

## CHAPTER 7

# Writing up your research

### Chapter summary

- 7.1 The purpose of a report
- 7.2 Writing guidelines
- 7.3 The structure of a research report
- 7.4 Tables and figures
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- 7.10 Presenting a report
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### Cries for help

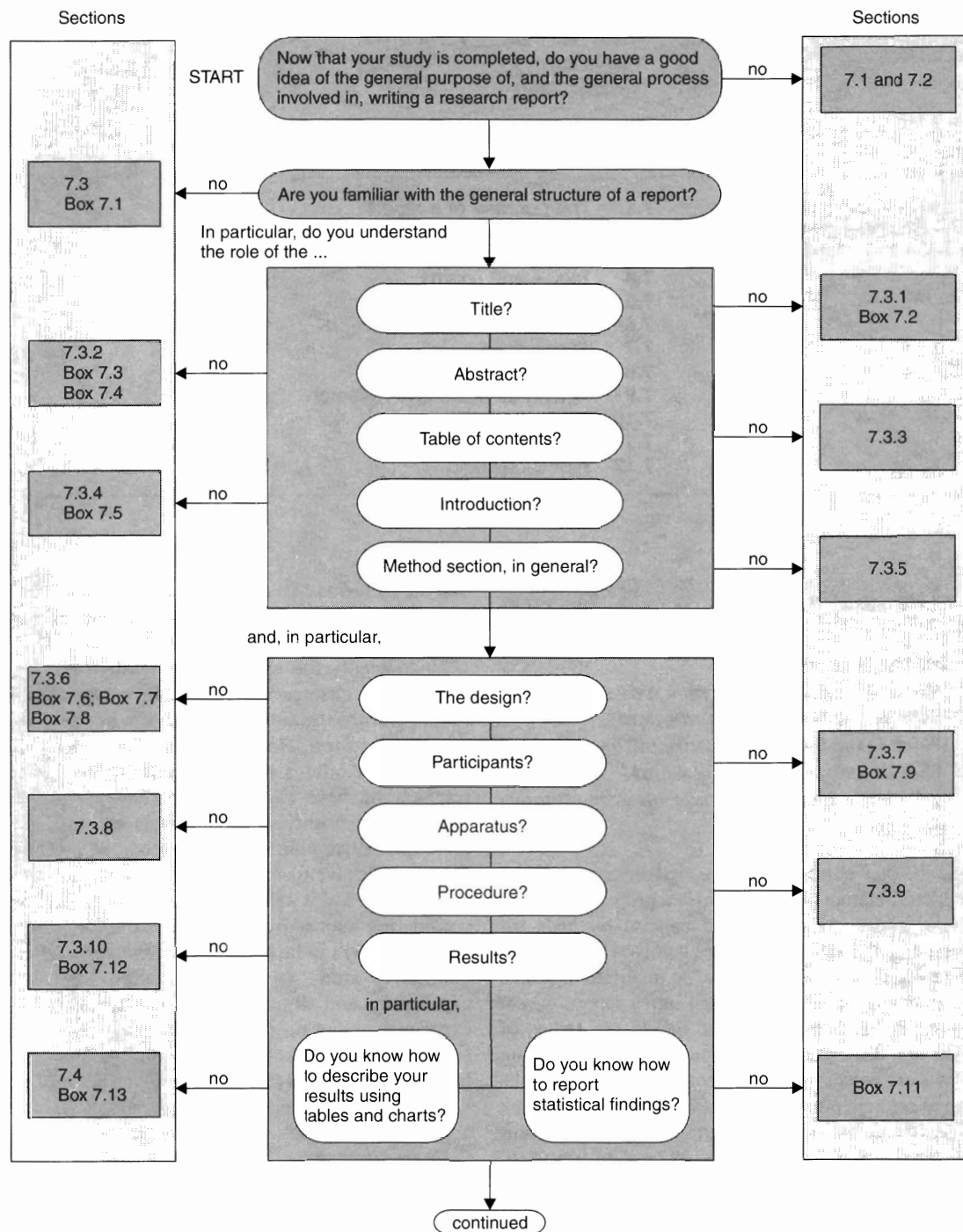
- *What's an abstract?*
- *How does a design differ from a methodology?*
- *What do I do with all this raw data?*
- *Which is the independent variable again?*
- *What do I do with all these words?*
- *Was this a qualitative study or a quantitative study?*

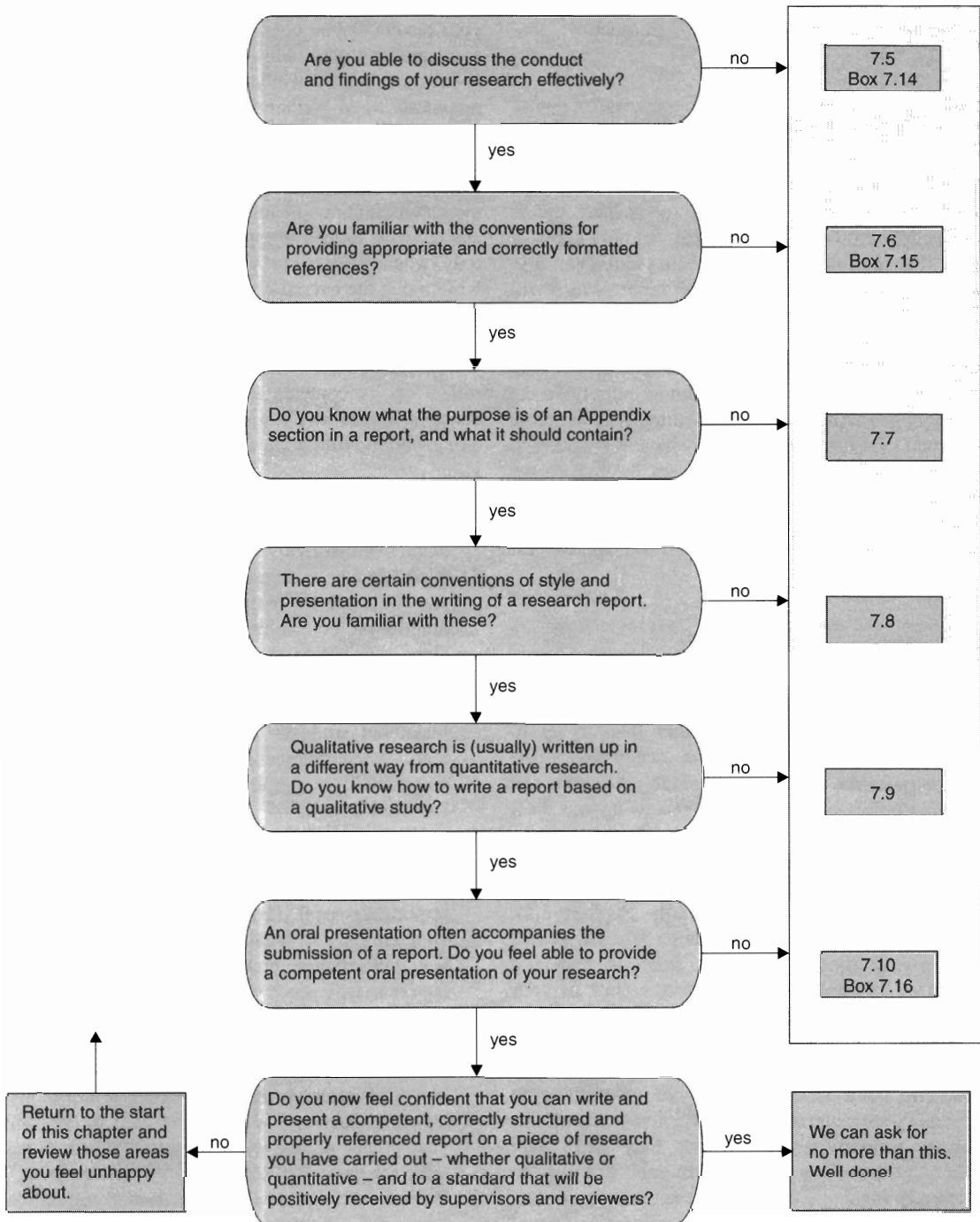
This chapter considers, in the first instance, all the important elements that comprise a proper report and offers guidance on clear and concise methods for writing up the various activities involved in any piece of research, be it quantitative or qualitative. Points covered include what should go into a report, why it should be there and where it should go. Issues of style are discussed and various ways of reporting results are considered, along with the perennial problem of referencing. For students of the social sciences everywhere, the procedures outlined here represent the final stage in a lengthy process of research. Moreover, because what is being presented is of a much more practical nature than the material covered in previous chapters, a great deal of what follows is of the *what to do/what not to do* variety. It is hoped

