

M.B. Youngman

University of Nottingham

REDIGUIDE 12 : Guides in Educational Research

ISBN 0 94 60 69 00 X

February 1978

Copyright (1987) M.B.Youngman

Reprinted June 1980

March 1982

October 1987

CONTENTS

	Page
1 The importance of planning	3
2 Question specification	3
2.1 Source of questions	3
2.2 Fact or opinion	4
2.3 Structured or open	5
2.4 Question Structure	6
2.5 Difficulty	10
2.6 Impertinence	15
2.7 Suggestion	15
3 Questionnaire Design	15
3.1 Theme	18
3.2 Appearance	18
3.3 Size	20
3.4 Mixture	20
3.5 Order	20
3.6 Instructions	21
3.7 Automation	22
3.8 Thank you	23
4 Piloting	23
5 Distribution and Return	24
5.1 Method	24
5.2 Contents	25
5.3 Returns	26
5.4 Follow-up	26
5.5 Response rates	26
5.6 Non-response	27
5.7 Anonymity	27
6 Coding and Recoding	27
7 Tabulating the responses	28
8 Cross-tabulation	29
9 Refining the Analysis	30
10 Further Analysis of Questionnaires	31
References	32
Index	33

1. The Importance of Planning

The relative effort associated with different stages of research depends very much on the type of research being undertaken. Experimental approaches necessarily demand very careful selection of design, samples and measures, but the subsequent analysis then tends to be almost automatic. When research uses questionnaires, the balance of effort is often assumed to be reversed. Certainly to compile and distribute a large number of questionnaires may seem, and indeed sometimes be, a straightforward clerical exercise requiring very little research skill. Unfortunately, this simplicity is too often exaggerated, to the extent of assuming that analytical considerations are irrelevant at the initial stage. Such an approach will almost inevitably result in the introduction of difficult, and even insurmountable, problems during analysis. The solution lies in accepting that the initial and concluding stages of a survey are not independent; the questionnaire structure must include all the facilities deemed to be necessary for a successful analysis. For example, the treatment of various types of non-response (questions refused, pages missed, or even whole questionnaires not returned) should be considered from both the coding and analysis standpoints. Similarly, the role of open-ended questions should be decided in advance; failure to do so may result in the loss of essential factual information. Probably the simplest safeguard is to plan the questionnaire coding, before distribution, to take into account as many of the analyses as can be anticipated. Inevitably some will depend upon the outcome of preliminary tests, but the majority of analytical requirements can be accommodated with a reasonable amount of prior thought.

Before proceeding to the essential steps in questionnaire usage it should be mentioned that the researcher must satisfy himself that this method is likely to be more effective than other approaches such as interviews, observation or some combination of them. The remainder of this Rediguide assumes that the decision has been made in favour of questionnaires although many of the issues covered in Rediguide 11, Conducting and Analysing Interviews, could quite likely apply to questionnaires as well.

2. Question Specification

The variety of question structures, and the numerous problems associated with them, makes it vital to give careful consideration to all aspects of question specification. Failure to appreciate the degree to which the research outcome may hinge upon the strengths or weaknesses of individual questions could easily invalidate an entire study.

2.1 Source of Questions

Dreaming up interesting questions might seem an enjoyable and acceptable approach to determining questionnaire content, but for worthwhile results a much more rigorous procedure is necessary. As with any other attempt to isolate pertinent research data, the prime source must be the working hypotheses and the literature

survey that contributed these hypotheses. This implies two possibilities; either the literature study will have revealed specific questions, or more generally it will have suggested important areas needing more detailed investigation. Either way, there should be some theoretical justification for including a particular question, beyond superficial appeal.

2.2 Fact or Opinion

EXAMPLE 1

Do you have a Child at Higinthorpe Primary School?

YES	
NO	

Assuming that the respondent does not confuse the three terms Infant, Primary and Junior, and assuming also that "child" has been suitably defined to allow for step-children, foster children and so on, it should not be difficult to produce a reliable answer. But what about this:-

EXAMPLE 2

Does your child regularly do homework?

YES	
NO	

The interpretation of "regularly" is extremely arbitrary, and there is no indication regarding who supplies the homework. To turn this into a factual question both of these ambiguities must be removed. Even more doubtful is a question like this:-

EXAMPLE 3

Does your child expect to stay at school after 16?

YES	
NO	

The potential factuality of this question is very carefully disguised! At the other extreme, opinion or attitude questions are easily spotted:-

EXAMPLE 4

Do you consider your child's school to be co-operative?

YES	
NO	

From this example it should be clear that opinion is usually a matter of degree, making it unlikely that a simple YES/NO response will be satisfactory. One final warning about factual questions is that although in theory a question may be factual, in practice it may not be so. A good example concerns school size:-

EXAMPLE 5

How many children are in your school?

Given that school numbers fluctuate, at what time is the count to be made? More important, though, is the hint of precision in the question. Few teachers would know the answer to within 10 and the apparent need for an exact answer may be confusing. Since it is likely that broad size bands would be sufficient, the question should be phrased accordingly.

2.3 Structured or open

To some extent the deliberation over whether open or structured questions are required will already have occurred. In opting for a questionnaire rather than an interview approach, the assumption must be that the bulk of the information to be collected is accessible via structured questions. Consequently an open question like:-

EXAMPLE 6

What are the essential skills education should provide?

should tend to be used as an adjunct to the main theme of the questionnaire. For example it could allow the respondent to elaborate upon an earlier more specific question, such as:-

EXAMPLE 7

Is modern education suited to the needs of Britain today?

For all children?	
For most children?	
For many children?	
For few children?	
For no children?	

Another valuable use for the more open type of question is to put the respondent at ease. Excessive structure can progressively generate a feeling of repression or even resentment, simply because respondents feel they are not doing justice to their opinions. Open questions inserted at the end of major sections, or at the end of the questionnaire, can act as safety valves and possibly offer additional information. However, they should not be used to introduce a section since there is a high risk of influencing later responses.

The area where open questions are especially valuable is in pilot studies. Many researchers use a more extended approach at the pilot stage, on the understanding that subsequent refinement will allow a more convenient structure to be used in the main study.

2.4 Question Structure

Questionnaires can encompass a multitude of response formats although many of these are best treated as specific but separate methods. So a series of scaled attitude questions may be included in a questionnaire, but the analysis would need to bear in mind the principles implicit in scaling methods (see Rediguide 10). Nevertheless at the stage of questionnaire design it would be unnecessarily restrictive to assume that questionnaires only contain YES/NO questions, or indeed, only questions.

Statement or question: In question form Example 7 above seems rather awkward. Particularly where opinions are involved, it may be better to ask for an indication of degree of agreement with a statement.

EXAMPLE 8

Modern Education suits the needs of Britain today

For all children?	
For most children?	
For many children?	
For few children?	
For no children?	

