

Questionnaire Structure Diagrams

Questionnaire structure diagrams are useful in questionnaire design, data file design, editing specification development, tabulation plan development, and data analysis.

Census and survey questionnaires are characterized by their *content*, *format*, and *structure*. **Content** is the information to be obtained. It is defined by the questions included and the possible answers to each question.

Format refers to physical and graphic design characteristics—the size and weight of paper, layout, colors, and so forth. Content and format are by definition orthogonal. Content may be formatted in many different ways.

Structure refers to which questions are asked of which persons (households, other entities). It is defined by "skip" instructions.

Skip instructions may reflect logical necessity. "Age at first marriage" is undefined for never married persons. A skip instruction will ensure that the question is asked only of ever married persons.

They may also reflect practicality. "Country of birth" is defined for all persons, but most people enumerated in most countries will have been born in that country. Why oblige enumerators to record identical information for almost everybody? A skip instruction can ensure that country of birth is asked only of persons born outside the country of enumeration.

Questionnaire structure diagrams involve three key ideas: *sequence*, *contingency*, and *call-outs*. **Sequence** is the order in which questions are asked, represented diagrammatically in Figure 1.

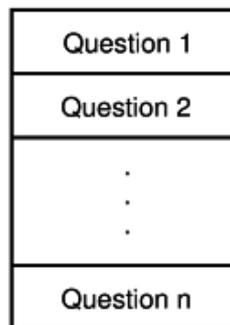


Figure 1: Sequence

The questionnaire as a whole is represented by the outer rectangle. Individual questions are shown in the component rectangles ("boxes", "blocks"). Component rectangles may also contain groups of questions.

"Enter the first box," the diagram says, "carry out the instructions contained in it, move through the lower boundary to the box beneath, carry out the instructions in this box, and so on."

Areas in the diagram between any two horizontal lines represent questions or groups of consecutive questions.

Contingency is what gives questionnaires structure. The next question asked is contingent on answers to previous questions.

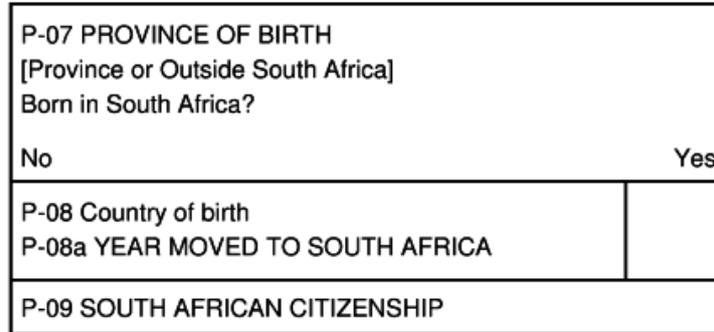


Figure 2: Contingency

If the answer to “Born in South Africa?” in Figure 2 is “No”, the enumerator moves to the box below on the left, beneath the “No”, asks the country of birth and year moved to South Africa questions, and then moves down to the box containing the citizenship question.

If the answer is “Yes”, the enumerator moves to the box below on the right, beneath the “Yes”. This is an empty, “do nothing”, box. The enumerator passes through it to the box beneath.

Areas between two vertical lines represent groups of persons of whom particular questions are asked. The area to the left of the vertical line in the second rectangle in Figure 2 represents persons born outside the country. The area to the right of this line represents persons born in the country.

Figures 1 and 2 illustrate principles. Figure 3 shows a practically useful example, the employment section of the main questionnaire of the 2011 census of South Africa (see the RESOURCES section below).

Which persons are asked question P27, “Reason didn’t work”? The diagram makes the answer easy to see: Persons who did not work in the 7 days preceding the census (No to P23), were not temporarily absent from regular work (No to P24), were not looking for work (No to P25), and who would like to have worked (Yes to P26).

The diagram shows at a glance that two groups of persons are asked the industry, occupation and sector questions—because the box containing P29ab may be entered from two different boxes above it. The vertical section to the left represents persons who worked during the last 7 days (Yes to P23). The vertical section to the right represents persons who did not work (No to P23) but were temporarily absent (Yes to P24).

Sometimes diagrams bring attention to points that might otherwise be missed. Figure 3 shows that persons who looked for work (“Yes” to P25) were asked whether they would have been available to work (P28).

If they were not available for work, why would they have been looking for it?