that the inclusion of a number of checklists will be of particular use to everyone about to write up their research.

Undoubtedly the emphasis, at least in the early part of this chapter, is on writing up quantitative research, when the aim has been to test hypotheses or support theories. However, since this book has attempted to offer a rounded introduction to social research we have endeavoured to balance what is essentially a positivistic tradition in the field with more qualitative philosophies. Indeed, the preceding chapter (Chapter 6) focused exclusively on qualitative research and it will be worth reviewing this when considering your write-up. Moreover, since many of our readers will in fact have carried out some form of qualitative study (the research may have been exploratory and descriptive in nature, rather than experimental and predictive; there may have been a small number of cases to work with; the area might have been completely novel with no tradition of previous work; or the supervisor might simply have had a preference for this approach), they will find the rigorous structure of a typical scientific report too restrictive for their type of data. There is a need therefore for guidance in writing up qualitative research, and in the latter sections of this chapter we attempt to offer what help we can.

## Exploring Chapter 7



Exploring Chapter 7 *continued*

A flowchart to direct your reading through this chapter is given here although, as with all previous chapters of this book, if the entire process of writing up a report is new to you, you might wish to start at the beginning and take each section in order.

### 7.1 The purpose of a report

You have now completed a state of the art, cutting edge, incisive and comprehensive study (or at least, this is your belief). However, other people can only know of the brilliance of this research by being told about it in some way, usually through a written report, which will offer details on what you've done, why it was done and what the outcomes were. For an undergraduate, a large proportion of marks is likely to be assigned to the final report, and success will depend almost entirely on the quality of the writing and presentation. It is therefore important to consider the way in which this work will be presented from the earliest stages through to the concluding comments. This is true whether the research was quantitative or qualitative and what follows will in large part be applicable to both approaches.

### 7.2 Writing guidelines

Ideally, a study should be written up as it progresses (it really is easier this way, rather than trying to remember what you did after the fact, which is the usual way for the majority of students). Mapping out the main points of the literature review as you do it will often serve as a guide in the formulation of hypotheses and will clarify design and methodological issues – points made right at the beginning of this book in Chapter 1 (see especially Section 1.5). Writing up the methodology section while it is still fresh in your mind will save you hours of work at a later stage, as will keeping a strict record of your references from the beginning (this goes for a bibliography as well, though note that a bibliography is quite different from a reference section; see Section 7.6). The point here is that if you are going to (or might) cite material in the body of your report, this must be properly referenced (see Box 7.15), with authors, year and journal, etc. Noting this information at an early stage will avoid frantic scrabbling through scores of journals when it comes to writing up. One of the most common mutterings overheard in university

libraries everywhere (from students and authors of textbooks alike) is, 'Where was that reference?'

Another area where it is important to keep a track of what you are doing is in the results section. Writing up your results as you conduct the analysis will identify any significant gaps while there is still sufficient time to fill them. Alternatively, this might also help you to recognise when further analysis is unnecessary – a common problem with many undergraduate reports is over-analysis of data, which creates needless work for both the student and the supervisor. However, even the most conscientious of researchers may have to make amendments to their report at the last minute, and it is only when discussions and conclusions have been written that the overall structure may be assessed (this is the reason why you should always write the abstract *last*). It is important to allow yourself the time to read your work critically before it has to be submitted, to reflect on its contents and to make any necessary changes. This is why you should make notes as you go along, and the following should serve as a guide:

- 1 File complete references of articles or books that you have read, with details of the main points of studies or theories.
- 2 Write down the arguments behind your hypotheses. It is all too easy, during the course of a lengthy project, to lose sight of what the original aims were. Being able to return to some statement of intent will serve as a reminder as to why you are doing this. This may seem an odd point to make but students often experience periods of alarm when, bogged down by scores of questionnaires, rating scales and transcripts, they feel they have lost direction.
- 3 Carefully record the means whereby you recruited participants, with details of the numbers agreeing or refusing to participate. This can become an important issue if you are hoping to generalise from your sample to a wider population – subject numbers and sampling procedures will be key limiting factors in how much you will be able to say here.
- 4 Note any changes that you may have made to questionnaires or other instruments, and the arguments behind the changes. It is important to demonstrate how your research developed and one of the elements a supervisor will be interested in concerns your choice of, for example, questionnaire items: Why ask these questions? Why in this format?
- 5 Record details of pilot studies, and any modifications made as a result of those studies. As with the previous point, it is important to show how your

research developed and how you ended up adopting a particular approach. Pilot studies often play a key role in determining the final structure and format of research; they should therefore be described in detail.

- 6 Maintain a log of the exact procedures you employed, with appropriate justification. Much of the criticism levelled at undergraduate projects revolves around procedural problems – not enough detail, no explanation of why this approach was adopted, etc.
- 7 Keep track of coding procedures. Not only will you be expected to give an account of this in your report but, from a practical point of view, it is easy to forget which particular numerical values you used to denote responses on a multi-item questionnaire. To change a coding frame in the middle of a study can be fatal.
- 8 Keep a detailed record of all analyses carried out and why you did them. Apart from the obvious necessity of being able to report this as part of your write-up, there is a risk of losing sight of what you are trying to do at this stage; wading through pages of SPSS output showing descriptive statistics, numerous *t*-tests and the odd analysis of variance can be confusing (what an understatement), not to mention a major contributor to the sense of panic that often strikes at the analysis stage of a research project. Faced with a tearful student wielding the results of umpteen correlations a supervisor will typically ask: ‘What was it you were trying to do?’

