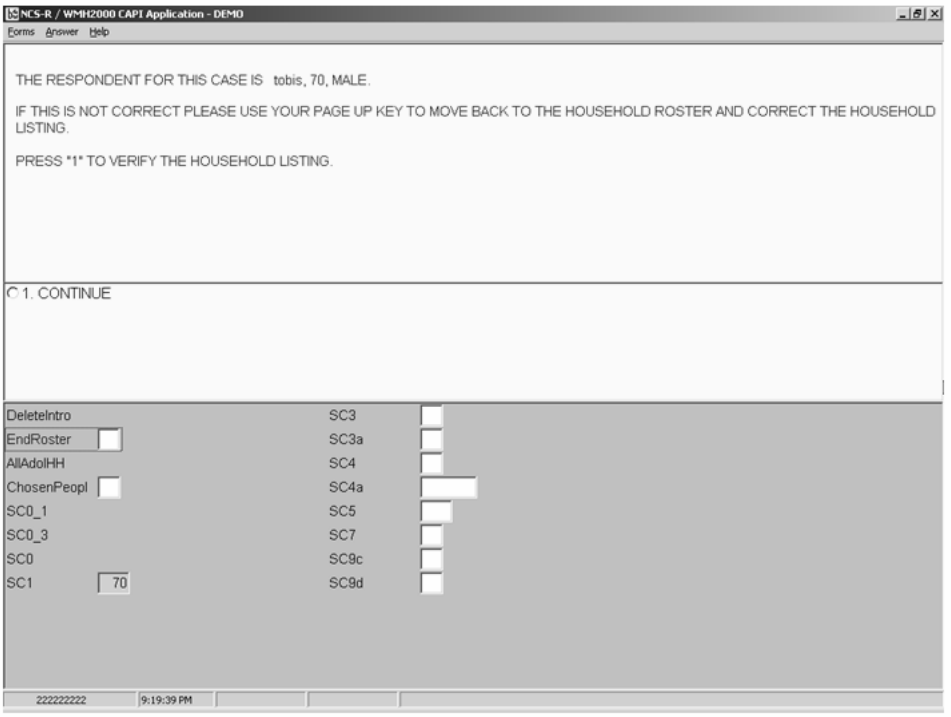
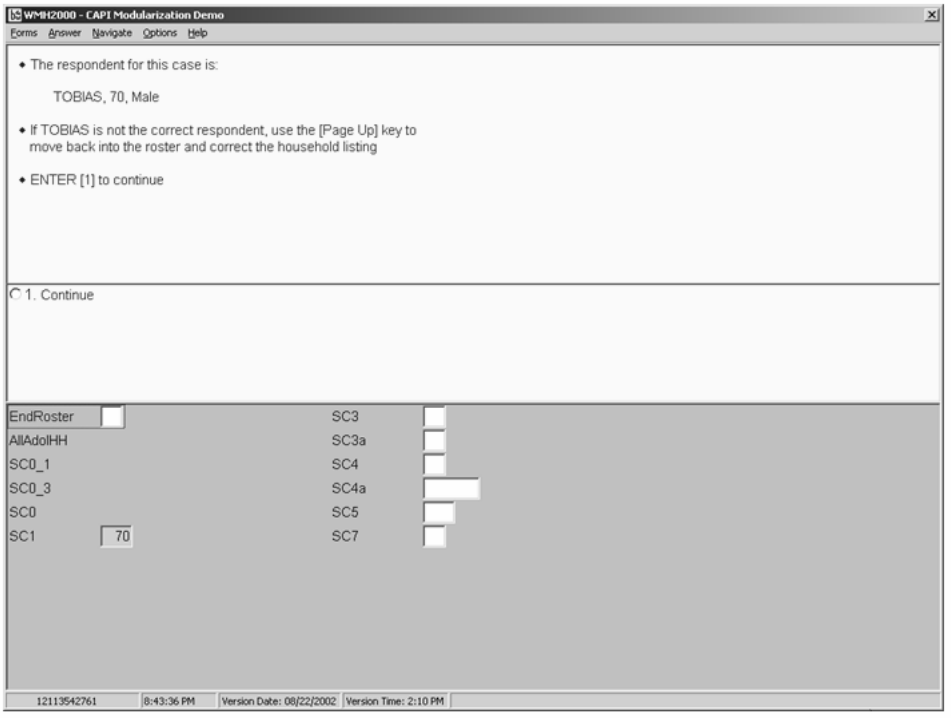


Figure 9. Interviewer confirmation screen after guideline revisions



Multi-part questions

Some questions require entry of multiple items for one response. For example, "What is your date of birth?" requires entry of month, day, and year. SRC refers to these as multi-part questions. The SRC 2000 guidelines did not provide recommendations for such questions. A usability evaluation of the National Health Interview Survey suggested that a screen design in Blaise that facilitates the interviewer associating the parts of such multi-item questions can lead to greater

usability of the instrument and improved data quality (Hansen 2003). Therefore, the SRC proposed guidelines make a recommendation for screens for multi-part questions.

