

# An Experiment with Skip Instructions

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Several authors have noted the problem of skip-pattern compliance in self-completion surveys, and suggested possible solutions. A mail survey on the effect of debt and work on University students' performance was used to test four different methods of presenting skip instructions for the same six questions. The survey had an effective response rate of 59% (from an initial sample of 2300), giving subsamples of approximately 300 for each version of the questionnaire. The four methods tested were the common default pattern, full skip instructions, a prevention skip instruction, and no skip instructions. The proportion of errors of omission and errors of commission were compared for each method. Having no skip instructions produced the lowest overall error rate (0.7%), compared to 3.1% with skip-prevention instructions, 4.9% with the common default pattern, and 5.9% with full skip instructions. These results suggest that researchers should consider not only the presentation of skip instructions in self-completion questionnaires, but also whether skip instructions are necessary or desirable.

Keywords: questionnaire design, skip instructions, survey, self completion

## Introduction

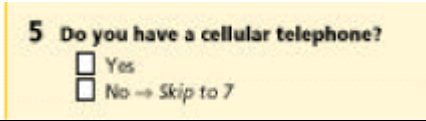
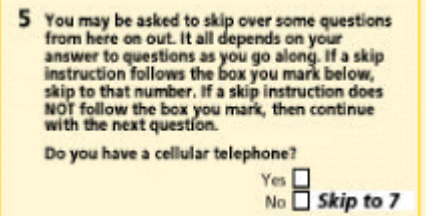
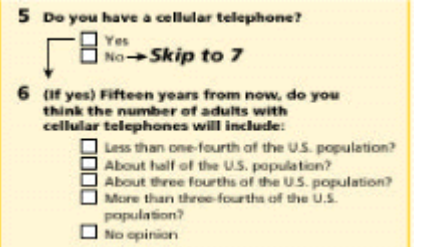
There are two types of errors that respondents can (and do) make when they encounter a skip instruction in a self-administered questionnaire. An error of commission (or loop error) occurs when a respondent is instructed to skip past the next question, but instead answers it. An error of omission (or gap error) occurs when a respondent is supposed to answer the next question, but instead skips it.

Of the two, errors of commission appear to be more prevalent, but also more amenable to control. Table 1 shows the results of a study of skip-pattern compliance by Redline, Dillman, Smiley, Carley-Baxter and Jackson (1999), which used the standard US Census Bureau method as the control and compared this with a Prevention Method and a Detection Method. The study was a 'classroom' study involving a convenience sample of university students.

Redline and her colleagues found that errors of **commission** were significantly reduced by the Prevention Method and, even more so, by the Detection Method, while errors of **omission** using these methods were twice as high as for the standard Census Bureau method.

This result is rather inconvenient because errors of omission are much more serious than errors of commission. If respondents answer questions they are not supposed to, this can be dealt with during data cleaning, but if they miss questions they should answer, their data are incomplete. Fortunately, the average error of omission rate is much lower than the average error of commission rate and, in absolute terms, is low. However, for some individual questions in the study reported the omission error rate was more than 10%.

**Table 1. Skip-pattern compliance: Redline et al (1999)**

Skip Method	Mean Percentage Error Rate	
	Errors of Commission %	Errors of Omission %
<i>US Census Bureau Method</i>		
 <p><b>5</b> Do you have a cellular telephone?  <input type="checkbox"/> Yes  <input type="checkbox"/> No → Skip to 7</p>	20.3	1.6
<i>Prevention Method</i>		
 <p><b>5</b> You may be asked to skip over some questions from here on out. It all depends on your answer to questions as you go along. If a skip instruction follows the box you mark below, skip to that number. If a skip instruction does NOT follow the box you mark, then continue with the next question.  Do you have a cellular telephone?  Yes <input type="checkbox"/>  No <input type="checkbox"/> Skip to 7</p>	9.0	3.3
<i>Detection Method</i>		
 <p><b>5</b> Do you have a cellular telephone?  <input type="checkbox"/> Yes  <input type="checkbox"/> No → Skip to 7</p> <p><b>6</b> (if yes) Fifteen years from now, do you think the number of adults with cellular telephones will include:  <input type="checkbox"/> Less than one-fourth of the U.S. population?  <input type="checkbox"/> About half of the U.S. population?  <input type="checkbox"/> About three fourths of the U.S. population?  <input type="checkbox"/> More than three-fourths of the U.S. population?  <input type="checkbox"/> No opinion</p>	7.6	3.7

Source: Redline et al (1999)

In Redline et al's study the average error of omission for the test methods is inflated by high error rates for a few individual questions and, for some questions, the test methods perform better than the control. Nevertheless, overall the methods designed to reduce omission errors actually increased them.