Keeping research notes like this can take many forms, although perhaps a diary or lab-book format is the simplest; keeping up with reading, meetings with supervisors and notes needs a certain amount of self discipline, and it is surprising how often one simply cannot remember such details at a later stage. You really will be saving yourself time and trouble if you keep an accurate running record of your research activities in some organised format. Relying on memory alone, or random scraps of paper, will not be effective; your supervisor will (or should) keep a diary of your progress and it is very much in your own interests to do the same.

## 7.3 The structure of a research report

The basic structure of your write-up should normally follow the familiar layout of most research reports; i.e. it should consist of the four major sections:

Introduction, Method, Results, and Discussion, in that order, headed by the title and abstract and followed by the reference list and any appendices (see Box 7.1). Part of the reason for keeping to this conventional format is that the reader will know just where to find each piece of essential information about your research. You should therefore make sure that your report conforms to this layout as much as possible, and that relevant information is where it should be.

The report on a research project is obviously likely to be more substantial than the average laboratory report. A common question from undergraduates though is ‘how long should the report be?’ The answer, however, no matter how unsatisfactory, must be: *whatever it takes to report the research concisely, but clearly, accurately and completely*. Having said this, most student researchers will probably have some sort of length indication specified by their department or tutor (e.g. ‘about 10,000 words’). This is always a rough indication, since an assessor is not actually going to count the words (big surprise, especially to those of you who like to include a word count as part of submitted work), but any such limit is worth bearing in mind and a report should always endeavour to end up somewhere within the recommended range. One of the most annoying aspects of undergraduate reports for supervisors is unnecessary length – a product of over-writing and a sense that every concept, theory or piece of previous research must be explained in great detail, especially in the introduction. In most cases this is not necessary and a general overview of established theory is sufficient, except when a particular study or issue forms the basis for the current piece of research, in which case detail is essential.

### 7.3.1 Title

This should be concise but informative, and should give a clear indication of what the project is about, e.g. ‘Invisible barriers to women’s advancement in academic institutions’, or ‘Regional differences in the perception of European stereotypes’. Readers should be able to tell, from the title alone, whether a report is of interest to them, or of relevance to their own research. A title that is too general may be at best uninformative and at worst misleading: for example, the title ‘Gender and socialisation’ gives no indication of which aspects of either gender or socialisation were investigated. If a report is likely to be placed on library access, or in other ways made available to a broader readership, it is important that the title contains the relevant keywords

**Box 7.1 The structure of a typical project report****Title**

Brief, clear, accurate; don't try to be funny or whimsical (10–12 words at most).

**Abstract**

Approximately 100–150 word summary. Say briefly what it's about, what was done, and what was found. Write this last!

**Introduction**

What was this research all about? What relevant previous work was there? What did they find? Is there a central theory, or a debate about different theories? Was the present study the same (a replication)? If not, how was it different? In either case, what were you trying to do (aims)? And what did you expect to find (the hypotheses)?

**Method**

Four sub-headings, setting out the structure of the study, as follows:

- 1 *Design*. What sort of study was it (e.g. an experiment, a survey, a case study)?  
Repeated measures design, independent groups, or a mixed design?  
What were the dependent variables (what was measured)?  
What were the independent variables (what varied across different subjects)?  
What did participants have to do?
- 2 *Participants*. How many? Any relevant description.
- 3 *Apparatus*. What materials or equipment did the study need?

- 4 *Procedure*. Briefly describe what happened. Quote the instructions given to the participants.

**Results**

A written presentation of summary results, not individual subjects' data. For example, give the mean and standard deviation for the dependent variable for each different condition. If any graphs or tables help to clarify the results, put them in here, but don't merely duplicate tabular data – figures are only useful if they clarify, or highlight, data in a manner not possible with tables. Report the statistics used, and say briefly whether the results supported the hypotheses or not.

**Discussion**

An examination of your results, comparing them with previous findings. What conclusions do they point to? How do you interpret your findings? You could also suggest improvements or variations in the design, or further hypotheses that might be tested.

**References**

Only list references actually cited earlier in the report. If it is important to mention other sources used, though not explicitly cited, these should be given in a separate bibliography.

**Appendices**

This is the location for the raw materials used in the study – stimuli, examples of questionnaire and so on. Raw data and computer print-outs are not recommended, unless there is a case for inclusion. Supervisors will normally inform you of their expectations here.

**Box 7.2 Common errors in the title**

Some authors try to apply snappy titles to their work, incorporating puns, innuendo or otherwise playing on words, presumably in the hopes of appealing to journal editors (or amusing supervisors enough to gain an extra few marks). For example:

**New treatment in substance abuse: not to be sniffed at**

or

**Freud and the unconscious?  
Dream on...**

Amusing as these may be, they don't actually offer much information about the studies and would be likely to be overlooked in the early stages of a literature review for this reason. And in case anyone is wondering, editors and supervisors would not be impressed.

that any interested readers would be likely to use in their literature search (e.g. 'regional differences', 'academic institutions', or 'European stereotypes'). This is of particular importance today when, increasingly, researchers are using the Internet and other electronic databases to carry out keyword searches.

**7.3.2 Abstract**

The abstract is a short summary of the main information contained in the project report as a whole. It should ideally be about 100 or 150 words in length. Although the abstract is positioned at the beginning of the report, it is often the last part actually to be written. It will certainly be easier to write the summary when the report is finished than the other way around. Normally the abstract should – very briefly – identify the problem studied; the hypotheses tested;

the method employed, including the number and kinds of subjects; the results obtained; and the main conclusions drawn. Statistical details should usually be excluded, unless you have used a novel type of analysis, or have departed from the norm in any other important way (e.g. used a non-standard significance level, etc.). In short, an abstract should be like an extremely condensed version of the full report, providing key information from the introduction, method, results and discussion sections.

Writing a good abstract (one that conveys key information clearly and accurately, without exceeding the length limit) is difficult, but it is important. Like

the title, the abstract may be accessed by online search systems, so it should contain enough specific information to enable a researcher to find the work in the first place, and then to decide whether to read the whole thing. This is becoming increasingly important with the advent of modern databases since the abstract (and the title) will often be the first point of contact others will have with a researcher's work. It is therefore important to get it right (see Box 7.4).

### Box 7.3 Common errors in the abstract

In the search for brevity some writers reduce the information content of an abstract to the point where it becomes impossible to judge the nature of a study without reading the entire report. This is a particularly common problem among undergraduate students, but it is not exclusive to them.

A study on consumerism among a stratified sample failed to demonstrate significant differences among any of the comparison groups on any of the 15 differentiating behaviours. In all cases the null hypotheses were accepted.

An abstract of this nature is virtually useless. There is no real indication of what the study was about, which aspects of consumerism were being studied, or who the participants were. Nor is there any indication as to what kind of statistical analysis was carried out in order to test the hypotheses – whatever they happened to be. Equally unhelpful is the two-page abstract in which the writer is incapable of summarising the important elements of the study:

In a study carried out over five days between April 1st and April 5th one hundred subjects participated in a between-groups experiment on choice behaviour, with choice being determined as a preference for vegetarian versus non-vegetarian food in a canteen environment. The participants were initially drawn from a local population comprising primarily university undergraduates, all of whom lived within the campus area, except for a small group who commuted from a neighbouring district. Of these, the population was known to comprise 80% males and 20% females, with an age distribution roughly... arghh!...

