

The Three-Legged Stool Is Now a Four-Legged Chair: Specification Guidelines for Blaise Survey Instruments

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1. Introduction

Much has been written and presented in past International Blaise User Conferences about the integration and use of good screen design, programming guidelines, and consideration of data analysis and documentation requirements; the three-legged development stool (Couper 2000). Believing that instrument design and cost effective Blaise programming is facilitated by good instrument specifications. The University of Michigan's Survey Research Center (SRC) has put a considerable amount of effort into developing standards for creating specifications for Blaise survey instruments.

Between 1999, when SRC started programming instruments using Blaise, and completion of the guidelines in 2007, there was wide variation in the quality of specifications provided to SRC programmers, which generally reflected each survey manager's style, experience, and time available to develop specifications. There were some general rules of thumb that were followed; but, in many ways, it was like the Wild West when it came to how specifications for Blaise survey instruments were written. Adherence to screen design standards and programming standards was marginal at best.

In 2007, a proposal was written and funded to develop and publish a book of standards for use in the Survey Research Center that encompassed all of the items listed above; screen design, programming, data documentation, and finally writing specifications for Blaise survey instruments.

This paper will discuss the development of that publication and the specifications chapter in particular. Besides discussing the process and content of the book, samples of it will be included as well as a discussion on the desire to design an experiment which would measure and confirm the accumulating anecdotal evidence of decreased Blaise programming costs and errors since the publication of the book.

2. Early Days of Specifying for Blaise Survey Instruments

In SRC experience with programming Blaise instruments, the quality and cost of Blaise programming has been directly affected by the length of the development period, the hours budgeted for programming, and the quality of the instrument specifications. In the early days of SRC Blaise programming, programmers started with either a legacy questionnaire, many times the old "box and arrow" questionnaire itself, or specifications in the form of a questionnaire produced by the survey manager, in a format she was comfortable producing, often with little understanding of the requirements of computer-assisted survey instrumentation or Blaise.

In the absence of a coherent set of guidelines for specifying Blaise survey instruments, many survey managers were left to their own devices in terms of what they prepared and delivered to the CAI programmer to be developed into a Blaise survey instrument. This practice, depending on the survey manager and CAI programmer involved, would often lead to inconsistent design, poor communication, many programming iterations, a more arduous testing period, and higher costs to the project in terms of programmer, tester, and the survey manager time. In addition, there was often inconsistency in screen design across instruments, which affected users (interviewers). Projects programmed by different CAI programmers would literally have a different look and feel. This result could hinder the interviewer's efficiency because of the subtle but significant differences in the screens and behavior of the application. Below, are some examples of specifications used prior to the publication of the SRC Blaise Standards.

2.1 Specification Examples Pre-Standards

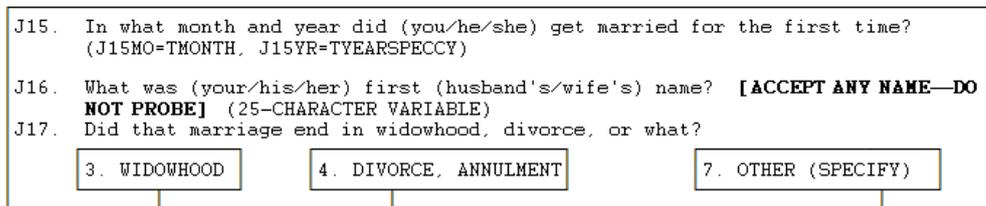
Here are two early examples of specifications used to program Blaise applications. This type of specification closely resembles a “box and arrow” survey instrument.

