Research Methodology: Questionnaire Issues

by

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In the last issue we explored some of the basic, fundamental, issues in research methodology. In this issue, the second part of a trilogy devoted to research methodology, we explore issues surrounding questionnaires and examine some of the key factors researchers need to be aware of.

The Questionnaire Design

There is an abundance of literature on various facets of undertaking a mail questionnaire, yet this has not improved the design of questionnaires, particularly at the doctoral level. In an attempt to avoid errors in designing a questionnaire, a literature review is invariably helpful. A brief overview of the more pertinent literature on the subject follows.

Ghauri et al. (1995) suggest that questionnaire design should begin by specifying the information required in whom the questionnaire is being sent, how it is to be administered etc.

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Gill and Johnson (1991) argue that in undertaking a survey, the ability to structure, focus, phrase and ask sets of questions in a manner that is intelligible to respondents is vital. Furthermore, they go on to suggest that such questions also need to minimise bias, and provide data that can be statistically analysed. Within this framework, they suggest four inter-related issues in questionnaire design that need to be addressed as part of the overall questionnaire format: questionnaire focus, question phraseology, the form of response, and question sequencing and overall presentation.

Similar comments are offered by Ghauri et al. 1995; and Webb, 1992; Paliwoda, 1981. Both Gill and Johnson (1991) and Paliwoda, (1981) offer a framework for constructing and testing of research questionnaires. Both of these approaches have been combined and synthesised with comments by other sources, in figure 8.

**Questionnaire focus**

This refers to the extent to which the questions intended to be asked cover the various aspects of the research problem adequately and in sufficient detail (Gill and Johnson, 1991). Similarly, it is equally important to ascertain whether or not all the questions to be asked are really relevant to the research problem. A continuous process of assessment is needed to ensure that unnecessary questions that do not satisfy the objectives of the investigation are eliminated. Clearly a sharp and piercing questionnaire will reduce costs and in the case of mail surveys, should improve response rate (Gill and Johnson, 1991; Paliwoda, 1981; Fink and Kosecoff, 1985; Ghauri et al., 1995).

**Questionnaire phraseology**

Payne (1951) suggests that it is important to consider whether or not the ways in which questions are asked are intelligible to respondents. Ghauri et al. (1995) ask: can questions be interpreted complex wording or concepts are used, a note clarifying the precise context should be added. Cannell et al., (1981) advocate that an explanation or argument as to why differently?; would respondents be willing to give answers to the questions?; how long would it take for them to answer?; is it a sensitive issue?. They advise avoiding double meaning questions, thereby preventing negative contributions to the conclusions. They also suggest that if that particular question is being asked gives a better response rate. With regard to phraseology, Gill and Johnson (1991) propose six points which need to be considered with reference to the characteristics of the population from which the sample is drawn.

- Are the purposes of the research revealed to respondents in such a
way as to increase the probability of their co-operation without biasing subsequent responses?

- Are instructions to respondents clear and unambiguous? Are the questions understandable; free from jargon, esoteric terminology, inappropriate assumptions and ambiguity?

- Are the respondents likely to possess the requisite information and knowledge to answer the questions?

- Is it possible that respondents might find the wording of questions offensive, insensitive or embarrassing?

- Could the wording of the questions lead to bias through "leading" the respondents to particular answers or imposing assumptions that may be unwarranted?

The form of response

Given that data analysis usually entails computer-aided statistical manipulation, it needs to elicit in a form that permits such manipulation. It is therefore essential that measures of the variables significant to the research problem are built into the questionnaire by asking questions in an appropriate way and providing an appropriate pro forma for the responses. For a successful outcome, the questions need to be in a form suitable for the statistical techniques the researcher intends to use, bearing in mind the reliability and validity of the measurement scales actually encoded in the questionnaire design (Gill and Johnson, 1991). Ghauri et al. (1995) argue that consideration needs given to whether open-ended or closed-ended questions should be used; whether "Don’t know" or "No comment" alternatives should be offered—providing an escape route.

Scaling

In view of the importance of ensuring that the type of scale for measuring any variable is appropriate to the statistical techniques to be used during data analysis, Kidder and Judd (1986) differentiate four types of measurement scales: nominal, ordinal, interval and ratio, whilst Maranell (1974) offers more sophisticated aspects of scaling. Gill and Johnson (1991) stress that it is important to use the statistical methods appropriate for the types of measurement scales that have been previously encoded into the questionnaire format. They suggest that statistical techniques such as multiple regression, which depend on the distances between quantitative points on a scale being equivalent, for example, could not be used for nominal or ordinal data. It follows that how
Conceptualise and structure the research problem

(i) Consider the aims of the research
(ii) Review the current state of knowledge
(iii) Assess the various resources available

Analytical Survey?  Descriptive Survey?