A different approach to reducing skip errors is to do away with skip instructions altogether. In theory, this approach should eliminate errors of commission (because respondents are expected to answer all questions) and, because there are no skip instructions for respondents to notice, read, understand or act on, it may also be more successful in reducing errors of omission.

This paper reports the results of a study that compared three methods of presenting skip instructions in a self-completion questionnaire, with a questionnaire containing no skip instructions.

## Method

In their simplest form, the four skip pattern methods tested were as follows:

### *The common default pattern*

23. Do you have a full-time paid job?

Yes  1  
No  2 GO TO Q28

This is similar to the standard US Census Bureau method of providing skip instructions, except that the answer boxes are on the right of the response options and the skip instruction is in capitals, rather than in upper and lower case like the response options.

### *Full skip instructions*

23. Do you have a full-time paid job?

Yes  1 CONTINUE TO Q24  
No  2 GO TO Q28

As already mentioned, the main problem with skip-pattern compliance is respondents not continuing to the next question when they are supposed to (i.e., committing an omission or gap error). Including explicit instructions for every response option is an attempt to overcome this problem. Conceptually this has some similarities with Redline et al's Detection Method, though it does not include the important 'detection' component at the start of the next question. However, it is much simpler graphically.

### *Prevention skip instruction*

**ATTENTION: CHECK FOR A 'GO TO' INSTRUCTION IN THE NEXT QUESTION**

23. Do you have a full-time paid job?

Yes  1  
No  2 GO TO Q28

Before each question containing a skip instruction, the instruction: "ATTENTION: CHECK FOR A 'GO TO' INSTRUCTION IN THE NEXT QUESTION" was included. The assumption is that this will make respondents more attentive to the skip instruction in the subsequent question. This was the most successful alternative method for reducing errors of omission in Redline et al's study. However, unlike Redline et al's Prevention Method, in this study there was no comprehensive explanation of the skip instruction phenomenon given before the first question containing a skip instruction

***No skip instruction***

23. Do you have a full-time paid job?

Yes  1

No  2

24. How many hours a week do you usually work in your full-time paid job?

**Write in hours per week:** \_\_\_\_\_ or N/A  0

This method required minor modification to some subsequent questions to allow for 'not applicable' responses from respondents who would normally be skipped past these questions. In the example shown, respondents who answered "No" to Question 23 would be expected to tick "N/A" in Question 24.

**Procedure**

The vehicle for this research was a mail survey of 2284 students from Massey University in New Zealand, conducted between November and December 1999. After two reminders, 1296 valid responses were received; 56 questionnaires were returned 'Gone-no-address', 17 potential respondents were ineligible (were not students), and 23 students refused to take part in the survey. This represents an effective response rate of  $1296/(2284-56-17) = 59\%$ .

Because Massey University has a large distance education programme, half of its students are part-time and they are representative of a wide spectrum of New Zealand society (though presumably the better educated end of this spectrum). Most students in the achieved sample were women (65%), and the age range was from 18 to 71.

The survey questionnaire was concerned with effects of work and debt on students, and comprised five sections: background information (mainly demographics), current study plans; financial situation; work and debt. Four versions of the questionnaire were produced, with the same six questions in each modified as required to implement one of the four skip instruction treatments. Respondents were randomly allocated one of the four different questionnaire versions; this gave achieved sample sizes of between 264 and 312 for each version.

**Results and Discussion**

Compliance with skip instructions was evaluated by calculating the mean percent of commission and omission errors for each skip instruction treatment. The results are shown in Table 2.

**Table 2. Mean percent commission and omission errors by treatment**

<b>Error Type</b>	<b>Common Default Pattern (n=1848)</b>	<b>Full Skip Instructions (n=1950)</b>	<b>Prevention Skip Instruction (n=1962)</b>	<b>No Skip Instruction (n=1980)</b>
Commission Error (%)	4.2	5.7	2.3	0.6
Omission Error (%)	0.7	0.2	0.8	0.1
Total Error (%)	4.9	5.9	3.1	0.7

Note: Sample sizes are numbers of individual questions analysed.