2.1.1 Example A

J12a. AQSN OF THIS PERSON
 J13. INTERVIEWER CHECKPOINT (VARNAME=J13CKPT)



J14. [INCLUDE THIS SENTENCE ONLY FOR VERY FIRST ITERATION THROUGH SECTION J: Now I'd like to ask about (your/his/her) family history.] Altogether, how many times (have you/has [he/she]) been married? (TWO DIGITS)



J18. In what month and year (were you/was [he/she]) widowed? (J18MO=TMONTH; J18YR=TYEARSPECCY)

J19. In what month and year did (your/his/her) (divorce/annulment) become final? (J19MO=TMONTH, J19YR=TYEARSPECCY)

J20. In what month and year did (you/they) stop living together? (J20MO=TMONTH, J20YR=TYEARSPECCY)

J21. In what month and year did (you/he/she) (last) get married? (J21MO=TMONTH, J21YR=TYEARSPECCY)
 J22. What was (your [husband's/wife's]/his wife's/her husband's) name? **[ACCEPT ANY NAME—DO NOT PROBE.]** (25-CHARACTER VARIABLE)
 J23. INTERVIEWER CHECKPOINT (VARNAME=J23CKPT)



J24. In what month and year (were you/was [he/she]) widowed? (J24MO=TMONTH; J24YR=TYEARSPECCY)

J25. In what month and year did (your/his/her) (divorce/annulment) become final? (J25MO=TMONTH, J25YR=TYEARSPECCY)

GO TO KIDS

J26. In what month and year did (you/they) stop living together? (J26MO=TMONTH, J26YR=TYEARSPECCY)

2.1.2 Example B

R1. Now I would like to ask you a few questions about help you might have received two years ago. At any time during 2001, even for one month, did (you/anyone in this family) receive any public assistance or welfare payments from the state or local welfare office? [IWER: DO NOT INCLUDE FEDERAL FOOD STAMPS OR SSI. DO INCLUDE ADC, AFDC/TANF, GENERAL ASSISTANCE PROGRAMS, EMERGENCY ASSISTANCE, CUBAN/HAITIAN REFUGEE, OR INDIAN ASSISTANCE.]

1. YES

5. NO ———GO TO R7

R2. Who received that public assistance or state or local welfare in 2001?
(TWO-DIGIT MULTIMENTION: AQSN OF EACH SUCH PERSON. IF DK/RF, GO TO R7)

R3. In which state was (PERSON IN R2) living at the time (he/she) received that public assistance? (TWO DIGITS: R3STATE USING TSTATE)

R4. Which type of public assistance did (you/PERSON IN R2) receive? (Any other?)
[ENTER ALL THAT APPLY]

1. (STATE-SPECIFIC ASSISTANCE-- SEE LIST)

2. ADC/ AFDC

3. GENERAL ASSISTANCE

4. EMERGENCY ASSISTANCE

5. CUB./HAIT. REFUGEE

6. INDIAN ASSISTANCE

7. OTHER (SPECIFY)

ASK R3-R4 FOR EACH PERSON MENTIONED AT R2

R5. How much did (you/everyone in your family) receive altogether from all of the public assistance or welfare programs you just mentioned during 2001? (TWO VARIABLES: R5YRAMT AND R5MOAMT, EACH 7 DIGITS)

R6. During which months did (he/she) receive any type of public assistance or welfare during 2001? (MULTIMENTION: R6x, USING TMOSTRING)

R7. At any time during 2001 did you (or anyone else in your family living there) receive Supplemental Security Income?

1. YES

5. NO ———GO TO R11

R8. Who (in the family) received Supplemental Security Income?
(TWO-DIGIT MULTIMENTION: AQSN OF EACH SUCH PERSON.)

R9. How much did (you/he/she) receive altogether from Supplemental Security Income during 2001? (TWO VARIABLES: R9YRAMT AND R9MOAMT, EACH 7 DIGITS)

R10. During which months of 2001 did (you/he/she) receive it?
(MULTIMENTION: R10x, USING TMOSTRING)

ASK R9-R10 FOR EACH PERSON MENTIONED AT R8

The next two examples of specifications begin to show signs of the progression towards what would become the standardized format. The improvements included listing out each question in a top-down style instead of questions all over the page with routing implied by boxes and lines or arrows. Each question also possessed its own coding format and routing instructions.