Identify the independent, dependent and extraneous variables
Identify the phenomena whose variance you wish to describe

Determine the sampling strategy by defining the research population and designing a means of accessing a representative (random) sample

Is the data to be collected through one approach to respondents? Or does the nature of the research problem require the repeated contact of a single sample or several equivalent samples?

Interview-administered Questionnaire/Schedule
Respondent-completed/postally administered Questionnaire

Fig 7. Conceptualising and structuring the research problem
Figure 8 Designing and testing of a research questionnaire
Source: Gill and Johnson, 1991; Paliwoda, 1981
variables are operationalised and measured, and how this is encoded in the questionnaire design, needs to fit the statistical techniques to be employed, which in turn largely depends upon the aims and purposes of the research.

**Question sequencing and overall presentation**

In designing the format of a questionnaire (particularly where a mail self-completion questionnaire is being used), Gill and Johnson (1991) emphasize particular attention to the sequence of the questions to be asked. It is recommended that questions have a natural and logical order-easy to answer questions first, complicated ones later-such views are shared by Ghauri et al. (1995). Gill and Johnson (1991) also suggest that to assist rapport and respondent's understanding of what is required, more general and factual questions precede narrow, detailed questions and questions of opinion.

The quality of the overall presentation of the questionnaire, its conciseness and the attractiveness of the design are also of importance in ensuring a high completion rate, as is a suitable covering letter and a stamped addressed envelope for its return. Low completion rates are often a feature of surveys by questionnaire, particularly if administrated by post. An issue related to the above is whether respondents differ in a significant way from non-respondents. Gill and Johnson (1991) suggest two methods to resolve this first, by comparing the two groups of available characteristics; second by comparing the original respondents with those produced by follow-up letters.

Factor affecting response rates to mailed questionnaires are covered in detail by Herbelein and Baumgarten (1978).

**Validity and reliability**

Issues surrounding the use of the correct type of measurement scale raise problems associated with validity and reliability. Validity refers to the extent to which a scale encoded into a set of questions actually measures the variable it is supposed to measure (Martin and Bateson, 1986; Gill and Johnson, 1991). It is suggested that validity be assessed by evaluating the results against some other measure or criteria (Smith, 1975; Cronbach and Mezhl, 1979; Gill and Johnson, 1991).

Whereas validity refers to the accuracy of the measurement process, reliability refers to its consistency and repeatability (Martin and Bateson, 1986; Gill and Johnson, 1991). An easy way to test reliability is to replicate; either by administering the same questions to the same respondents at different times and assessing the degree of correlation, or by asking the same
question in different ways at different points in the questionnaire. More sophisticated ways of measuring reliability such as Cronbach Alpha, split-half methods, Dubin-Watson test, Kaiser Mayer Ohlin and Barlett’s test of sphericity have been suggested and detailed by Moser and kalton (1971) and Summers (1970).

Fieldwork

It is strongly recommended that fieldwork be initiated by conducting a pilot study (Gill and Johnson, 1991; Ghauri et al., 1995; Webb, 1992; Paliwoda, 1981. This involves essentially a trial run-through to test the research design with a sub-sample of respondents who have characteristics similar to those identifiable in the main sample to be surveyed. Such exercise is necessary because it is rather difficult to predict how respondents will interpret and react to questions. Conducting a pilot study before the main survey will highlight potential problems in the pro forma of the questionnaire which can be modified.

Sampling

Often, due to the impracticality of interviews and the subsequent decision to use a mail survey, a representative sample needs to be collected. Nachmias and Nachmias (1981) explain that the main aim of sampling is to make inferences about a certain parameter (specified value) that is unknown, from sample statistics that can be measured. Three elements requiring attention in a sampling procedure are the definition of population; the size of sample and the sample design. Whilst various statistical sampling techniques have been suggested (Ghauri et al., 1995; Webb, 1992; Fink and Kosecoff, 1985; Dillion et al., 1987) the nature of the research may make these inappropriate as well as impractical. In many cases, the sample comprises a total census of those companies/individuals actively involved in ones area of research. In this way, whatever the response rate elicited could, in theory, be held to be a sample of the total population. However, as Ghauri et al., (1995) note, such an approach does introduce a problem in that findings are representative of the population only if those people who do not respond to the questionnaire do not differ in significant ways from those who do respond. Being aware of such a difficulty, the questionnaires may need to be given a unique number to identify the respondents from those who did not respond.