Not only is the item less complicated, often it is shorter, making design and response that much easier.

Descriptions: The apparent simplicity of an item of the form:

EXAMPLE 9

Describe your school _____

belies the considerable difficulty of analysing the responses it generates. Even though analytical difficulty is not a sufficient reason for avoiding a technique, the value of purely descriptive items should be considered carefully beforehand.

Lists: After descriptions the next level of structure is listing.

EXAMPLE 10

List what you feel are the GOOD and BAD things about your school.

GOOD	BAD
_____	_____
_____	_____
_____	_____

However, similar problems remain, particularly those of classification, completeness (what can you deduce about something not mentioned?) and the varying lengths of the lists suggested. A simple solution to the last problem is to ask for a fixed number of comments.

Checklists: The first two problems in listing can partly be overcome by supplying the statements to be checked off (that is, answered YES). Because of the large number of items needed, possibly as many as 400, the subsequent classification may be a substantial undertaking. In the following example, the items are part of a 434-item engineering checklist and the classification was automatic, using a clustering procedure:

EXAMPLE 11

7 contact potential customers	☐
8 timetable operations within a project/programme.....	☐
9 preserve customer contact during personal absence	☐
10 assess whether existing component meets customer specifications.....	☐
11 choose materials appropriate to specifications	☐
12 receive enquiry regarding modification of component	☐

Categories: If certain important categories of response can be identified sufficiently early in a research design then it should be possible to improve the rather loose structure of the checklist by formulating more direct questions incorporating these broader response categories.

EXAMPLE 12

Which of these things do you
DISLIKE about your new school?

1.	BUILDINGS	
2.	TOO MANY CHILDREN	
3.	TOO MANY TEACHERS	
4.	THE NEW SUBJECTS	
5.	HOMEWORK	
6.	SPORT	

Since a relatively small number of categories (up to 20) is usually sufficient for most questions, some simplification is achieved compared with the earlier structures. Further benefits are achieved if the number of choices is fixed (for example, "indicate the WORST THREE things"). In many cases it will be legitimate to ask for a single choice, although this will normally only apply to factual questions.

EXAMPLE 13

What type of school do you attend?

1.	COMPREHENSIVE	
2.	GRAMMAR	
3.	SECONDARY MODERN	
4.	INDEPENDENT	
5.	OTHER*	

*If other please specify.

YES/NO questions: These are really no more than an alternative way of describing some of the methods already described. So in Example 12, when a specified number of choices is allowed, another way of obtaining the same information would be to treat the 6 categories as 6 separate YES/NO questions. This would certainly make most statistical analyses easier. The important benefit from the YES/NO formulation is that both possible responses, YES and NO are explicit. This is particularly valuable in scale construction because some of the problems of response bias (for example, people's stronger tendency to agree than to disagree) can be overcome by a judicious grading of positive and negative constructs.

EXAMPLE 14

1. Are the teachers helpful?
2. Is it easy to consult teachers?

	YES	NO	
	YES	NO	

A parent with reservations about school contacts would be more likely to disclose this via the second question than the first.

Partial Agreement: When the starkness of a YES/NO response becomes too restrictive, some gradation of response is necessary. The commonest rating system uses levels of agreement, usually with 5 response categories. It is the Likert scale.

EXAMPLE 15

Teachers are usually helpful

Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

Notice that the wording of the question needs to allow for the possibility of varying levels of agreement. If the statement had been presented in the form: "Teachers are always helpful", then responses would be forced towards the disagreement end purely through logic. A further consideration in choosing response categories concerns the "intermediate response". If it is included, it must be clearly differentiated from responses such as failure to understand the question, disagreement with the possibility rather than the tenor of the statement, or pure indecision. With a carefully piloted questionnaire it should be possible, and analytically preferable, to do without an intermediate response so long as it is made clear to the respondent how non-response is to be indicated.

Semantic differential: Here the level of agreement even further in that more gradations are offered, and the constructs themselves are finer and usually more personal. The respondent indicates the level of support for a construct defined in terms of opposites.

EXAMPLE 16

SCHOOL IS

difficult	1	2	3	4	5	6	7	easy
important	1	2	3	4	5	6	7	unimportant
long	1	2	3	4	5	6	7	short
useless	1	2	3	4	5	6	7	useful
interesting	1	2	3	4	5	6	7	boring

The more personal nature of such items makes the semantic differential a useful device for examining individual reactions over a broad range of personal involvements. As with the previous method, the instructions supplied to the respondent are an important part of the instrument. Anywhere from 5 to 12 categories have been used, but again a middle point may cause problems of interpretation.

Ratings: A slightly more conventional form of the semantic differential arises when a single, relatively commonplace construct is used to evaluate a range of situations:

EXAMPLE 17

Rate the IMPORTANCE of the following using 1 to indicate of little or no importance, 5 as very important.

Education	1	2	3	4	5
Intelligence	1	2	3	4	5
Specialised training	1	2	3	4	5
Qualifications	1	2	3	4	5
Personality	1	2	3	4	5
Luck	1	2	3	4	5

Instructions are again important, especially regarding the numerical link. As the rating method is largely arbitrary, a general rule in coding is to associate high numbers with positive constructs (that is, 5 = very important) since this produces a more natural interpretation at the analysis stage, particularly when correlations are involved.

Rankings: The final system to be considered here is where rank orders are applied to the items of interest. Right from the start it is vital that the difference between rating and ranking is appreciated. Certain other difficulties are associated with the method. Firstly it is not always easy to rank more than 4 or 5 items. And then the analysis of rankings may be restrictive if other information is to be related to the ranked items. The items of Example 17 could have been ranked rather than rated (6 categories would have been needed, of course) but in doing so some of the differences identified by ratings might have been obscured. Apart from straightforward approaches such as totalling first or last choices, the analysis of ranks can be complicated, requiring special procedures (see Siegel, 1956). However one relatively simple device is to allocate 1 point for the lowest rank, 2 for the next and so on. Adding these scores produces some indication of overall placement.

This summary of question structures is by no means exhaustive. The general benefit of such an outline is that many of the points relating to the methods covered apply equally well to other question forms.

2.5 Difficulty

When questions are formulated in such a manner that response becomes difficult, the reliability of the whole questionnaire can become suspect. For a start an intelligence dimension may be introduced unintentionally, and this could distort the responses of low-ability children. Difficulty also has the effect of alienating the respondent, often to the extent of producing flippant or even aggressive responses. Almost inevitably an ambiguous question will be unreliable through a tendency to generate random responses. One effective way of detecting potentially difficult questions is to pilot them by administering the questionnaire personally, timing each response. Any questions which take substantially longer to answer than others are quite likely too complicated. They should be reworded or broken down into separate parts.