2.1.3 Example C

V10. Altogether, how many nights were you a patient in the hospital in the last year?

_____ (Number of times)

998 = Don't know

999 = Refused

➤ VALID CODES: 1-365

➤ "SOFT" CONSISTENCY CHECK: IF IWER ENTERS NUMBER GREATER THAN 60, ASKIWER TO VERIFY THE ENTRY.

➤ ANSWER TO V10 MUST NOT EXCEED ANSWER TO V7.

V11. Were the costs for your hospital stay(s) completely covered by Medicare, Medicaid, or other health insurance, partly covered by insurance, or not covered at all by insurance?

1 = Fully covered

3 = Partly covered (or covered with a copay)

5 = Not covered at all

7 = [IF VOLUNTEERED:] Costs not settled yet

8 = Don't know

9 = Refused

V12. In the last two years, have you been a patient overnight in a nursing home, convalescent home, or other long-term health care facility?

1 = Yes (Go to 13)

5 = No (Go to 19)

8 = Don't know (Go to 19)

9 = Refused (Go to 19)

2.1.4 Example D

GLOBAL PROGRAMMING ATTRIBUTES:

Allow global DK and RF on all fields unless otherwise specified

Do not allow EMPTY on any fields

Consistency checks only where specified

Standard SRO formatting guidelines on all screens

VOL STMT

Voluntary Statement

[^Display Respondent Name](#)

A few months ago you participated in a study of social relations. We would like to thank you once more. We are calling you with some follow up questions. This should only take about 10 minutes.

As in the previous interview, your participation is completely voluntary and confidential. If we should come to any question you do not want to answer, let me know and we'll go on to the next question.

[Enter \[1\] to continue](#)

Question Type: Numeric; Range 1-1

A3.

People do different things to help them cope with life events. We'd like to know what you did to cope with the event or problem you experienced. Did you do any of the following?

- A3a. take any specific action to try to solve the problem
- A3b. do something to help you relax
- A3c. distract yourself by thinking about other things or engaging in some activity
- A3d. try to see the event in a different light that made it seem more bearable
- A3e. express emotions to reduce your anxiety, frustration, or tension about the event
- A3f. seek spiritual support or comfort concerning the event
- A3g. seek emotional support from loved ones, friends, or professionals concerning the event

CORE_NETWORK

A4

Which two people helped you the most during this event?

PROBE FOR TWO MENTIONS. IF EITHER PERSON NAMED IS A PROFESSIONAL SERVICE PROVIDER (e.g. DOCTOR, PHARMACIST, SPIRITUAL LEADER) ASK R TO NAME SOMEONE WHO IS NOT A PROFESSIONAL SERVICE PROVIDER)

PERSON 1 string 25
PERSON 2 string 25 (allow empty if no second mention)

**programmer - we want to loop through the A5-14 for each person mentioned at A4.*

2.2 The Development of SRC Blaise Standards

Prior to initiating the project in 2007 to create a set of standards for screen design, programming, documentation, and specification, a variety of documents and guidelines existed in many places and were of varying age and quality.

In an effort to consolidate and update all of these documents, the SRC Blaise Standards were conceived. For the first time, an importance was assigned to making these standards a cogent and useful tool for programmers, specification writers, survey managers, researchers, and testers.

It was believed that by standardizing the look and format of instrument specifications, they could become a single resource for a wide range of users throughout instrument development, data collection, and data documentation. Thus, the new standardized specifications became a useful document and communication tool for all phases of the survey lifecycle.

Following are short examples of delivered specifications that were written to conform to the SRC Blaise Standards for specifying a Blaise survey instrument. Section 2.2.1 shows a portion of the original specification delivered for programming. The same portion of specifications as re-written to conform to the new standard is displayed in section 2.2.2. Section 2.2.3 shows another example of specifications based on the new standards.