This amount of detail, if extended to the rest of the study, would provide an abstract almost as long as the report itself, which is as counter-productive as the previous, minimalist example.

### Box 7.4 Abstract: checklist

A good abstract should contain the following information:

- 1 The research issue being explored. This would comprise the research question, or the theory being investigated in the study.
- 2 The hypotheses being tested – the specific predictions that form the bases of the study.
- 3 The design of the study – the way in which it has been set up to explore the hypotheses, expressed in the language of design (e.g. repeated measures; counterbalanced).
- 4 The key characteristics of the participants, insofar as this information is relevant. There is little point, for example, in offering detail on age unless age influenced, or explained, the findings in some way.
- 5 The key characteristics of any apparatus used, again only insofar as this may be relevant – if findings can only be explained by reference to the specifics of apparatus, or if replication could not take place without this particular information.
- 6 The outcome of the study, in terms of whether or not hypotheses were accepted or rejected.
- 7 A comment on any unusual features of the study, if appropriate.

### 7.3.3 Contents

If the purpose of a write-up is a final report rather than an article intended for publication (which, alas, is something few undergraduates actually consider), a list of contents could be provided, based on section or chapter headings. This is particularly important if more than one experiment is being reported, or if a project moves forward through a number of successive stages. Also included here should be details of any appendices, and this is probably an appropriate point at which to remind you to number the pages – again, something often forgotten by keen (or late) students. A look at the contents section of this book provides a good example

of the level of detail that is useful in highlighting what is to follow, and readers can judge for themselves how useful (or otherwise) this feature is.

### 7.3.4 Introduction

This is the first major section of the report. A good introduction should provide the reader with the essential background to the project, starting out with a broad description of the particular research topic that is being dealt with, and moving on through a clear and accurate account of the previous research that has led up to the project. You should be able to show that your particular study is a natural development of this previous work, and that it adds something – even if that something is only that an effect is (or is not) replicated with a different sample. It is also important to show that you are aware of current or recent work relevant to the study, and that the important theoretical issues are understood.

There is no one correct way to begin an introduction, but it is probably a good idea to start off with a brief overview of the area of study to set the scene for what is to follow. For example, if a study concerns the relationship between occupational status and spending patterns, one could begin by describing the general assumptions made about this relationship, followed by a delineation of the aspects of social class and purchasing to be considered in further detail in the report. If a study concerns ways of coping with a particular illness, you could begin by describing the aspects of the illness that may be found stressful, followed by an outline of the model of stress and coping that you intend to use as a framework for analysis. The introductory paragraphs should therefore outline, in a general way, what the study is about and which aspects of a given issue you are exploring.

The central part of an introduction should cover the relevant research that forms a background to the project. If the research is based on one major published study, describe this in some detail, including the number and type of participants used, the design of the original study, the measures taken, and the method of analysis. This amount of detail is necessary since, in your own study, you will probably be using a similar design, with similar types of people. If the aim is to refute or criticise a previous piece of research, you will still need this level of detail, if only to demonstrate how, by using a different mode of analysis from the original, for example, you generate completely different findings. Following on from this you should

comment on the study that is serving as a platform for your own work, taking into account such issues as the adequacy of the subjects, measures, design and analysis used, the extent to which the results may be generalised to other populations, and any theoretical implications of the results. You can then describe other studies in the area using this general framework, although unless they relate directly to the research issue, or provide a further foundation for what you are going to do, these should not be presented in anything like this amount of detail. In this way, the major areas of interest, related issues and matters pertaining to the particular approach you are taking, can be clarified as you proceed. Consequently, hypotheses or research questions when they are finally offered – usually in the concluding phase of the introduction – should not come as a surprise to the reader: every aspect of the hypotheses should have been mentioned at an earlier point in the introduction and should follow on naturally and logically from what has gone before. It is a common experience of supervisors to come to the aims, objectives and hypotheses section of a report and then to have to go back through the introductory discussion to try and find out where these hypotheses came from and what their rationale might happen to be. It is worth mentioning that this can be extremely irritating for a supervisor, so consider yourselves warned.

The introduction should normally lead towards an overview of what the study will actually do (but saving the details for the next section) and should conclude with a statement of the hypotheses that the study actually tested. It is often useful to state these twice: first as a general prediction of outcomes (e.g. that certain patterns of social relationship would be associated with type of schooling – denominational versus non-denominational); and then as a precise experimental hypothesis, e.g.:

It was therefore hypothesised that significant differences in the perception of traditional marriage roles would be observed between participants from a denominational school background and those from a non-denominational school background; it was further hypothesised that this effect would be moderated by gender, with male participants demonstrating fewer differences than females.

It is also useful at this stage to identify (as much for your own benefit as the reader's) the independent and dependent variables so that it is always clear what is being tested. The more precise hypotheses can be, the more straightforward will be the conduct of the study itself. (And the more likely you will be able to recover



**Box 7.5 Common errors in the introduction**

- 1 Writing an anecdotal, subjective background that is based more on personal opinion than a sound knowledge of the field.
- 2 Trying to cover the entire history of research in the field: be selective, and review only that which is directly relevant to your own study. This is especially important in areas that have proved popular among researchers (imagine trying to review the last 50 years of research into personality and you will get the point).
- 3 Explaining too much: you may assume some theoretical knowledge on the part of your reader. You should not have to define common terms – unless, of course, you are using them in a specialised way. (It is worth considering the nature of your readership here. A report for publication in a scientific journal will not have to spell out the characteristics of various measurement scales in questionnaire design. A presentation to undergraduates, on the other hand, might require that the structure of, for example, a Likert scale, be explained.)
- 4 Explaining too little: we are not all experts in your field, so write as if for the intelligent, interested, non-specialist. In practical terms a balance will have to be struck between this and the previous point.
- 5 Failing to show how your review of the relevant literature leads up to, and provides a rationale for, your particular study.
- 6 Failing to state just what it is that your study is seeking to accomplish. A frequent form of this error is failing to state your hypotheses at the end of the introduction.

from the sense of panic common to the middle stages of a project, when there is a danger of losing sight of what it was you were trying to do.)

Pilot studies may also be mentioned in the introduction if they have contributed to the development of hypotheses or research questions. Otherwise, the convention is that details of pilot studies are given in the method section, especially where they relate to developing questionnaire items or strategies for data gathering.

### 7.3.5 Method

The method section is the next major part of a research write-up, insofar as it presents all the information about how the research was actually carried out. Its purpose is to present a detailed description of the conduct of the study in such a way that the reader can follow the natu-

ral timeline, or sequence of events, that characterised the study, from general introduction through specific hypotheses to actual testing and data gathering. This is an important section since it provides the opportunity to explain what you actually did. All that has gone before is abstract, concerned with theory and hypotheses. The method section is concerned with the concrete: Who participated? How were participants assigned to groups? What was measured? What checks were made on extraneous factors? These are typical questions posed by anyone reviewing or assessing a report and the answers should be readily available in this section, simply because of the detail offered by the researcher. From a practical point of view the method section also provides an insight to a supervisor as to how careful and systematic the student has been in the conduct of their study. This is the section in which design flaws become highlighted and the limitations of the study underlined. Often, when criticising the findings of a study, a supervisor will return to the method section with comments such as, 'you cannot make this generalisation with such a small sample', or, 'by doing it this way you overlooked an important issue'. Frightening as this revelation must be to many undergraduate readers, it nonetheless makes the point that this part of a report is central to the way in which a piece of research will be evaluated. If a study is flawed it will show up here but, if the researcher understands enough about the issues and how they were tackled, the limitations outlined here will form the basis of much of the later discussion section in which the writer will attempt to justify the conclusions drawn, demonstrate that she understands why hypotheses were not supported, and be able to outline ways in which the issues might be more effectively explored.