Response overlap: This is a common error particularly with factual questions, but it is also easily remedied.

EXAMPLE 18

What is your age?

1	2	3	4
Under 20	21 - 25	25 - 30	Over 30

What answer does a 25 year old give? Category 3 should really be 26 - 30. There is, however, the opposite possibility, namely of leaving a gap. Categories 1 and 2 omit age 20. Probably category 2 should be 20 - 25, although it would depend on the data distributions.

Excessive precision: The danger of implying excessive precision has already been mentioned. Usually any numerical answer is best categorised within the question rather than at the analysis stage. Simply ensure that minimum precision is achieved.

Impossible questions: Even though certain questions may seem to request straightforward information, often it can be impossible to supply an answer, either because the wording is too precise or because the information is inaccessible. An example of an excessively precise question has already been offered in relation to school size, but any numerical answer is prone to this difficulty. Age, distance, salary or IQ are all cases where banding is a more appropriate structure. Inaccessibility occurs when the respondent does not have access to the information sought. Usually this involves attitudes, especially other people's rather than factual data.

Complexity: The following question, taken from a published questionnaire, is so complicated that its reliability could not be guaranteed.

EXAMPLE 19

IF YOUR SCHOOL(S) CHANGED ITS CHARACTER WHILST YOU WERE THERE PLEASE ANSWER QUESTION 10

2. What was the type of school?

	A	B
grammar	1	1
comprehensive	2	2
secondary-modern	3	3
*other	4	4

*please specify.....

10 Please describe any changes which took place in your school during your secondary education.

SCHOOL TYPE SEX OF PUPIL

A	From	To	From	To	More than 2 years before O-level	1
					2 or less years before O-level	2
					entry to A-level	3
					during A-level course	4
B					More than 2 years before O-level	1
					2 or less years before O-level	2
					entry to A-level	3
					during A-level	4

The solution is quite simple. Instead of asking a single question, take the respondent through the information in a series of sub-questions. As well as being more reliable it will also be easier to code and analyse.

10 Please indicate under school A any changes that took place.....
If you attended two secondary schools please supply details for the second, B, in brackets after the first.

SCHOOL A (B)

BEFORE CHANGE AFTER CHANGE

- (i) What type of school was it?
(ii) What sex were the pupils
1 = boys, 2 = girls, 3 = mixed

A	(B)	A	(B)
A	(B)	A	(B)

A (B)

- (iii) At what stage of your 1
education did the 2
change take place? 3
4

over 2 years before O-level		
2 or fewer years before O-level		
at entry to A-level course		
during the A-level course		

Double negatives: Most adults experience difficulty in handling double negatives and so there is little chance of children coping reliably with them.

EXAMPLE 20

- 22 Having a parent teacher association makes it more difficult to get all types of parents to help in school activities.....SA A Un SD D
- 29 The whole of your life is affected by your education.....SA A Un D SD
- 30 Teachers deserve great praise for the way they manage such large classes.....SA A Un D SD
- 32 Without a parent-teacher association you cannot talk things over as equals.....SA A Un D SD
- 34 Schools should use religious education to help children learn what is right and wrong.....SA A Un D SD

Question 32 of Example 20 is a fairly common double negative but it does require some care in answering. Occasionally people tackle a double negative by switching both negatives (ie with a PTA you) and then assuming that the same answer applies. Clearly that tactic would not necessarily be logically valid.

Double questions: Questions sometimes contain two separate propositions and then there is the problem of knowing to which the answer refers.

EXAMPLE 21

Education after 16 is too specialised SA A N D SD
and should only be compulsory for clever children.

This is rather obvious in its extremity but more subtle double-barrelled questions are common. Question 30 of Example 20 is not explicit in what is meant by "the way they manage large classes" - management can be good or bad. Question 34 is another one where there is a distinct danger of only part of the question being answered.

Excessive elaboration: The principle of parsimony is a very effective rule of thumb for question design. The longer a question is, the greater the chance of introducing some of the problems already discussed. Question 22 of Example 20 offers an instance of an unnecessarily elaborate question, gradually compounding difficulty. "Having a more difficult... all types of parents...to help in" are all grammatical and semantic formulations that are not immediately obvious by themselves, never mind in association. There is often a good case for sacrificing a degree of literary finesse if the meaning of the question can be made more accessible. For instance, with school children, colloquial expressions such as "get on " "OK", "sweets" and "bike" are likely to communicate more effectively than their more grammatical equivalents.

Consistency: Whilst it is reasonable, and indeed useful, to vary the structure of different sections of a questionnaire, there is a danger of confusing the respondent if variety is carried to extremes.

EXAMPLE 22

42 I find a lot of school work difficult to understand	Yes, often	Sometimes	Hardly ever
43 I should like to be one of the cleverest pupils in the class	Yes	Not sure	No
44 I work and try very hard in school	Always	Mostly	Sometimes
45 I am very good at sums	Always	Sometimes	Hardly ever
46 I don't get on well with some of the children in my class	Yes, true	Not sure	False

Within the space of 5 questions the child is expected to cope with 5 different response systems. Each requires extra thought and quite likely introduces an element of uncertainty in the child, for little real benefit. Better to forgo some of the specificity and instead to devise a more universal set of answer categories, such as YES/SOMETIMES/NO.

In addition to difficulty resulting from the form of individual questions, there is a further likelihood of confusing the respondent within the overall design of the questionnaire. Before dealing with that topic, there is the trap of impertinence.

2.6 Impertinence

Literally, impertinence refers to question content that is not pertinent to the main research theme. At the extreme, questions of this kind also become impertinent in the everyday sense because respondents may take personal offence and react accordingly. Recently, an example arose in a questionnaire emanating from a leading social researcher. Supposedly a survey of the job perceptions and expectations of university lecturers, a substantial proportion of later questions were devoted to political opinions and even affiliations. As a result a potentially valuable survey was jeopardised. The acid test to apply is whether you yourself would be eager to answer the questions, even if you were generally unsympathetic to research, as most people are.

There are two main points at issue here. The first, and most important, is that people have a right to keep their personal life to themselves. If you wish to investigate these features of individuals then you must expect to do so in a forthright manner, allowing respondents a straightforward choice as to whether or not they wish to participate. Slipping in the odd question here and there is not a legitimate ploy.

The second justification for keeping to an explicit theme is that the instrument itself becomes more reliable, and in turn almost certainly more valid. The respondent acclimatises to your intentions and is thereby able to marshal and express reactions more effectively. Where information such as marital status, age or even salary is required, and it is felt that there could be some reticence about supplying this, the reason for asking the question should be made clear. In some instances, it may be needed to check sample representativeness; another possibility is the need to examine specific sub-samples such as married women or emergency trained teachers.