2.2.1 Original Non-Standard Specification

Section 12: Self Beliefs

The following is a list of statements that you may or may not identify with. Read each statement carefully. Then, using the scale shown, please rate the extent to which you identify with the statement and select that box.

Response scale: 1 = not at all like me -- 7 = very much like me

- | |
|---|
| 1. If I ruled the world it would be a better place. |
| 2. I can usually talk my way out of anything. |

Section 13: Personal Thoughts and Behaviors

Using the scale below as a guide, write in a number from 1 to 5 to indicate how much you agree with each of the following statements.

1	2	3	4	5
Disagree Strongly	Disagree	Neutral	Agree	Agree Strongly

- ___1) **Not** hurting others' feelings is important to me.
- ___2) I think I could "beat" a lie detector.
- ___3) I'm a rebellious person.

2.2.2 Specification Using New Standard

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Section 12: Self Beliefs (SB)

=====

SBIntro

The following is a list of statements that you may or may not identify with. Read each statement carefully. Then, using the scale shown, please rate the extent to which each statement describes you.

/"Self Beliefs Intro"

◆ Press [ENTER] to continue

=====

SB1

If I ruled the world it would be a better place.

/"World better place"

Not at all	1
A little	2
Somewhat	3
Quite a bit	4
Very much	5

=====

SB2

I can usually talk my way out of anything.

/"Smooth talker"

Not at all	1
A little	2
Somewhat	3

Quite a bit 4
Very much 5

=====

=====
Section 13: Personal Thoughts and Behaviors (PTB)
 =====

PTB1

Using the scale listed as a guide, select the number from 1 to 5 to indicate how much you agree with each of the following statements.

Not hurting others' feelings is important to me.

/"Not hurt others' feelings"

Disagree strongly	1	
Disagree		2
Neutral	3	
Agree	4	
Agree strongly	5	

=====
PTB2

I think I could "beat" a lie detector.

/"Beat lie detector"

Disagree strongly	1	
Disagree		2
Neutral	3	
Agree	4	
Agree strongly	5	

=====
PTB3

I'm a rebellious person.

/"Rebellious person"

Disagree strongly	1	
Disagree		2
Neutral	3	
Agree	4	
Agree strongly	5	

2.2.3 Second Example of Specifications Based on the New Standard

This is the best example of a specification that was created in 2008 using the SRC Blaise Standards as a guideline. It reflects in a standardized fashion questionnaire content, screen design, programming, and analysis and documentation requirements. The programmer is given the Blaise field name, field tag, question text, interviewer instructions in the appropriate font and color, response options, skip instructions, data type information, and a field description.

HSC1_SC20

HSC1_SC20_NCS

The next questions are going to require you to think back over your entire life. Please take your time and think carefully before answering.

♦ **Read the following questions slowly**

Have you ever in your life had an attack of fear or panic when all of a sudden you felt very frightened, anxious, or uneasy?

/ “Had Fear or Panic Attack”

Yes..... 1 (GO TO HSC3_SC20_1)
No 5
DK
RF

Question Type: Enumerated; Range 1 and 5

HSC2_SC20a

HSC2_SC20a_NCS

Have you ever had an attack when all of a sudden

- you became very uncomfortable,
- you either became short of breath, dizzy, nauseous, or
- your heart pounded,
- or you thought that you might lose control, die, or go crazy?

/ “Had Other Attack”

Yes..... 1
No 5
DK
RF

Question Type: Enumerated; Range 1 and 5

HSC3_SC20_1

HSC3_SC20_1_NCS

Have you ever in your life had attacks of anger when all of a sudden you lost control and broke or smashed something worth more than a few dollars?

/ “Attack Broken Things”

Yes..... 1
No 5
DK
RF

Question Type: Enumerated; Range 1 and 5

HSC4_SC20_2

HSC4_SC20_2_NCS

Have you ever had attacks of anger when all of a sudden you lost control and hit or tried to hurt someone?