A second reason for providing a detailed method is that there will be occasions on which a researcher will wish to replicate a particular piece of research; perhaps the study has broken new ground in its field, or perhaps its findings are unexpected, or even suspect in some way. Or perhaps a researcher wants to know if particular effects can be reproduced under different circumstances, or by using different types of participant. Whatever the case there will be occasions on which a researcher will feel that there is reason to replicate previous work, and the only way this is possible is if there exists sufficient detail on how the original research was carried out. Now realistically, this will rarely be true of most undergraduate research. As we have previously stated, studies at this level are more often carried out for demonstration and experiential purposes than to genuinely extend our understanding of the

human condition. Yet, as part of this process, an ability to produce replicable methodology is an important skill for anyone intending to pursue their interest in society beyond the graduate level.

The following sections illustrate the major divisions that comprise a typical method and describe the ways in which this part of a report would be structured.

### 7.3.6 Design

This, the initial part of the method section, describes the formal structure of the study. It is usually brief and concise, but lacking in specific details about subjects and procedure, and it is generally couched in the technical language of a research design (between-subjects; repeated measures; counterbalanced, etc.). First, you will specify what kind of investigation has been carried out (e.g. was it an experiment, an observational study, a survey, a case study, and so on). You should then define the variables either measured or manipulated in the study, making the distinction between independent variables (or predictors) and dependent variables (or outcome measures). This ought to be a straightforward task, since these matters will have been sorted out in the early stages of a study. However, supervisors are often surprised at the confusions that appear over the description of variables present in a study, even in cases where the rest of the work is of a high standard. (If this is still a problem, a review of Chapter 2, Sections 2.4.6 and 2.4.7, will be helpful.)

This difficulty of correctly identifying variables can sometimes be aggravated in correlational studies where identification is sometimes less clear – variables are related or associated with one another but not always in an obvious cause and effect manner – but you should usually be able to distinguish between the variables that you want to find out about, and the variables that you are just using to get there (predictors). You should also specify any important extraneous variables: i.e. factors which under other circumstances might be considered independent variables in their own right, but which in this case might have to be controlled for. (Our discussion on the distinction between multiple regression and partial correlation in Chapter 5 (Section 5.6) is a useful guide to the issue of when a variable is extraneous or not.)

Another important design element is whether you have used repeated measures (within-subjects design), independent groups (between-subjects design), or a combination of the two (mixed design). (See Chapter 2, Sections 2.5.2 and 2.5.3.) This should be accurately reported, especially in experimental studies (note that

#### Box 7.6 A typical design

In a  $2 \times 3$  quasi-experimental design, male and female patients were assigned to one of three exercise conditions. The dependent variable was post-operative recovery time, measured in days to a predetermined level, and the between-groups independent variables were gender (male or female) and exercise regime (none, moderate and regular). The covariate of age was controlled for.

correlational designs by definition use repeated measures). The factor levels that combine to form the experimental conditions should be described if appropriate, as should the method by which the subjects were assigned to groups. Box 7.6 provides an example of the information expected in a typical design.

A common mistake made by undergraduates is to confuse design and procedural matters. It must be remembered that the design of a study is the plan of campaign, formulated before the study proper is implemented. Consequently when decisions are made it isn't possible to know how many participants will actually respond to your questionnaire, or whether your particular experimental manipulation will produce a revolt among one of your groups. This is why the design is a formal statement of intent, expressed in general terms and using the language of experimentation. If still in any doubt about this, the whole of Chapter 2, should be reviewed. Box 7.7 also illustrates this point.

#### Box 7.7 Common errors in the design

Many people, and especially those new to the scientific report, readily confuse procedural elements with the design. By way of example, what follows is an outline of procedural matters:

Eighty subjects were used in the study; 40 males and 40 females, of varying ages and backgrounds. Both groups were treated identically, being shown a video, prior to the experimental manipulation, in which the procedural details were explained. The manipulation itself comprised a small parts assembly exercise in which a number of rivets, washers and bolts were assembled in a predetermined order and then inserted into a pegboard. On completion of the experiment each subject completed a questionnaire which rated various attitudinal factors on a 1–5 scale...

The key point about a design is that it should serve almost as a schematic map or diagram of a study in which the major elements – and only those – are illustrated.

If your project is at the more qualitative end of the spectrum, you should still try to give a formal and objective description of your project under this heading. Thus you should clarify the method (e.g. observation, or semi-structured interview), the main issues under consideration, corresponding to dependent variables (e.g. types of non-verbal behaviours, expressed sources of stress at work), other variables or factors corresponding to independent variables and covariates (e.g. gender, age, employment status), and time factors, such as the frequency of repeated observations.

The final element in this section is shown in Box 7.8, comprising a checklist of key points that you should review before you consider any other developments in your study. It is worth remembering that if you have come up with an inappropriate design, or if you are unclear about key design elements, everything that follows will be affected.

#### Box 7.8 Design checklist

Your design should contain the following information:

- 1 The nature of the study (e.g. experimental, survey, case study, etc.).
- 2 The structure of the design (e.g. repeated measures, independent groups, etc.).
- 3 The independent and dependent variables.
- 4 Extraneous variables and any controls used to reduce their effect.

### 7.3.7 Participants

Give *relevant* details of those who participated in your research, including the number of subjects who comprised your sample, their age and gender, and on what basis they were allocated to subgroups. Any participant profile characteristics that might have affected their responses or behaviour should be mentioned, and you should explain how these were dealt with (e.g. 'to allow for any possible gender effect in response, equal numbers of male and female participants were present in each of the groups'). You should also state how the participants were obtained, and give refusal rates if appropriate. You should aim to give sufficient detail to enable you and the reader to decide the extent to which your subjects were representative of the population. For example, if you recruited participants through a self-help group or

#### Box 7.9 Participants section: an example

The subjects, all members of a university subject panel, were 60 undergraduate volunteers (30 males, 30 females), who participated in the survey voluntarily. The median age was 19 years (range 17–23). Subjects were assigned to either the frog group or the newt group on a quasi-random basis, with the constraint that equal numbers of male and female subjects were included in either group. Given the nature of the task, the subjects were screened to ensure that their eyesight was normal or corrected to normal.

through a newsletter, you may have distributed 100 questionnaires but had only 40 returns. This should be stated, since it may imply that your results are applicable only to a subsection of the target population. While this may be a limitation of your project it is not something to be hidden, or indeed to be ashamed of. In this case, the possible limitations of your results should be considered in the discussion element of your report, as mentioned in the previous section on methodology. See Box 7.9.