2.7 Suggestion

The risk of suggesting suitable responses is not so strong in questionnaires as it is with interviews. Nevertheless, it is wise to be aware of the possibility of subconsciously implanting your own wishes in the question structure. Implicit answers are more likely to arise when the apparent range of response does not really exist. In Example 22, the wording of Question 45 effectively precludes the first response; no-one can **always** be **very good** at sums. Similarly the extreme formulation of Example 20, Question 29 (...whole of your life...) makes it difficult to agree with the statement. Mostly though, both suggestion and impertinence tend to develop throughout a questionnaire rather than occur in specific questions. This makes vigilance all that more important.

3. Questionnaire Design

Placing this section after Question Specification does not imply that design need not be considered until late in the research; the reality is that the design cannot be finalised until some idea of the content is known. Having examined the range of possible question structures, it then becomes easier to produce the overall questionnaire form.

Figure 3.1 Engineer Training Survey Questionnaire (extract)

7. IMPROVEMENTS						Computer Coding		
Which of the following suggestions do you believe would help to improve your performance in your present job?								
RATE 1 to 5 WHERE 1 = LITTLE OR NO USE...5 EXTREMELY USEFUL								
		1	2	3	4	5		
i	Experience in another type of department						C60	
ii	Experience in same department with different problems						C61	
iii	Experience in another firm with same type of job						C62	
iv	A short course of training suitably designed						C63	
v	An extended educational course						C64	
8. REORGANISATION								
(a) If the company decided to sponsor a short training course (say 2 weeks) would it be possible for your work to be organised in the department so that you could attend such a course								
		YES		1				C65
		NO		2				
(b) Would the time needed for a reorganisation be:-								
		Less than a fortnight		1				C66
		From 2 weeks to 3 months		2				
		More than 3 months		3				

9. UNFAMILIARITY

Computer Coding

(a) How often are you faced with unfamiliar problems?

Frequently		1
Not very often		2
Never		3

C67

(b) Which, if any, of these sources do you use to seek information or guidance in solving novel problems?

Technical books		1	C68
Technical periodicals		2	C69
Trade or Industrial Associations		3	C70
Professional Institutions		4	C71
Past records or designs in the firm		5	C72
Your supervisor		6	C73
Your colleagues		7	C74
Other departments with specialised knowledge		8	C75
Other firms' products		9	C76
Other firms' expertise		10	C77
Other sources (please specify)			

10. APPRENTICESHIP

What improvements would you suggest in the firm's graduate/ other apprenticeship?

3.1 Theme

The general theme of the questionnaire should be made explicit, either in the covering letter or in the questionnaire heading, or both. This ensures that respondents know what they are committing themselves to and also that they understand the context of the replies.

3.2 Appearance

The surest way of deterring a potential respondent is to send out a hastily constructed and untidy questionnaire. Appearance is usually the first feature of the questionnaire to which the recipient reacts. A neat and professional look will encourage further consideration of your request, increasing your response rate. In addition careful thought to layout should facilitate both completion and analysis. There are several simple rules to help improve questionnaire appearance.

1. Liberal spacing makes reading easier.
2. Photoreduction can produce more space without reducing content.
3. Consistent positioning of response boxes, usually to the right, speeds completion. It also avoids inadvertent omission of responses.
4. Choose the **typeface** to maximise legibility. If photoreduction is to be used, capitals being bigger are more legible.
5. Differentiate between instructions and questions. Either lower case and capitals can be used, or responses can be boxed.
6. Allow space for any computer coding that may be needed.

Figure 3.1 shows a section from a questionnaire on engineering training and experience. It demonstrates the value of clear visual design. Instructions, questions and responses are all easily differentiated and the consistent pattern saves the effort of deciding where to place each answer. The computer coding space is alongside.

The immediate benefit of photoreduction is seen in Figure 3.2. Reducing 2 A4 sized pages down to a single A4 page produces ample space without restricting the page content. A further advantage of reduction is the substantial saving in paper.

Figure 3.2 Example of a photoreduced questionnaire

BACKGROUND INFORMATION		Checklist Number	Computer Coding C1234										
The following background information will enable us to examine the extent to which different posts involve different teaching activities. Please indicate your own situation by ticking the appropriate boxes.													
1. <u>Sex</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Male</td> <td style="width: 20px; text-align: center;">1</td> </tr> <tr> <td style="padding: 2px;">Female</td> <td style="width: 20px; text-align: center;">2</td> </tr> </table>	Male	1	Female	2	C5 C6							
Male	1												
Female	2												
2. <u>How long have you been teaching?</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">First year</td> <td style="width: 20px; text-align: center;">1</td> </tr> <tr> <td style="padding: 2px;">1 - 5 years</td> <td style="width: 20px; text-align: center;">2</td> </tr> <tr> <td style="padding: 2px;">6 - 15 years</td> <td style="width: 20px; text-align: center;">3</td> </tr> <tr> <td style="padding: 2px;">over 15 years</td> <td style="width: 20px; text-align: center;">4</td> </tr> </table>	First year	1	1 - 5 years	2	6 - 15 years	3	over 15 years	4	C7			
First year	1												
1 - 5 years	2												
6 - 15 years	3												
over 15 years	4												
3. <u>What subject(s) do you teach?</u> Please list in order of time spent (most first).	1. _____ 2. _____ 3. _____	C8 C9,10											
4. <u>What scale are you on?</u> Please leave blank if you prefer not to answer.	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Scale 1</td> <td style="width: 20px; text-align: center;">1</td> </tr> <tr> <td style="padding: 2px;">Scale 2</td> <td style="width: 20px; text-align: center;">2</td> </tr> <tr> <td style="padding: 2px;">Scale 3</td> <td style="width: 20px; text-align: center;">3</td> </tr> <tr> <td style="padding: 2px;">Scale 4</td> <td style="width: 20px; text-align: center;">4</td> </tr> <tr> <td style="padding: 2px;">Senior Teacher</td> <td style="width: 20px; text-align: center;">5</td> </tr> </table>	Scale 1	1	Scale 2	2	Scale 3	3	Scale 4	4	Senior Teacher	5	C11	
Scale 1	1												
Scale 2	2												
Scale 3	3												
Scale 4	4												
Senior Teacher	5												
5. <u>Do you hold any additional responsibilities that affect your job content?</u> (e.g. Hd. of Dept/Year Hd/Exams/Resources etc.)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">No</td> <td style="width: 20px; text-align: center;">1</td> </tr> <tr> <td style="padding: 2px;">Yes</td> <td style="width: 20px; text-align: center;">2</td> </tr> </table>	No	1	Yes	2	C12							
No	1												
Yes	2												
<u>If YES, please indicate:</u> _____ _____ _____ _____		C13 C14											

3.3 Size

There may be a strong temptation to include any vaguely interesting question but this should be resisted at all cost. Excessive size can only reduce response rates. If a long questionnaire is necessary then even more thought must be given to appearance. Photoreduction helps, if only by making the task of completion look smaller. Pages are best left unnumbered; to flick to the end and see page 27 can be highly discouraging.