/ “Attack Hurt Someone”

Yes..... 1 (GO TO HSC6_SC21)
No 5
DK
RF

Question Type: Enumerated; Range 1 and 5

3. SRC Blaise Standards

The benefits of implementing the SRC Blaise Standards include a significant increase in instrument quality and a reduction in development time. By standardizing the specifications for Blaise survey instruments, we have also created an important and powerful communication tool for the survey manager, the specification writer, the client or researcher, the CAI programmer, and the testing team to use during the application development and testing phase.

Some of the basic requirements of the standardized specification include:

- Field Name, Field Tag, Field Description
- Question Text
- Interviewer Text
- Response Categories
- Routing/Skip Instructions
- Data Types

Other important elements of a Blaise specification are:

- Fill Logic
- Edit Masks
- Soft Consistency Checks (Signal)
- Hard Consistency Checks (Check)
- Explicit Checkpoints
- Logic for Constructed Variables or Re-Coding

3.1 General Specification Rules

Some general rules were developed for users to follow when specifying a question for a Blaise survey application:

Specifying A Blaise Question (SRC 2008)

For each question in a Blaise instrument, generally the following are specified;

1. Field Name (variable name), generally alpha-numeric (e.g. A1, B2, etc.). Note:
 - Avoid the use of underscores if possible, since field names are used in the Blaise program code and underscores increase programming time;
 - However, “ENTER all that apply” field names require underscores at the end (e.g., B1_);
 - Avoid the use of letters and numbers in positions where they may be confusing (such as the lowercase letter “l” and the number “1,” letter “O” and number zero “0,” the number “2” and the letter “Z,”; and

- Due to variable naming constraints with some data processing software, **Field Names should not exceed 16 characters**
- 2. Field Description, a brief meaningful descriptive text (e.g., Current 2. Grade), **not to exceed 25 characters in length**; this is what is displayed next to the entry window on the Blaise screen.
- 3. Question text
- 4. Response option categories (if an enumerated question)
- 5. Skip (go to) instructions
- 6. Data type (if not an enumerated question)

Note that a Blaise Field Tag will always be programmed; if not specified, it will be the same as the Field Name. As with Field Names, Field Tags have no spaces. Some surveys may need an additional variable descriptor or ID, and could use the Field Tag for this purpose.

MQDS can display the Field Name, Field Description, or Field Tag as the variable name or ID, thus providing flexibility in generating documentation for a variety of purposes.

Particular questions may have additional specifications:

- | | |
|---|---|
| 1. Online help indicator | 7. Explicit programmed checkpoint |
| 2. Interviewer instructions, including probes | 8. Routing instruction logic |
| 3. Optional text and variable text | 9. Logic for constructed or recoded variables |
| 4. Field-specific attributes (e.g., DK, RF, or EMPTY) | 10. Soft consistency check (Blaise SIGNAL) |
| 5. Edit mask | 11. Hard consistency check (Blaise CHECK) |
| 6. Logic for fills (variable text) | |

3.2 Sample Specification from SRC Blaise Standards

NOTE: Standard screen design icons and instruction bullets and colors are not required in the specifications

Field Name	{Alphanumeric, e.g., B1; no spaces}
Field Tag	{= Field Name if not specified; no spaces}
n of n	{e.g., 1 of 2; for multi-part questions, such as time-unit and period}

[F1] - Help

RB Page #
 Calendar
 Interviewer Checkpoint
 Question text ^fill (optional text)?
 Interviewer instruction(s)
 ENTER all that apply [if applicable]
 /"Field Description" {Meaningful description with spaces}

Name1	Response option1 label	1	GO TO NextQ
Name2	Response option2 label	2	GO TO NextQ
Name3	Response option3 label	3	GO TO NextQ
Name4	Response option4 label	4	GO TO NextQ
Name5	Response option5 label	5	GO TO NextQ
Other	Other – Specify	7	
DK			GO TO NextQ
RF			GO TO NextQ