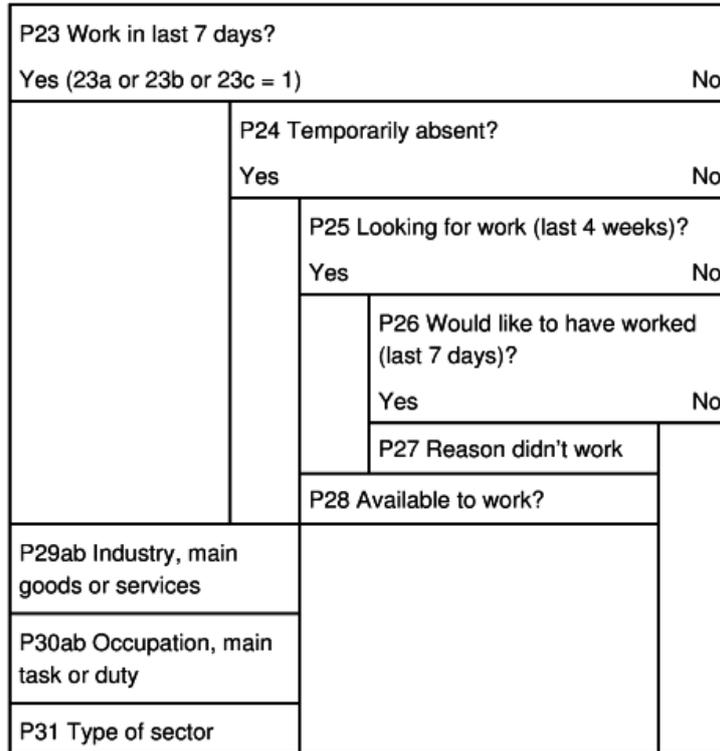


Figure 3: Economic Activity Questions

Perhaps looking was required to realize benefits of some kind? Or is the anomaly resolved by the different reference periods, 4 weeks for “Looking for work” versus 7 days for “Liked to work”?

The abbreviated text in Figure 3 makes the diagrams more compact and does not detract from their value as examples in this presentation. In practice, diagrams may include something closer to the full text of the questionnaire.

Callouts are references to separate diagrams showing the questions in a component rectangle of a diagram. Callouts make it possible to display overall questionnaire structure of any questionnaire on a single page.

Figure 4 diagrams a supplemental questionnaire used in the June 1980 Current Population Survey of the United States. Four of the boxes contain callouts, one for marriage history questions, two for birth history and birth expectations questions, and one for children of previous marriages questions.

The complete questionnaire is represented by five diagrams, the summary diagram and the four callout diagrams. Each callout diagram has a header matching the callout in the summary diagram.

The June 1980 CPS Supplemental Questionnaire is exceptionally complex. 19 of the 31 questions contain skip instructions, some to as many as four different places in the questionnaire. The development of questionnaire structure diagrams was motivated my effort to understand this questionnaire.

Questionnaire structure diagrams are a form of computer flow diagrams known as “Chapin Charts” (see RESOURCES section below). A questionnaire is a “program” that directs the work of enumerators.

28A Marital status			
Ever married		Never married	
29-43 Marriage history		28B Female 18+?	
		Yes	No
44 Sex			
Male		Female	
44a Male, currently married in 2nd or later marriage or currently widowed, separated or divorced			
No		Yes	
45-46 Children of previous marriages		47-52 Birth history	
		53-55 Birth expectations	

Figure 4: Supplemental Questionnaire for the June 1980 US CPS

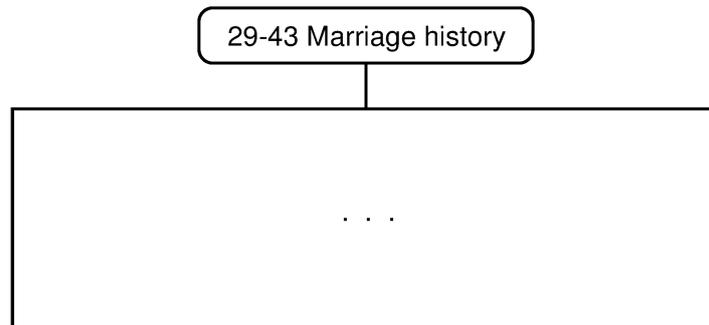


Figure 5: Callout diagram with header

0.1 Resources

Census 2011 results and documentation, including the full set of census questionnaires, are available on the Statistics South Africa website, www.statssa.gov.za.

Census questionnaires for most countries are available on the [United Nations Statistics Division](http://unstats.un.org/unsd/demographic/sources/census/censusquest.htm) web site. The link at this writing is

unstats.un.org/unsd/demographic/sources/census/censusquest.htm.

Questionnaires may be preliminary versions not used in the census.

On Chapin Charts see Ned Chapin, “A new format for flowcharts”, *SOFTWARE—PRACTICE AND EXPERIENCE*, Vol. 4, pages 341-357, 1974.

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