3.4 Mixture

Mixing questionnaire content is another way of encouraging responses. A continuous sequence of YES/NO questions can be very tedious. By switching between 2 or 3 different question structures and topics, interest is more easily maintained. However, the danger here is of excessive variation. If the respondent never has time to adjust to a particular response format, frustration may be induced along with the accompanying unreliability. The semantic differential is especially valuable since it is intrinsically appealing and at the same time, it allows a lot of information to be supplied quickly.

3.5 Order

Probably the most crucial stage in questionnaire response is the beginning. Once a respondent has started to complete the questions he will normally finish the task unless it is inordinately long or difficult. Consequently the opening questions need to be selected with care. Usually the best approach is to ask for biographical information first. This tends to be the easiest because the respondent should know all the answers without much thought. Furthermore, interest should immediately be aroused since most people enjoy talking about themselves. Another benefit is that an easy start provides practice in answering questions. On the other hand there are situations where biographic data can have the opposite effect. For example, some teachers are sensitive about their qualifications. A rather more important consideration, however, is whether the insertion of biographic content will disturb the continuity of points made in the covering letter. If the theme has been clearly established in this letter, it may be advisable to continue that line of questioning in the opening sections of the questionnaire itself.

Once the introduction has been achieved the subsequent order will depend on many considerations, some of them such as mixture having already been mentioned. One possibility to be aware of is the varying importance of different questions. Essential information should appear early, just in case the questionnaire is not completed. For the same reason relatively unimportant questions can be placed towards the end. If any questions are likely to provoke the respondent (questions about politics, for example) these too may best be left until the end, in the hope of obtaining answers to everything else.

Anyone who has played the game where you describe an object such as a bicycle, using only words, will know how difficult it is to provide clear and unambiguous verbal instructions. The questionnaire designer cannot avoid this problem. Within most questionnaires there are **general instructions** and **specific instructions** for particular question structures. It is usually best to separate these, supplying the general instructions as a preamble to the questionnaire, but leaving the specific instructions until the questions to which they apply. The response method should be indicated (circle, tick, cross etc.). Wherever possible, and certainly if a slightly unfamiliar response system is employed, an example helps greatly in confirming that the verbal instructions have been understood.

EXAMPLE Instructions for semantic differentials

Job Description

One objective of the present research is to look at different methods of obtaining descriptions. You have already used the checklist to tell us what your job entails. We would now like you to try to describe your job in another way.

Instructions

Listed below are a number of pairs of contrasting words which might be used to describe what a job is like. To assess your own job please circle one of the numbers along each scale. The numbers between the words allow you to say how much your job is like either of the words. The closer your choice is to one end of the scale the more strongly you feel that end of scale best describes your job. For example, if you feel that your job is very closely related to the word at one end of the scale, you should circle a number as follows:

easy ① 2 3 4 5 6 7 difficult

or

easy 1 2 3 4 5 6 ⑦ difficult

If you feel that your job is quite closely related to one or other end of the scale, you should circle either 2 or 6. If, on the other hand, it is only slightly related to one side as opposed to the other then you should circle either 3 or 5. You may consider that both adjectives are equally associated with your job or that the scale is completely irrelevant. In either case, you should circle 4.

Please remember:

- (1) Consider the words at both ends of the scale before making your decision.
- (2) Circle ONE number only on a given scale
- (3) DO NOT OMIT ANY ITEMS; BE SURE TO CIRCLE A NUMBER FOR EACH SCALE.

One trivial but effective instruction is to ask the respondent to complete the questionnaire using a **colour** other than black (assuming that the form is printed in black). Bright colours such as red or green make the subsequent coding and analysis substantially quicker.

The importance of questionnaire instructions is often underestimated. Certainly the piloting should test the clarity of the instructions as well as the questions and method.

3.7 Automation

Much as the arrival of piles of completed questionnaires might seem to signal the last lap of the exercise, reality is usually less optimistic. In most cases the coding and analysis of these questionnaires takes at least as long as all the preceding stages put together. One way to lessen the load is to incorporate as much automation into the questionnaire design as possible. At the simplest level, ticking a numbered response box means that all the researcher has to do is transfer the appropriate code to the coding box.

EXAMPLE

Q7 What is your age?

Categories	Answer	Coding
20 or under	1	
21 - 25	2	✓
26 - 30	3	
over 30	4	

Q7

C12
2

However, a substantial saving in time and effort can be achieved by extending the method. The respondent is asked to select an answer code and then to insert that code in the appropriate box. As long as the procedure is explained sufficiently clearly (an example is essential here) there is little extra effort on the part of the respondent, but the benefit to the researcher is considerable.

EXAMPLE

Q7 What is your age

Response	Code	Coding
20 or under	1	
21 - 25	2	
26 - 30	3	
over 30	4	

Answer to Q7

C12
2

The saving is completed by labelling the answer boxes with the corresponding computer card column (in the above case, column 12). This means that once the forms have been checked for completeness, they can be passed directly to the data preparation service.

3.8 Thank you

Respondents to questionnaires rarely benefit personally from their efforts and the least the researcher can do is to thank them. Even though the covering letter will express appreciation for the help given, it is also a nice gesture to finish off the questionnaire with a further thank you:

THANK YOU FOR COMPLETING THIS QUESTIONNAIRE

If at all possible some information should also be made available to interested participants. A final comment to the effect that a summary of the findings is available on request is evidence of genuine gratitude.

4. Piloting

Piloting is an integral part of any research and a questionnaire survey is no exception. Indeed the strong dependence upon the instrument rather than the researcher makes pilot assessments even more necessary. These need to evaluate the instructions, the questions and the response systems. Also if a novel distribution method is to be adopted (see next section) that too must be tested. And on top of all that it is likely that more than one pilot will be needed because any changes suggested by the first pilot will themselves require testing, albeit less extensively.

Although the piloting of a questionnaire might seem rather laborious, it would be wrong to assume that the effort is unproductive. The information collected at the pilot stage can itself be of value. For example, if everyone says YES to a question, then that question can usually be dropped from the main study because the answer is known, and because it has no discriminatory value. A second benefit is that the pilot data can be used to test the coding and analytical procedures to be performed later. Indeed, wherever possible all the anticipated coding and analytical procedures should be tested using the pilot data. Any alterations resulting from this test can then be incorporated in the final form of the questionnaire. To try out the analytical procedures it will be necessary to select appropriate statistical methods (see Rediguide 20, **Statistical Strategies**) and then to discover what facilities are available for performing those methods. If computer analysis is intended then the various constraints imposed by available programs (coding systems, maximum sample size, maximum number of variables etc.) will also need to be ascertained. Rediguide 19, **Computer Usage** gives further guidance here. Probably the most general rules are **not** to use letters in the coding system, and **not** to use multipunching.