[Enumerated, (implicit); requires response options and relevant skips, as above]

Integer; range n-n; edit mask

Numeric; n decimal places, range n.nn-nn.nn; edit mask

Currency; n decimal places, range n.nn-nn.nn; edit mask

String; width= n; Edit Mask

Open End

Attributes: [DK, RF, EMPTY, NODK, NORF]

Routing instruction logic

Constructed variable or recode logic

Fill logic

Condition, "Fill text"

Condition, "Fill text"

Soft consistency check:

Condition

"Probe text"

Signal number; e.g. "Signal Fieldname"

Hard consistency check:

Condition,

"Probe text"

Check Number; e.g. "Check Fieldname"

Programmer Notes

Adding a visible break between questions helps programmers to clearly see what specifications are associated with particular questions

3.3 Quick Reference Guide

As part of the SRC Blaise Standards, a "Quick Reference Guide" was created. Based on a concept demonstrated to us by Mathematica Policy Research, Inc., we developed a "Quick Reference Guide" that would provide the user with an at-a-glance view of a variety of common question types used in SRC Blaise survey instruments.

For each question type, we used a four-panel style to show the user the following:

- How the question is specified;
- How the question is programmed in Blaise;
- How the question appears in the Blaise Data Entry Program (DEP); and
- How the question appears in the Michigan Questionnaire Documentation System (MQDS) output.

3.3.1 Sample of Quick Reference Guide – Enumerated Question Specified

Yes/No with Skip Logic

B1
Do you currently use a computer, either at work, at home, or at school?

/ "Currently Use a Computer"

Yes	1	
No	5	GOTO B3
DK		GOTO B3
RF		GOTO B3

B2
Have you used the Internet

/ "Used the Internet"

Yes	1	GOTO B4
No	5	GOTO B4
DK		GOTO B4
RF		GOTO B4

Specification

3.3.2 Sample of Quick Reference Guide – Enumerated Question Programmed

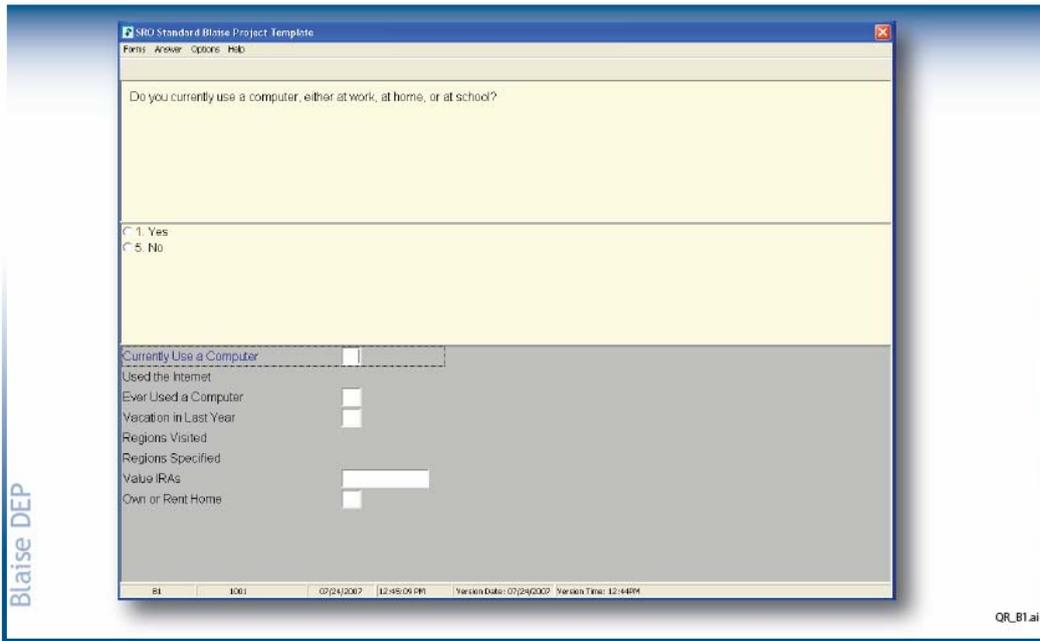
B1 (B1)
 "Do you currently use a computer, either at work, at home, or at school?" /
 "Currently Use a Computer" :