The general pattern of these results is consistent with that observed by Redline and her colleagues. Errors of commission are more common than errors of omission, and the Prevention Skip Instruction method produces fewer commission errors than the Common Default Pattern, but not fewer errors of omission. However, the most striking feature of the results from this study is the success of the No Skip Instructions Method, which produced the lowest mean percent commission, omission and (of course) total errors.

In fact, the superiority of the No Skip Instructions Method is arguably understated by the results shown in Table 1. Theoretically, with no skip instructions there cannot be any errors of commission. However, we counted as errors cases where respondents gave responses to a subsequent question that would have been defined as commission errors for the common default pattern. For example, if the response to the question, "How much influence, if any, did the cost of going to university have on your decision to study at Massey or on the course of study you chose?" was "None at all", it was assumed that the answer to the next question, "What effect did this have?" should be "None of these" (from a list of possible response options). If the answer was any of the other responses, this was counted as an error of commission. This is a harsh criterion because some of the responses to the subsequent question were not necessarily incompatible with the answer "None at all" to the skip question (for example, "Chose to live at home").

Full skip instructions increased errors of commission compared to the Common Default Pattern and were much less successful in reducing these than the Prevention Method. However, they were effective in reducing errors of omission. Nevertheless, for anything other than simple, two-option questions they take up a lot of white space and increase the visual complexity of the questionnaire, as the following example illustrates.

12. How much influence did the cost of going to university have on your decision to study at Massey or on the course of study you chose?

None at all	<input type="checkbox"/>	1	GO TO Q14
Not much influence	<input type="checkbox"/>	2	CONTINUE TO Q13
A fair amount of influence	<input type="checkbox"/>	3	CONTINUE TO Q13
A great deal of influence.	<input type="checkbox"/>	4	CONTINUE TO Q13

Consequently, full skip instructions are not an attractive option. Furthermore, though there is no evidence in the study for this, we suspect that some respondents do not read the skip instructions; they simply assume that they are supposed to continue to the next question. This would explain the higher incidence of commission errors and the low incidence of omission errors with this method.

The error rates calculated in this study are considerably lower than those reported by Redline et al. This may have something to do with differences in the samples of students involved (though it is hard to imagine why New Zealand students would be less error prone than their American counterparts), or in the way in which the surveys were administered, but is most likely to be explained by differences in the complexity of the questionnaires, indicated by the number of skips involved.

In the questionnaire used in this study there were six questions involving skips out of a total of 41 questions. In Redline et al's study, the questionnaire contained 24 skip questions out of a total of 50 questions, and the questionnaire was specifically designed as a stringent test of skip instructions. Thus questionnaire 'complexity' is the logical explanation for differences in the scale of errors observed in the New Zealand and US studies.

As was the case in the Redline et al study, mean error rates varied for the individual questions examined in this study. However, two questions out of the six tested produced most of the commission and omission errors. These questions are shown and discussed below.

The first question was:

Q14. Do you expect to complete the course of study you are currently enrolled in at the end of this year?

- Yes  1
- No  2 GO TO Q16
- Not sure  3

This is a relatively simple question with a straightforward skip, yet it produced the error rates shown in Table 3.

**Table 3. Error rates: Question 14**

<b>Error Type</b>	<b>Common Default Pattern</b>	<b>Full Skip Instructions</b>	<b>Prevention Skip Instruction</b>	<b>No Skip Instruction</b>
Commission Error (%)	15.4	16.0	5.9	0.6
Omission Error (%)	2.3	0.9	6.7	0.0

However, this question came at the bottom of a page, and Dillman, Carley-Baxter & Jackson (1999) suggest that skips from the last question to be answered at the bottom of a page (or column) produce high error rates<sup>1</sup>.

The second question was:

Q15. Do you intend studying further next year?

- Yes  1 GO TO Q19  
 No  2  
 Not sure  3 GO TO Q19

The error rates for this question are shown in Table 4

**Table 4. Error rates: Question 15**

Error Type	Common Default Pattern	Full Skip Instructions	Prevention Skip Instruction	No Skip Instruction
Commission Error (%)	32.9	35.0	28.1	0.3
Omission Error (%)	5.9	0.0	3.9	0.0

In Dillman et al's study, questions with answer categories that alternated between skip and continuation also had higher error rates. This is one possible explanation for the high error rates observed for this question. However, another plausible reason, particularly for the high rate commission errors observed in this case, is that the next question may have seemed a logical one to answer for many respondents who were supposed to skip it.