Figures 10 and 11 shows "before" and "after" examples of the first part (feet) of a multi-part question, "How tall are you?" Figure 12 shows the "after" example of the second part of the question (inches). There is no information in original version of the question (Figure 10) that indicates that the item is the first of two associated with the actual question, except with the "RECORD FEET FIRST" part of the capitalized instruction, which is hard to read. In the revised counterpart (Figure 11), the first thing the interviewer sees on entering the screen is ① of ② , indicating that there are two parts to the question. In addition, ___**feet** and inches follows the question, with the boldfaced blank and "feet" indicating that this part calls for entry of how tall, in feet. The first thing the interviewer sees on the second question part is ② of ②, and 6 feet **and** ___ **inches** follows the repeated question, associating it with the prior item, but in parentheses to indicate reading it is optional.

Figure 10. Example of first part of multi-part question before guideline revisions

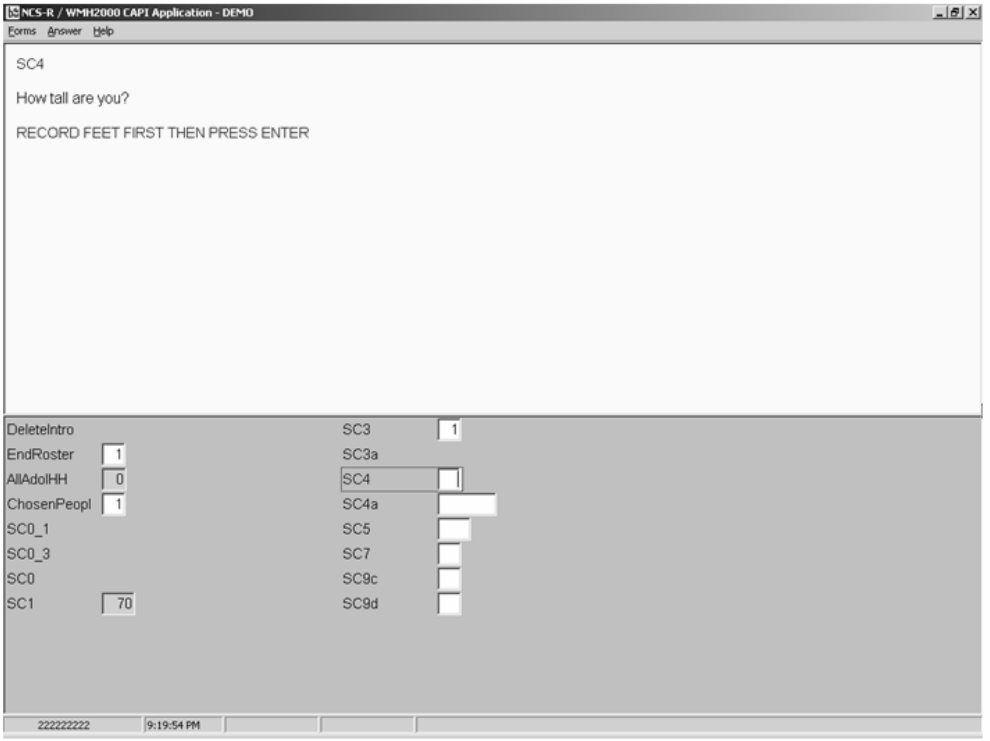


Figure 11. Example of first part of multi-part question after guideline revisions