### 7.3.8 Apparatus (or materials)

Give full details of all equipment, apparatus and materials used. Trade names and model numbers of pieces of equipment should be given. The full names of published tests should be given, with references. Details of pilot studies may be given here, if they confirmed the utility of apparatus or materials, or, alternatively, if they indicated the need for changes or alterations. If questionnaires or other test materials have been changed in any way, give full details and a rationale for the changes made. For example, you may have changed the wording on a questionnaire item originating in the USA to make it more suitable for a UK population, or you may have omitted an item because it was unethical or irrelevant within the context of your project.

If you have used a fairly lengthy questionnaire or interview schedule, you may wish to give some representative examples of items in this section, and refer the reader to an appendix where the entire list can be found. If your questionnaire incorporates a number of different sections or subscales, make it clear what these are and how they are to be calculated. If you have written a computer programme for your study, give a careful explanation of what it actually does. The programme itself can be listed in full in an appendix.

You may have devised an interview schedule for your project. In this case, describe the main areas covered in the interview and indicate the sources of any particular questions or wording. Give the interview schedule in full in an appendix.

### 7.3.9 Procedure

Describe exactly what was done, and include verbal instructions given to subjects. If instructions were provided in handouts or with test materials, include these in an appendix. Bear in mind that the function of this section is to give the reader sufficient detail to repeat the study. (In reality we accept that rarely will anyone wish to replicate an undergraduate study, except under exceptional circumstances. The point is that, if someone wished to do so, there is sufficient detail here to allow them the opportunity.) And of course, we mustn't forget the key role of the procedure in assessment. For many supervisors, how you carried out your research is the most important element of your report.

Indicate the circumstances under which the subjects responded (e.g. in a designated room on their own, in groups, in their own homes, in the library), the order in which test items were completed (e.g. whether the order was randomised or fixed, and if fixed, what the order was), and the approximate length of time required by subjects. You should also clarify here the extent to which participants were offered anonymity, the instructions participants were given with regard to terminating their involvement in the project, any payment offered, and de-briefing or feedback procedures. You may have given some of this information in earlier sections; however, it is important to provide a full and clear description of the procedure in this section, even at the risk of repeating yourself.

The method is the second major section of the report, but is often the first to be written. The reason for this is that most of the technical details, the structure, and the practical details of the study have to be decided in advance. The method section is also the easiest to write, since you do not have to invent anything or be creative in any way: you are simply reporting factual information about your study.

### 7.3.10 Results

If you have conducted a quantitative study, this section should contain all the objective outcomes of your study: the factual results, as generated from analyses and

without any attempt at discussion, inference, or speculation. This should be presented in conventional text format, as in the rest of the report (that is, say in writing what occurred, with appropriate *t*-values, *F*-ratios or whatever). The temptation to expand and speculate here is, admittedly, huge. After all, this represents the point at which you have finally learned whether or not your predictions have been justified, hypotheses upheld or theories supported. However, the discussion section is the place to argue about the implications, not the results section. (The names given to these different parts of a report, by the way, ought to be something of a give away!) At this stage, you should present first the descriptive statistics, which summarise your data in a standard form, and second, inferential statistics, which test whether your results can be distinguished from chance and hence whether your hypotheses have been upheld. It is not usually appropriate to report individual subjects' raw data unless your study requires it, e.g. in a case study, where you may only have the one subject. Similarly, any arguments as to what your findings might imply will not be made here; this section is purely for the statement of the results of your study and nothing more. Probably the easiest way to think of this is that the reader, having read through the introduction and focused on the aims and hypotheses, will now want to find out what actually happened. Moving to the results ought to show, clearly and concisely, whether or not hypotheses were accepted, theories supported or indeed whether or not the experiment (if that's what it was) worked.

Descriptive statistics should normally consist of the means and standard deviations of your main outcome variables (which may be compared with any available published norms), and this would include not only global summary measures, but also those for any appropriate subgroups or conditions. For example, you may wish to give separate means and standard deviations for males and females, or those in different age groups. The descriptive statistics can often be conveniently presented in a table, or alternatively in a figure (see Section 7.4) if the nature of tabulated data is potentially misleading, or if there is so much of it that the information to be expressed is obscured. (It is worth noting, though, that tables and figures should be used as either—or alternatives. It is not appropriate to present the same data twice, once in each format. What would be the point?)

If you are using a questionnaire or materials that other authors have used, compare your results with theirs at this stage. Thus you should be able to demonstrate that your sample has provided data that fall within an expected range (or not), and that these data are

suitable for further statistical analysis. Both of these points may be raised in the discussion.

If your sample appears to be different from other samples in some important way (e.g. your participants have different profile characteristics, or they obtain markedly higher or lower measures on particular questionnaire items), you may still be able to carry out further analysis, but you should indicate the nature of the differences and show that the necessary steps (e.g. data transformation, re-coding) have been taken. The presentation of descriptive statistics is important, and forms the logical starting point of further analysis. Moreover, as experienced researchers and reviewers are aware, inspection of descriptive statistics is often sufficient, on its own, to determine the outcome of a quantitative study. When two mean scores, for instance, are close to one another it is often clear that no real difference exists between the groups, obviating the need for any further analysis. Indeed, many a supervisor will criticise a student for proceeding with a comprehensive and complex inferential analysis of data, when inspection of (and understanding of) the descriptive statistics would have clearly indicated that no effects were present. A useful thing for students to know! For this reason it is worth having a good look at the relatively straightforward statistics in Box 7.10 before moving on to the main analysis.

The results of the statistical analysis should then be presented in a clear and logical way. The most obvious approach is to deal with each hypothesis in turn, in the order given at the end of your introduction. The aim is to show clearly what your data say about each one, and then to state simply whether this evidence supports it or not. Generally speaking this requires you to report the appropriate significance test, giving the value of

### Box 7.10

Example:

Mean post-operative recovery time  
for males = 13.75 days  $n = 12$

Mean post-operative recovery time  
for females = 13.44 days  $n = 13$

In this example the means are so close to one another that it would seem unlikely that the groups differed in any meaningful way. Further analysis here would be pointless, unless the sample sizes were extremely large. A difference of 13.75 to 13.44 might take on a different complexion (i.e. become significant) were it maintained across thousands of patients. But not in this case.

the statistic, the degrees of freedom, and the associated probability. You should then help the reader by translating (briefly) what the test is telling you into a straightforward verbal statement, while avoiding the temptation to expand or speculate. See Box 7.11.

Always bear in mind that you must clarify your results for the reader. It is tempting to use short-hand when describing certain variables, particularly in tables. Tables derived from computer print-out usually bear the abbreviated labels used to code variables rather than the full variable name. If you do have to use shortened names in tables, provide a key underneath the table. For example:

Variable	mean	sd
Ichygrp	7.53	0.09
Squish	16.21	0.22

Ichygrp – incidence of cholesterol in the young group

Squish – number of newts run over

### Box 7.11 Reporting the results of analyses

#### 1 Correlation

A significant negative correlation was observed between cyclists' age and number of newts run over ( $r = 0.43$ ;  $df = 29$ ;  $p > 0.01$ ).

Note: this can also be expressed as  $r_{(29)} = 0.43$ ;  $p < 0.01$ . Or the exact probability can be given, as  $r = 0.43$ ;  $df = 29$ ;  $p = 0.0005$ .