Sources of data

Advice on sources of data is difficult to dispense. The sample can be the whole population or based on some
other sampling framework, the unit of analysis can be the firm, the individual etc. The task of obtaining the name and addresses of the population or sampling frame, however, need to be carried out simultaneously with the questionnaire design. This may involve, for example, contacting various government departments and agencies, commercial directories, media sources (for example in the business area: Financial Times, Acquisitions Monthly, The Economist, The Far Eastern Economic Review, The Wall Street Journal and numerous other electronic databases etc.)

Given the diverse sources of the information, it is not wholly unexpected that much work needs to be undertaken before a mailing list can be established.

**Establishing a mailing list**

The information collected from the above sources is usually not readily in a form suitable for immediate use. Often, the most appropriate person to contact is not apparent, the individual may have moved, the firm may have closed, relocated or may not be willing to cooperate etc.

To save costs on mailing, printing of questionnaires, avoiding reminders, as well as improving the response rate, a letter can be sent, enclosing a pre-addressed form (containing the fax number of the researcher or an e-mail address), to each company/individual, explaining the purpose of the research and asking for a contact name who could assist in completing a survey. This has, in the authors experience, been found to be the cheapest and most efficient way to obtain the required information. It is also possible, though not always, that once a contact has been secured, a personal relationship can develop, enhancing subsequent correspondence.

Following the faxed/e-mail responses, those firms/individuals refusing to cooperate for reasons of confidentiality, lack of time or staff or inappropriateness of their firm to the study can be eliminated. Any letters returned unopened, undelivered, indicating the firms had closed down, relocated etc. can also be eliminated. The responses can be put into a database, with contact names and addresses and other information, ready for mailing.

**Questionnaire production and mailing**

Using the above guidelines and advice a questionnaire can be designed, the extensive literature review should assist with the formulation of ideas and objectives. Following the steps in fig 8, a set of questions can be formulated and a draft questionnaire prepared. At this stage, particular attention needs to paid to the questionnaire focus, bearing in mind the suggestions of Gill and
Johnson (1991) and others. Throughout this period of scrutiny and rescrutiny, each question in the questionnaire has to find a justification for its inclusion. Firstly, is it likely to produce the variety of information sought by the researcher? Is the meaning clear and unambiguous to the respondent, as judged objectively by another? Could then the questions be shortened? During these deliberation, the six points suggested by Gill and Johnson (1995) serve a useful guide.

As mentioned earlier, the form of responses need to lend themselves to statistical manipulation as well as aiding respondents. The researcher should continuously ask the question: could the quality of information likely to be derived, be improved upon by substituting response scales in place of simple dichotomous yes/no question, which might also assist coding. In terms of scaling, the researcher has a wide choice, ranging from nominal to ratio.

At this stage the questionnaire can be divided into various sections, with particular consideration given to question sequencing and overall presentation as suggested earlier. The aspects covered in relation to presentation and layout are important as this can have an impact on response rate—the biggest disadvantage with mail surveys (Ghauri et al., 1995; Gill and Johnson, 1991; Webb, 1992; Greer and Lohita, 1994; Jobber et al., 1991; Herbelein and Baumgartner, 1978; Kalafatis and Madden, 1994).

The first page of the questionnaire needs to begin with an introduction of who it is from and what it is about, followed by an outline of the various sections. Step by step instructions need to be provided (for self-administered questionnaires) in how to fill in the questionnaire and the form of response the respondents are to encounter. The overall presentation can enhanced by, for example, using a double lined border on the first page, while the remainder of the survey can have single line borders, the questions themselves can enclosed in a shaded area to differentiate them from the responses.

The first draft of the questionnaire can be tested on fellow researchers, other academic staff or a small sample of the population. If practical and feasible, the test should, ideally, be carried out via interviews. The suggestions of the various individuals need to be given due consideration and incorporated, where possible, into the questionnaire. The main suggestions tend to relate to scaling and length of questionnaire, with perhaps minor changes in wording to avoid ambiguity. At this stage, a number of questions may need to be withdrawn to reduce length. The modified questionnaire should then be piloted by mail, to several companies/individuals chosen randomly from the sample. A covering

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1 For more ideas on scaling see, for example, Webb, 1992.
letter explaining the context of the questionnaire and requests for comments and suggestions should be sought. Such a request invariably makes the respondent feel important and more inclined towards helping. Significant comments, in the experience of the author, have included requests for space for additional comments by respondents, also that in some cases, people answering the questions genuinely did not know the answer to some questions and hence would be helped by a “Don’t know” alternative. Whilst researchers need to be aware of earlier comments by Ghauri et al., (1995) with regard to allowing escape routes, sometimes, on reflection and introspection, it may be the case that respondents “not knowing the answer” would itself be a useful indicator in explaining the profile of the respondents. Hence, on some dichotomous questions a “Don’t know” can be incorporated, although one should undertake this with reluctance and due caution. Further suggestions are often made that because some of the issues involved are too complex to be addressed by the format, space for “general comments” be catered for. These suggestions need to be duly incorporated and the questionnaire tested again, with different respondents before the revised questionnaires can be mailed.