Pilot procedures normally involve a small-scale application of the main method, but with a questionnaire some modification of this pattern may be desirable particular it is usually advisable to administer some questionnaires personally so that the respondent can be observed, and questioned if necessary. By timing each

question it becomes possible to identify any questions that appear inordinately difficult, and also a reliable estimate of the anticipated completion time can be obtained for inclusion in the covering letter. The standard concepts of **reliability and validity** have limited relevance in questionnaire design. Validity is typically assessed in terms of face validity, more often than not a euphemism for doing nothing. If any more objective measure is available (for example, groups of respondents expected to show different responses), then it should be considered. Reliability is slightly more accessible. Often some of the information is available elsewhere (on school records, for example) and checking may be practicable within the small pilot sample. Alternatively the respondent can be questioned personally to see how far these more lengthy responses match the earlier questionnaire answers. In general, piloting is far too often ignored, and the resultant disaster becomes all too predictable.

5. Distribution and return

No matter how meticulously the sampling procedures outlined in Rediguide 4, **Sampling**, have been pursued, the researcher using questionnaires for data collection remains heavily dependent upon response rates. Since the best guarantee of efficient sampling is a high response rate, distribution and return arrangements become vital parts of the research design.

5.1 Method

Cost, effort, delay and willingness are just a selection of the factors affecting choice of distribution method and therefore no single ideal procedure can be offered. Usually relative advantages and disadvantages will have to be offset and a compromise solution reached. However, it is possible to isolate three main considerations.

Personal or postal: Although postal distribution is perhaps the most popular method, there may be situations where it becomes preferable or even essential to deliver the questionnaire personally. Two obvious examples are where the sample is small making a high response rate vital, or as a follow-up after postal circulation has failed to produce a response. Whilst postal circulation is usually cheaper, personal contact is often quicker.

Direct or indirect: Where the sample members fall into convenient groups such as schools, classes or colleagues, it may be possible to contact them indirectly using an agent within the group. This can be particularly helpful at the return stage, since the agent can usually be enlisted to remind or encourage some of the less cooperative participants. However, the indirect contact may not be possible if anonymity is an important consideration. The general problem of anonymity is discussed later in Section 5.7

Nominated or chance: In most instances the subjects will have been identified individually beforehand. Occasionally, however, all that is required is a suitable number of responses and then it may be possible to avoid the effort and expense of nominating specific subjects. Instead chance respondents are obtained, either one-by-one, or by distributing batches of questionnaires to suitable collection centres. The main disadvantage of the chance method is that being self-selected, chance respondents may not be representative of the characteristics the sample was intended to cover.

In specifying the precise method to adopt, these three considerations are taken independently so that for example, the final choice might be for a **postal indirect nominated distribution**. Furthermore, the return can be different from the distribution. Thus the above distribution example might favour an alternative return method, say **postal direct**. The distribution and return procedures are separate and should be considered on their own merits.

5.2 Contents

As well as the **questionnaire** itself, it is normal to send a **covering letter** and possibly a **stamped addressed return envelope**. If the questionnaire is especially complicated it may also be necessary to supply a separate set of **instructions**. The questionnaire should be checked for **completeness** to ensure that all pages are present and that none is blank or illegible. The covering letter should be reasonably explicit regarding the aim of the inquiry. It should admit that the request does make certain demands of the respondent's time, offering an estimate if possible. The letter should not be effusive or ingratiating. Instructions for **return** should be included but those for completion should be on the questionnaire. The **return date** must be obvious; the easiest solution is to print it in block capitals on a separate line:

....It would be appreciated if you could
return the completed questionnaire by:
TUESDAY JANUARY 17th
if at all possible...."

Notice that both day and date are given since the day of the week acts as a stronger reminder. It is rarely worth allowing more than two weeks from receipt of the questionnaire because longer times only encourage procrastination. The covering letter should also include an assurance of **confidentiality** specifying the range beyond which the information will not pass (usually the research team only). Also if **official permission** or support has been sought, for example from the Local Education Authority, it is advisable to mention this. Certainly where parents are involved, they are unlikely to co-operate fully in a survey which does not have the blessing of the school head or the Authority. They may not be interested in helping even if they are aware of official support, but that is a different matter.

5.3 Returns

Returned questionnaires, completed or otherwise, usually show an initial surge, followed by a gradually decreasing flow, the later ones often take 4 or 5 times as long to arrive as the early ones. To make best use of the period, processing should begin as soon as the first ones are received. Arrival date should be noted and the questionnaire numbered, unless it is already. The contents should be checked for completeness since it may be possible to return a questionnaire if any sections have been inadvertently missed. Coding is also best started immediately because the task is both tedious and time consuming if attempted at one marathon sitting. In all cases, the coding scheme should leave space at the beginning for a number assigned to completed questionnaires. Further guidance on coding is given later in Section 6, and also in Rediguide 19, **Computer Usage**.

5.4 Follow-up

It will rarely be possible to accept the initial response as sufficient without some effort to increase it. The follow-up request should not be left too long otherwise what little interest the non-respondent had will have disappeared altogether. The tone of the follow-up letter should acknowledge the difficulty that person might have in complying with your request, but it needs to emphasise the importance of every single questionnaire. A replacement questionnaire should be included "in case of misplacement or loss". Occasionally as a last resort, it may be practicable to supply a shorter follow-up questionnaire, covering only the essential parts. Should the response rate still be unsatisfactory, even after the follow-up, it may be worth considering a personal visit or telephone call, rather than a further letter. Follow-up requires some form of respondent identification and therefore if an agent is used for distribution, or if anonymity is essential, special arrangements may be required. In extreme cases, follow-up may not be possible at all.

5.5 Response rates

Response rates are so dependent upon the nature of the questionnaire that general statements have little value. A response rate under 50% must be considered of dubious validity unless representativeness can be established. With larger samples, 70% may be satisfactory, but for small samples it may be necessary to exceed 90% simply to meet statistical requirements. However, more often than not, the important criterion is not the response rate but response representativeness. It may be necessary to incorporate questions specifically for the purpose of checking representativeness over certain characteristics. If the accuracy of a 50% sample can be guaranteed, empirically or otherwise, then so long as its size is suitable for the subsequent analyses, any further follow-up may be superfluous.