#### 2 Independent t-test

A non-significant difference was observed in absenteeism rates of blue and white collar samples. ( $t(\text{equal variances}) = 1.51$ ;  $df = 22$ ;  $p > 0.05$ ).

#### 3 ANOVA

A significant main effect of fishing experience was observed on the numbers of trout landed in competition ( $F = 14.5$ ;  $df = 1$ ;  $p < 0.05$ ).

No main effect of lure was observed on the numbers of trout landed during competition ( $F = 1.77$ ;  $df = 1$ ;  $p > 0.05$ ).

A significant experience-by-lure interaction effect was observed on the numbers of trout landed during competition ( $F = 9.7$ ;  $df = 2$ ;  $p < 0.05$ ).

#### 4 Chi-square

A non-significant association was observed between participants' sex and their response to a questionnaire item (Do you support an extension to the motorway system? Yes/No) (chi-square = 2.75;  $df = 1$ ;  $p > 0.05$ ).

Note: as in example (1), all significance values can be given as the exact probabilities computed.

When you are presenting results, describe relationships as fully as possible to avoid confusion: for example, it is clearer, if more lengthy, to say 'scores on the measure of job stress were significantly correlated with scores on the "wishful thinking" coping scale' than to say 'job stress and wishful thinking were significantly correlated'.

Although the results section often contains a large amount of numerical and statistical information, it is nevertheless part of the text of your report and should be written in English. It is not acceptable simply to present a series of tables or diagrams, unless there is also a clear accompanying text which explains in plain language what your illustrations show. Even less appropriate would be to base this section on computer print-outs which are notoriously minimalist. Moreover, unless you have gone to the trouble of labelling your data, groups and subdivisions in SPSS will be presented by their numerical code. One of the most common criticisms of the results section of a write-up is that tables and graphs are unclear.

If you have lengthy or complex results, however, clarity is often greatly helped by including appropriate illustrative tables or figures. These can be a real help to the reader in understanding the overall pattern of your results, and therefore in following the argument. Sometimes, however, they can simply be confusing and counter-productive, or irrelevant and annoying. Box 7.12 provides a results checklist, which is a useful guide to what ought to be covered in this section.

#### Box 7.12 Results checklist

- 1 Have you presented descriptive statistics that represent the data fairly and adequately?
- 2 Do the results as shown deal with each hypothesis stated at the end of the introduction?
- 3 Are all the results of your analysis presented appropriately?
- 4 Are all tables and figures correctly labelled?
- 5 Is it possible to assess the outcome of the study by consulting the results alone, without the need to refer to other sections of the report?
- 6 Have you included results that are not relevant to the research issue in general or the hypotheses in particular, or to which you do not refer again?

## 7.4 Tables and figures

Tables are easily produced by a word-processor, a spreadsheet package or even by the statistics package used for analysis, and usually consist of summary numerical data (e.g. means and standard deviations, correlation coefficients, etc.), presented within a system of rows and columns representing various categories (e.g. different samples, categories within samples or experimental conditions). See Table 7.1.

Figures usually involve a more pictorial mode of presenting the data (e.g. barcharts, histograms, scatter-plots, etc.), and are either produced directly by your statistics package or indirectly by means of specialist software for diagrams and graphics. Increasingly also, many integrated word-processing/spreadsheet/drawing packages offer this facility, bringing the opportunity to create effective illustrations within everyone's grasp. Generally speaking, the data contained in tabular form are precise (actual numerical values are used) whereas figures offer a less exact though often more immediate impression. Figures 7.1 and 7.2 demonstrate the point.

All tables and figures must be numbered (e.g. *Table 1*; *Figure 1*) and should be given captions that are self-explanatory. The reader should be able to understand what a table or figure is all about without digging through the text to find out. At the same time, the information displayed in tables or figures should not be mysteriously independent of the text: it *must* be discussed, explained, or otherwise used in some relevant way. Common written comments next to tables and figures are, 'What is this?' 'What does this show?'

The whole point of using graphs, figures and tables is to report, accurately and clearly, the outcome of

*Table 7.1* Mean number of racist terms recorded in one week in six daily newspapers (with standard deviation).

	Mean no. of racist terms	SD
Paper 1	679.73	95.42
Paper 2	588.66	76.32
Paper 3	624.29	59.45
Paper 4	696.75	64.77
Paper 5	701.61	122.50
Paper 6	828.03	101.45

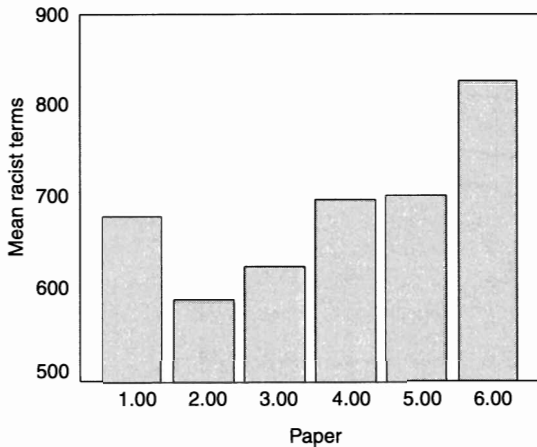


Figure 7.1 Average number of racist items recorded by six newspapers in one week.

a study. However, this section of any written report is often the main source of misleading, inaccurate and inappropriate information. Figure 7.3 shows a typical example. Here the researcher is guilty of two errors. On the one hand, there is simply too much information offered on the line graph and it becomes almost impossible to identify any trend or pattern in the data. On the other, there is no information on what each of the plotted lines is measuring: the legend for the graph is missing. Furthermore, this particular researcher seems to

have lost the ability to count, as can be observed by closer inspection of the figure in question.

In the next example, Figure 7.4 demonstrates how a sneaky researcher can manipulate the vertical and horizontal axes of a figure to maximise an effect. Presenting data in this form suggests that there are indeed huge differences between the sexes when measured on an attitudinal issue, in this instance perceptions of active discrimination against women in work.

Compare this with the final illustration in this section, Figure 7.5, in which the axes have been manipulated in a different, but equally misleading way. The data are the same as for the previous figure, but the impression created is totally different, achieved by manipulating the vertical (y) axis.

This kind of manipulation is not recommended and the sophisticated reader is likely to pick up on such attempts to deceive quite quickly. If in any doubt how best to present data fairly and objectively, most current statistical software uses a recognised format for graphs which provides an acceptable standard. If still in doubt, there is an old adage beloved of statisticians long gone now, that the vertical axis should always be  $3/4$  the length of the horizontal! Combine this with axes showing true zero points and extending just beyond the highest data value, and you have solved the problem, or at least attained consistency.

This section concludes with a checklist to serve as a reminder of what tables and figures are supposed to be doing. This is shown in Box 7.13.