This subsequent question asked, "Do you intend continuing the course of study you are currently enrolled in?" For respondents who had answered "Yes" or "Not sure" to the previous question ("Do you intend studying further next year?"), this may have seemed a logical question to answer, despite a skip instruction to the contrary. Thus, the content of a subsequent question as well as the characteristics of questions with skip instructions may determine how prone particular questions are to skip-compliance errors.

## Conclusions

Though it may not always be explicitly stated, questionnaire designers generally accept that respondents should not be asked questions that do not apply to them. Rather, it is assumed that a 'good' questionnaire will incorporate an elegant branching structure, through which respondents will be guided by a series of skip instructions. Thus the emphasis of research in this area has been on developing methods of presenting skip instructions that minimise non-

<sup>1</sup> Dillman et al analysed the same data as Redline et al but used a different method for calculating error rates. The method subsequently used by Redline et al is acknowledged to be the correct one.

compliance errors. The research discussed in this paper suggests that this emphasis may be misplaced.

While efforts to reduce commission errors have been successful, these are the least important type of non-compliance error, and, ironically, the methods that are best at reducing commission errors actually appear to increase the more important errors of omission. Furthermore, the research reported here shows that the best way to reduce skip-compliance errors is to avoid skip instructions altogether. The logical implication of this is that when designing questionnaires researchers should avoid branching wherever possible.

This is not a new idea. In their 1982 paper, Messmer & Seymour concluded:

*The implications of these results for survey researchers seem clear. Branching instructions increase the complexity of the instrument, leading to higher nonresponse rates for those questions immediately following a branch. Hence, the use of branching instructions should be minimized where possible.*

Dillman et al consider the possibility of eschewing skip instructions entirely but conclude that it would be undesirable to allow or encourage people to answer every question, regardless of whether it applies to them. They believe that doing so will create frustration on the part of respondents, leading to lower unit response rates. If this were the case, it would be a strong argument in favour of branching, but in this study the response rates for the three questionnaires with skip instructions were 56%, 59% and 60% respectively, and 60% for the questionnaire with no skip instructions. Thus there was no evidence that a questionnaire without skips produces a lower response rate than one with them.

Furthermore, we are not suggesting that it is sensible to require respondents to answer large blocks of questions that clearly do not apply to them, and neither did Messmer & Seymour. However, where branching involves skipping a small number of questions (perhaps up to three or four), there seems little to be lost and potentially something to be gained by designing a questionnaire to avoid branching.

Apart from the decrease in non-compliance errors, there are other possible benefits from this approach. First, questionnaires without skips have fewer questions and more white space. As a result they are shorter and look 'cleaner' than those with branching structures. This may not be terribly important but, other things being equal, a shorter, cleaner, questionnaire is desirable.

Second, occasionally a well-intentioned skip instruction results in a question that should be asked not being asked. As an example, in a survey on the performance of a local licensing trust, respondents were asked the question, "Are you satisfied with the Trust's performance?" Only those who answered "No" were asked the next question, "What could the Trust do better?" Those who answered "Yes" were skipped past it. Fortunately this was a face-to-face survey and fortunately the interviewers quickly realised that many respondents who answered "Yes" to the first question actually wanted to answer "Yes, but..." and then explain what the Trust should be doing better. After a few interviews the interviewers ignored the skip and asked all respondents both questions.



It could be argued that this was simply a case of poor questionnaire design. However, 20:20 hindsight is a wonderful thing, and we would be surprised if this were the only case in which a skip that seemed logical when a questionnaire was designed turned out to be a mistake. Not having skips avoids the possibility of this occurring.

There are, however, two important issues that need to be examined before the advice to avoid branching wherever possible could assume the status of a principle of questionnaire design. First, the question of whether questionnaires with no (or very few) skips produce lower response rates needs to be answered. Second, the question of data quality needs to be examined. We cannot simply assume that removing filter questions and rewriting other questions to accommodate this has no effect on data quality. While eliminating branching reduces the structural complexity of a questionnaire it may increase the complexity of individual questions, with potentially detrimental effects on respondent understanding or even willingness to read all of the response categories.

Finally, there is one other issue related to questionnaires with no branching that we have not discussed. This is the fact that any desirable routing pattern has to be imposed on the data either at the data cleaning stage or during analysis. This may or may not be a disadvantage. While it may make data analysis a little more complex, the researcher has the choice of which cases to analyse for each question, and there is no reason why data cleaning should be more onerous (in fact, it may even be less time consuming because there will be fewer errors to examine).

## References

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