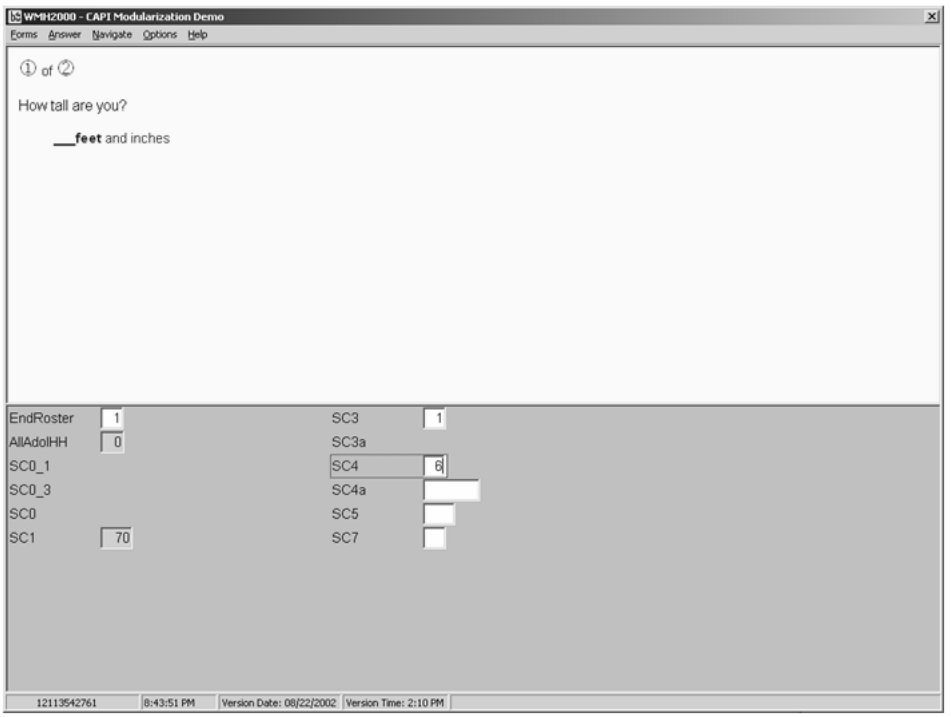
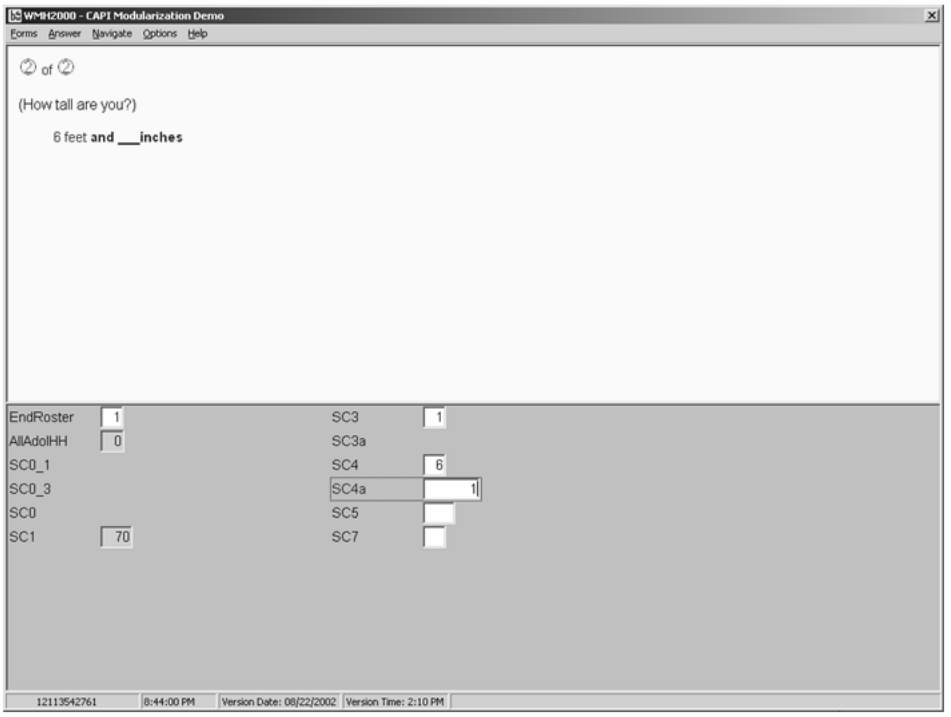


Figure 12. Example of second part of multi-part question after guideline revisions



5. Summary

Developing comprehensive screen design guidelines for programming CAI instruments has been an iterative process, evolving as we gain experience programming instruments in Blaise. This process has been enhanced by communication with other Blaise users, which has led to adoption of conventions used in other organizations that have design guidelines (for example, the U.S. Bureau of the Census and Statistics Canada). We hope that the discussion and

examples presented here will help other organizations think about the application and possible future enhancement of their own guidelines.

Such guidelines are meant to improve CAI screen design, making it easier to program consistently designed screens and survey instruments, and making it easier for respondents and interviewers to use those survey instruments and to record quality data. The SRC proposed guidelines are currently under review, and may change further. We will be happy to share them with other organizations when they are complete. We also welcome comments and suggestions for improvements.

6. Reference

Hansen, S.E. (2003). "Evaluation of the 2003 Redesigned NHIS Blaise Instrument: Results of a Usability Test." Report Submitted to the National Center for Health Statistics. Interface Design Group, Survey Methodology Program, Survey Research Center, University of Michigan.