The questionnaire should be accompanied by a covering letter and a reply-paid return envelope. The covering letter ideally should carry the symbol, name and address of the affiliated institute (i.e. university), in line with research carried out by Peterson (1975) and Greer and Lohita (1994) who found that a higher and quicker response rate was elicited where a university or academic society rather than a business was identified as the source of the questionnaire. Each letter should be personally signed, and have the name and address of the company executive individually typed on to the letter. Dillman and Frey (1974) had reported a slight improvement in response speed by use of personalised cover letters (individually typed with personal salutation and signature), although not enough to justify added costs. The name of the researcher needs to printed at the very end, after a greeting of thanks to the respondent completing the questionnaire.

It has been found that by promising respondents anonymity and asking them not to identify themselves on the questionnaire, can serve to increase response Futrell (1981). However, for follow-up and non-response bias, each questionnaire needs a unique code to enable identification. The respondent should, however, be given the opportunity to provide a name and address at the end of the questionnaire, if they wish to receive a copy of the findings. It is useful to suggest, even if fictitious, a deadline for the return of the questionnaires. This helps in follow up attempts.

When and how to follow up is very
much a matter of judgment and the research timeframe. Normally, a reminder needs to be sent after 2-4 weeks after the initial mailing, followed by a second wave of reminder letter and replacement questionnaires some two months later. A final reminder after about three months since the initial mailing is usually sent, after which, it can be assumed, with reasonable certainty, that further responses are unlikely. When to stop the data collection process, again, calls for a judgment on the part of the researcher, based on the research criteria. If statistical manipulation is going to be used to support the findings, a response rate of 25% (response rate being defined as the percentage of total questionnaires mailed that were returned by respondents), arguably should be acceptable, although this will be influenced by the length and complexity of the questionnaire (Hart, 1987).

The decision when to send reminders and replacement questionnaires should be arrived at after much thought and research. Kanuk and Berenson (1975) suggest that initial responses should come almost immediately after the initial mailing, with subsequent reminders providing diminishing returns. They further argue that the later respondents should match the non-respondents since people who respond in later waves are assumed to have responded because of the increased stimulus, and they are expected to resemble the non-respondents than those in earlier waves.

Manfield (1948) and Gray (1957) both found that the response rate patterns for the second wave were practically identical to the patterns for the first wave, Stanton (1930), however states that 90 per cent of the total possible returns to a mail questionnaire will be returned within three weeks following the first wave mailing.

Often respondents, although returning a competed questionnaire, complain that it is too long for busy executives. On reflection, with the benefit of hindsight, this is probably true in most cases, however, researchers would be advised to reflect on the comments of Kanuk and Berenson (1975):

“...Common sense suggests that shorter questionnaires should result in higher response rates than longer ones because of the limited demand they make on the respondent’s time: however, the evidence gives very little support to this view. The evidence does not indicate that short mail questionnaires are more likely to receive higher response rates than long questionnaire...”

Comparing the respondents with non-respondents in terms of profile, age, size, industry etc., needs to be checked for discernible response bias.
Response rate

Compared to other data collection methods, mail surveys (the method discussed in this article) are relatively low in cost, geographically flexible and can reach a large sample simultaneously. However, compared to personal and telephone interviews, the major disadvantage of mail surveys is their low response rate (Ghauri et al., 1995; Gill and Johnson, 1991, Webb, 1992, Fink and Kosecoff, 1985; Greer and Lohtia, 1994; Yu and Cooper, 1983; Jobber et al., 1991). Factors affecting response rates to mailed questionnaires are covered in detail by Herbelein and Baumgartner (1978).

In order to increase response rates, much research has been carried on the effects of various techniques such as survey sponsorship, personalisation of letter, format, colour, anonymity, premium and rewards (Greer and Lohtia, 1994). A literature review can be carried out to determine which factors will have a positive effect on the response rate, those found to show some positively correlation can be incorporated in the design of the questionnaire.

Concluding comments

Planning a survey, as this article demonstrates, requires much forethought. Researchers need to be aware of the pitfalls before the data collection actually takes place, particularly with regard to the statistical techniques which will subsequently be used. To address these important considerations, in the next issue we will examine some key factors in data analysis.
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