5.6 Non-response

The impersonal nature of questionnaire administration almost invariably results in some contacts not responding, even after follow-up letters. The two serious consequences are that the sample size may be too small for reliable statistical analysis, or that the residual sample might be unrepresentative of the target population. The former of these eventualities is relatively easy to handle in that the solution is obvious even though it may require effort. The second possibility may raise problems. A crude check on the representativeness of the residual sample is to examine known characteristics. These will vary with the topic under investigation, but often details of age or sex, for example, are available for the main population, enabling the comparison to be made. Sometimes a similar comparison may be practicable for the non-respondents, certainly for sex anyway. Should no useful information be available for non-respondents, one ploy that has been suggested is to compare **late respondents** with the reference population since these cases tend to exhibit similar characteristics to non-respondents.

5.7 Anonymity

Some form of identification must be devised initially if only to enable any necessary follow-up to be made. There may also be a need to link data, collected on different occasions. Usually, however, all that is required during processing is an index number, apart from maintaining a private master list relating these numbers to individuals. Questionnaires should be kept secure, and destroyed at the earliest opportunity, although the practicability of this will depend on the efficiency with which the responses can be coded.

6. Coding and recoding

The same coding principles apply to questionnaires as do to most other types of data. Since Rediguide 19, **Computer Usage** treats coding in detail, only brief comments are necessary here. The general aim in questionnaire coding is to produce exclusive and exhaustive categories for supplied answers. These categories are then assigned numeric labels so that the information can be transferred to computer input. Usually it is best to start from 1 rather than 0; this allows zero to be used as a missing data code. With small-scale studies where computer analysis is not intended, the numeric coding required may be relaxed to permit alphabetic codes. However, a study does not have to be very large before computer processing becomes essential if anything approaching a comprehensive analysis is needed.

The initial coding system should maintain suitably fine detail or discrimination since subsequent recoding can usually produce any coarser categorisation that eventually seems desirable. Indeed, recoding should be considered an inevitable stage in questionnaire analysis. Even if the preliminary categories seem acceptable from the research standpoint, it is unlikely that they will be appropriate for all the statistical analysis needed later. The value of recoding can readily be seen from

an example taken from the Engineer Training Survey Questionnaire already mentioned. Originally the qualification question was coded into nine categories ranging from city and guilds (code 1) to postgraduate and technical qualifications (code 8) and no qualifications (code 9). When a more general classification seemed worthwhile a simple graduate/non-graduate dichotomy was generated by combining the relevant codes. Most computer programs that offer tabulation also incorporate a facility for automatic recoding according to a supplied specification.

The final comment on coding might seem obvious but hindsight emphasises its importance. It concerns the need to keep a careful record of all the coding and recoding performed. The variety of question forms makes it impossible to remember every detail and to return to the data later without this information can be a frustrating experience.

7. Tabulating the responses

The bulk of questionnaire analysis consists of tabulating for every question the frequency or percentage of responses falling into each response category. With or without computer assistance, this stage presents few conceptual problems, although the excessive time needed for hand tabulation makes computer analysis the more sensible approach except for very small samples.

EXAMPLE Distribution of qualification responses (N = 199)

Code	Description	Total	Percent	Cumulative percent
1	City & Guilds	11	6	6
2	ONC	26	13	19
3	HNC	71	36	54
4	HND	7	4	58
5	First Degree	35	18	75
6	Postgraduate	2	1	76
7	Degree & Technical	3	2	78
8	Other	3	2	79
9	None	41	21	100

Where the number of categories is small, a tabulation like this is reasonably interpretable as it stands. The percentage can be of the total sample, or excluding non-responses. Since all responses are present, both methods produce the same result. Normally this would not be the case and then percentages are best calculated after omitting non-responses. The cumulative percentage, obtained by sequentially adding the individual percentages, is only interpretable if the codes are ordered in some meaningful way. Here they are not and therefore that column is ignored. In computer analysis selection of relevant results is a recurring consideration, since the need for output to be comprehensive inevitably results in redundancy on occasions.

8. Cross-tabulation

Once the incidences of the various categories have been tabulated, it is normally desirable to extend the analysis to examine the relationship between different questions. **Cross-tabulation** not only enables these correspondences to be seen, but also allows a statistical test of the significance of the relationship to be performed.

As an example, consider the possibility that different engineers place varying degrees of importance on extended courses of training. Since graduates have already had such an experience, one might expect them to show relatively little support for further extended training. Maybe the relationship is more complicated than that. It could be that age also needs to be taken into account since the older engineers graduate or otherwise are unlikely to value extended training very highly, largely through their limited job mobility. As the network of possibilities is extended, so the subsequent analysis becomes more elaborate. The next two sections demonstrate how statistical analysis can be used to uncover relationships like the one of engineer's attitudes to extended training. The first step is to limit the comparisons to two questions or variables at a time, by means of two-way tabulations, otherwise known as **contingency tables**.

EXAMPLE Relationship between qualification and the value placed on an extended course of training (N = 199)

Qualification	Value of future extended courses						TOTALS
	HIGH	5	4	3	2	1 LOW	
1 CITY & GUILDS	4	1	1	0	5		11
2 ONC	3	3	6	5	9		26
3 HNC	10	13	13	11	24		71
4 HND	1	0	3	0	3		7
5 DEGREE	1	3	6	13	12		35
6 POSTGRADUTE	1	0	0	1	0		2
7 DEGREE & TECHNICAL	0	0	0	0	3		3
8 OTHER	1	0	1	0	1		3
9 NONE	8	4	6	8	15		41
TOTALS	29	24	36	38	72		199

Chi-square	36.82
Degrees of freedom	32
Probability	0.260

Although this table contains all the information obtained regarding the preceptions of the different qualification types, as it stands it is difficult to discern any pattern in the relationship. One solution is to refer to the statistical data. The **chi-square** analysis tests the degree to which the distribution of responses throughout the table

differs from a chance pattern. The **probability** value gives the likelihood of the pattern being random, a high value indicating as highly likely chance result. Consequently for **statistical significance** this probability must be small. Traditionally levels of .05 (one chance in 20) or .01 (one in 100) are accepted, the latter being more significant. Since the probability here is .26 it is too high to be statistically significant, implying that no discernible relationship exists.

If a significant value for chi-square is obtained, all that can be said is that there is a tendency for certain categories of response on one variable to be associated with particular responses on the other. The only way the precise nature of this relationship can be detected is by inspection of the cell frequencies, or better still, the percentages.

9. Refining the analysis

It is the large size of the above table, together with wide fluctuations in the frequencies for each qualification category that makes visual inspection of the table unsatisfactory. Furthermore large tables are more likely to contravene the assumptions of chi-square analysis (see Siegel, 1956 for details). **Recoding** into fewer categories usually facilitates both the visual and statistical analysis of the table so long as suitable combinations of the codes are selected. The following table demonstrates the benefit of recoding qualification into a graduate/non-graduate dichotomy and attitude into 3 rather than 5 categories.