TYesNo

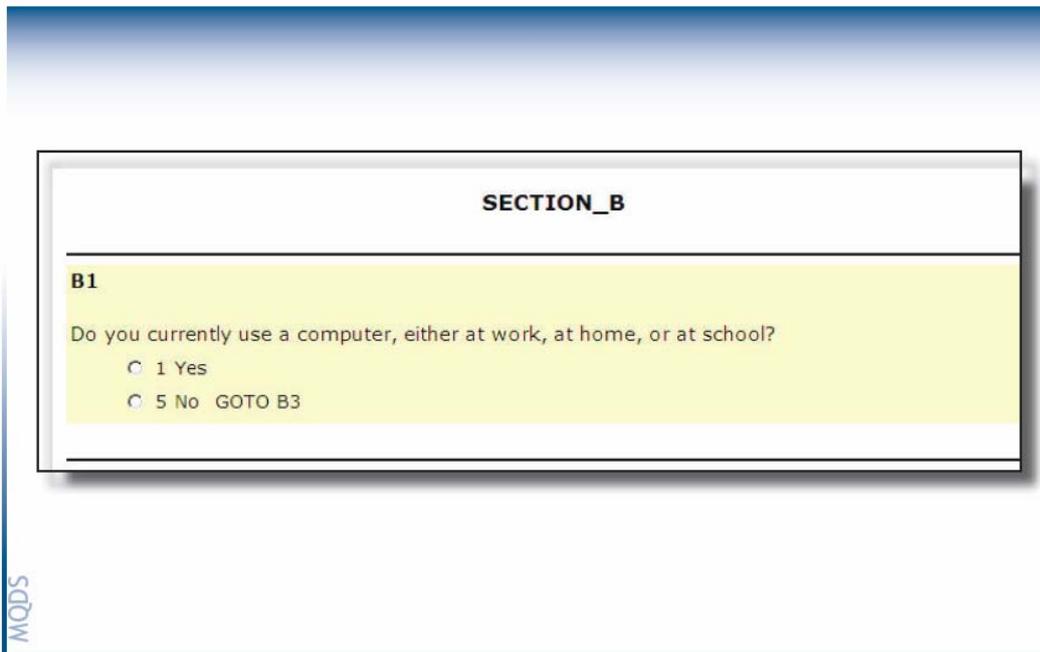
TYesNo :
(Yes (1),
No (5))

Programming

3.3.3 Sample of Quick Reference Guide – Enumerated Question in Blaise DEP



3.3.4 Sample of Quick Reference Guide – Enumerated Question in MQDS



4. Future Impact of SRC Blaise Standards

We believe there is sufficient anecdotal evidence that there is a significant positive impact on Blaise application development due to the introduction of the SRC Blaise Standards publication.

A future idea is to develop a proposal seeking funding to design and carry out an experiment to measure the impact of the SRC Blaise Standards on:

- Development time
- Development cost
- Application quality

We believe the SRC Blaise Standards in conjunction with the SRC CAI Testing Tool (CTT) (Dascola, Pattullo, and Smith 2007) has improved the overall quality and robustness of our Blaise survey instruments.

5. References

Couper, Mick P. 2000. *Development and evaluation of screen design standards for Blaise for Windows*. Paper presented at the 6th International Blaise Users Conference, Kinsale, Ireland, May.

Survey Research Center. 2008. *SRC Blaise Standards*. Ann Arbor: The University of Michigan.

Dascola, M., Pattullo, G., and Smith J. 2007. *CTT: CAI Testing Tool*. Paper presented at the 11th International Blaise Users Conference, Annapolis, Maryland, USA, September.