EXAMPLE Recoded qualification and attitude compared (N=158)

RECODING SPECIFICATIONS

Qualification	1	NON-GRADUATE	Original codes	1 2 3 4 8
	2	GRADUATE	Original codes	5 6 7
Attitudes	1	LOW VALUE	Original codes	1 2
	2	INTERMEDIATE	Original codes	3 4
	3	HIGH VALUE	Original codes	5

Value of further extended training

Qualification	HIGH	MIDDLE	LOW	TOTALS
NON-GRADUATE	36	40	42	118
GRADUATE	5	20	15	40
TOTALS	41	60	57	158
Chi-square	5.803			
Degrees of freedom	2			
Probability value	.054			

Notice that fewer cases are included in the recoded table following the removal of those with no qualification. The pattern is now clearer and although the chi-square value falls marginally short of statistical significance (probability = 0.54) there does appear to be a tendency for fewer graduates to place high value on extended training. Transforming the frequencies to **row percentages** should help clarify this impression.

EXAMPLE Qualification percentages compared with attitude (N=158)

Qualification	Value of future extended training			TOTALS
	HIGH	MIDDLE	LOW	
NON-GRADUATE	31%	34%	36%	118
GRADUATE	13%	50%	38%	40
TOTALS	41	60	38	158

The percentages confirm that rather few graduates (13% compared with 31%) rate future extended courses highly whilst the low value proportions are very similar.

A further refinement that can often help reveal a significant relationship is to introduce a third variable (question) into the analysis, by constructing a **three-way tabulation**. Taking age as a suitable third dimension, the procedure involves producing separate tables for selected age categories. Three-way tabulations do tend to generate a proliferation of tables and the number of categories for the third variable should be kept small. With age the simplest solution is to dichotomise at 40, resulting in a young group of size 85 and an old group of size 73.

When only the young engineers are examined the pattern is clarified to the extent that the chi-square analysis now produces a significant result ($p = .037$). The interpretation is as before; the graduate young engineers place lower value on future extended training courses than the non-graduate young engineers. Since the latter mostly have not received the benefit of such training whilst the graduates have, this finding should not be surprising. Nevertheless, the demonstration does show the iterative nature of questionnaire analysis, each stage requiring careful thought before further refinement is attempted.

10. Further analysis of questionnaires

When the design of questionnaires was discussed, it was pointed out that certain question structures have associated with them a specific analytical method. So if sets of related items are to be identified and analysed together, then some form of factor analysis is likely to be needed to generate these subscales. Kaiser's oblique method (Kaiser and Rice, 1974) is particularly suitable. The approach that the present writer has found especially productive is to apply cluster analysis to identify groups of respondents with similar response patterns. However, since the initial

coding system seldom meets the requirements of clustering methods which operate on at least ordinal data, some form of recoding will usually be necessary prior to clustering. Although the recoding procedure, involving the use of dummy variables, is not difficult, it is too elaborate to justify explanation here. Those interested should refer to an extended description elsewhere (Youngman et al, 1978) which uses the questionnaire already treated in earlier sections of this guide. The same reference also contains an account of the use of factor analysis to produce subscales.

Without doubt the eternal dilemma of questionnaire analysis is when to stop, given the massive amounts of data usually produced. It is just this situation that makes some form of summary analysis such as cluster analysis invaluable. Apart from supplying an inherently beneficial analysis, the overview achieved can also highlight specific areas for which finer analysis might be particularly worthwhile. And there is no reason why this extra detail has to be obtained statistically; if interviews or case studies seem more appropriate then those approaches can also be used to add extra power to the basic questionnaire method.

References

- COHEN J. (1968) 'Multiple regression as a general data - analytic system' *Psychological Bulletin*, 70, 426-443.
- KAISER H.F., RICE J. (1974) 'Little Jiffy Mark IV'. *Educational and Psychological measurement*, 34, 111-117
- KERLINGER F.J. (1973) *Foundations of Behavioral Research*. Second Edition. New York; Holt, Rinehart and Winston.
- OPPENHEIM A.N. (1966) *Questionnaire Design and Attitude Measurement* London, Heinemann.
- SIEGEL S.S. (1956) *Non-parametric Statistics for the Behavioral Sciences* New York, McGraw-Hill
- TUCKMAN B.W. (1972) *Conducting Educational Research*. New York, Harcourt Brace Jovanovich.
- YOUNGMAN M.B., OXTOBY R., MONK J.D., HEYWOOD J. (1978) *Analysing Jobs*. Farnborough, Gower

Index

- Administration 23
- Analysis 3, 7, 10, 23, 28-32
- Anonymity 24, 27
- Appearance 18
- Automation 22
- Categories 7, 11, 14, 20
- Chance Distribution 25
- Checklists 7
- Chi-square 29
- Cluster Analysis 32
- Coding 3, 10, 11, 23, 27
- Completeness 22, 25
- Complexity 11
- Computer coding 16, 18, 22, 23, 27
- Confidentiality 25
- Consistency 14, 18
- Contents 25
- Covering letter 25
- Cross-tabulation 28
- Descriptions 6
- Design 15-23
- Difficulty 10-15
- Direct distribution 24
- Distribution 3, 24
- Double negatives 12
- Double questions 13
- Dummy Variables 32
- Excessive elaboration 14
- Excessive precision 11
- Fact 4, 11
- Factor analysis 31
- Feedback 23
- Follow-up 26
- Identification 27
- Impertinence 15
- Impossible questions 11
- Indirect distribution 24
- Instructions 9, 18, 21, 25
- Intermediate responses 9
- Interviews 3
- Introduction 20
- Intrrospection 11
- Late responses 27
- Length 7, 20
- Likert scales 8
- Lists 7
- Mixture 20
- Nominated distribution 25
- Non-responses 3, 9, 10, 20, 27, 28
- Numbering 26
- Official permission 25
- Open-ended questions 3, 5
- Opinion 4
- Order 20
- Parents 25
- Partial agreement 8
- Percentages 28, 31
- Personal information 20
- Photo-reduction 18, 19
- Piloting 9, 10, 23
- Planning 3
- Postal return 24
- Precision 5, 11
- Probability 30
- Question specification 3-15
- Question structure 6-10
- Questionnaire design 15-23
- Rankings 10
- Ratings 9
- Recoding 27, 30
- Records 28
- Refining analyses 30
- Reliability 24
- Representativeness 26
- Respondent ease 6, 20
- Response method 21
- Response overlap 10
- Response rate 18, 26
- Return 24
- Return date 25
- Scales 6, 8
- Semantic differentials 9, 21

- Size 20
- Sources 3
- Statements 6
- Statistical significance
- Structured questions
- Sub-questions 12
- Suggestion 15
- Tabulation 28
- Thank you 23
- Theme 5, 18
- Three-way tabulation
- Timing 10, 24
- Typeface 18
- Validity 24
- YES/NO question 5