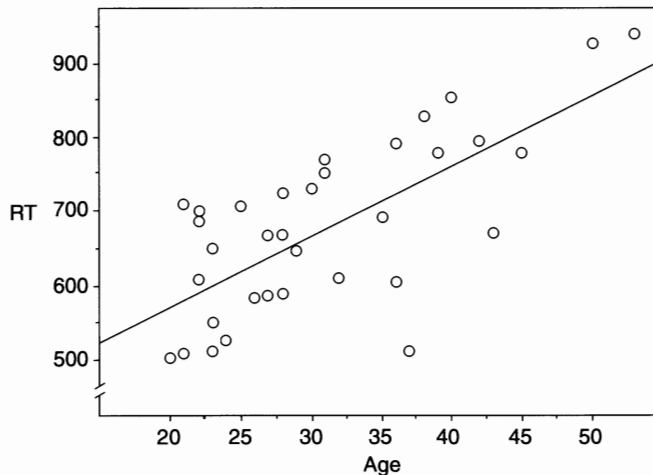


Figure 7.2 Mean response time (RT) in milliseconds to joke about frogs' legs by age.

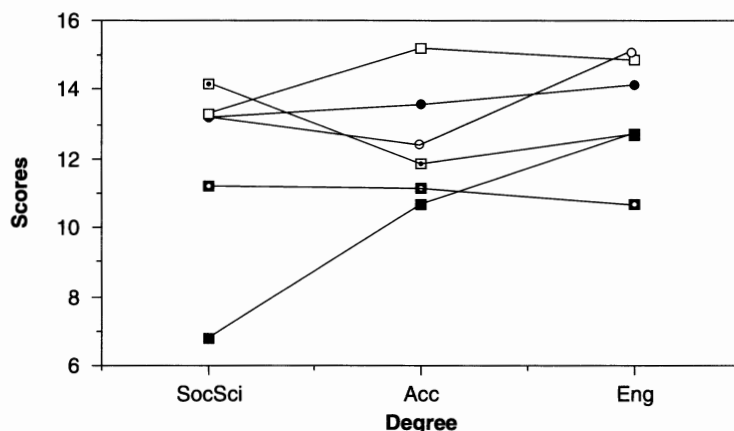


Figure 7.3 Exam performance scores in five subjects across three degrees.

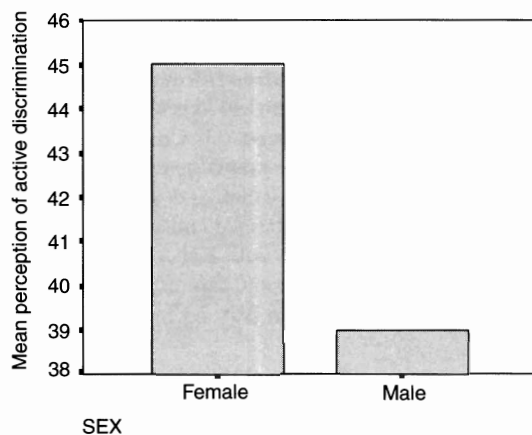


Figure 7.4 Scores on an attitude instrument for males and females. The barchart demonstrates a huge difference between the sexes.

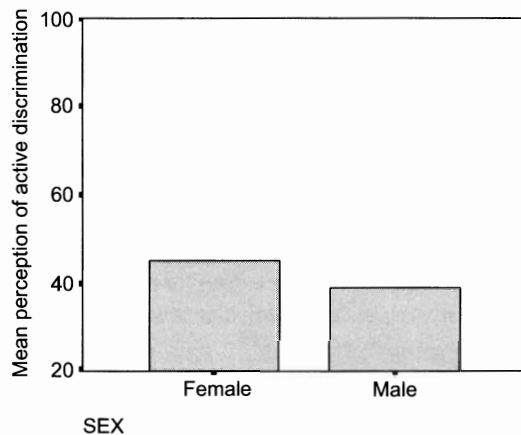


Figure 7.5 Scores on an attitude instrument for males and females. The barchart demonstrates no real difference between the sexes.

### Box 7.13 Tables and figures checklist

- 1 All data that are relevant to the study must be shown, either as a table or a figure.
- 2 All tables and figures must be clearly labelled and numbered. Axes should show the appropriate units of measurement and the variables represented on them.
- 3 Table and figure labels should state clearly what is being presented, in general terms. Specific information about the content of a figure or table can be presented in the form of column headings for a table, or the legend for a graph.
- 4 The numbering of tables and figures must be logical and sequential so they can be readily referred to in any discussion.
- 5 Duplication should be avoided – data should be presented in one format only. If a table offers a clear presentation of data, an additional figure on the same data is of little value.
- 6 Over-complexity should be avoided. If a table or figure cannot present findings in a clear and unambiguous manner, the data must be reorganised or a different mode of presentation sought.



## 7.5 Discussion

This is the section that probably demands the most from your creativity, where you try to make sense of it all, to relate your findings to previous research and explain what happened in your study – in particular this is where the hypotheses are reviewed in the light of the results. The best guidance would be to start off by restating, in straightforward and general terms, the main results of your study, and indicating the implications of these results for your hypotheses. Then you can draw on the main points of your introduction: for example, you can indicate whether your results are consistent or inconsistent with the findings of other researchers, or whether they support one theory rather than another.

You have to present some explanations for your results. This may be easy if your results are entirely in the expected direction and all of your hypotheses were supported. It may be less straightforward (although more interesting) if your results were not consistent with the results of other researchers. Under these circumstances, you have to review all of the potentially relevant points made earlier in the report: you may have used a different subject pool, used a slightly different procedure, changed the test materials in some way, and all of these may have affected your results. You should not attempt to hide any such discrepancies between your study and those of others; rather the effects of discrepancies and variations should be highlighted, since they tell you something very important about the strength or robustness of any predicted effects. Moreover, being honest and ‘up-front’ like this also indicates that you appreciate the limitations of your study, which in itself is commendable. More importantly, from an assessment point of view, if you don’t do this, your supervisor certainly will. One of the most irritating characteristics of tutors everywhere is their unerring knack of finding the flaws in the research of their students.

Overall, you should ensure that you cover all of the main points raised in your introduction. Thus if you mentioned the possibility of gender differences in the introduction, you should raise this issue again in your discussion, even if you were not able to examine gender differences (for example, because of limitations within the subject pool). One of the aims of the discussion is to highlight the limitations of your project and areas worthy of further investigation. You are not expected to conduct a study that covers every option; on the other hand, you are expected to discuss the

### Box 7.14 Discussion checklist

- 1 Have you discussed all the important issues raised in your introduction?
- 2 Have ideas crept into the discussion that are not really related to the study?
- 3 Does the discussion concentrate purely on the findings, or does it consider broader issues?
- 4 Conversely: does your discussion take sufficient note of the actual findings?
- 5 Are there any findings you have not discussed?
- 6 Have you considered whether your data might support an explanation other than the one you prefer?
- 7 Does the discussion point to original thinking?
- 8 Are your conclusions clear?

strengths, weaknesses and limitations of your work in a clear and objective tone. (Remember the point made above about supervisors.) You should also consider ways in which your project might have been improved, and the direction of any future work that may be profitably undertaken in this area.

A very important point to note is that the failure to uphold your hypotheses does not mean that the study has ‘failed’, which is often the view of students new to research. To show that something is *not* the case can be as important as showing that it *is* the case: a null result does not mean that you have nothing to say. You should not, therefore, write your discussion of a null outcome in an apologetic way; yes, we all like to get a ‘significant result’, but the rejection of a hypothesis can be equally informative, and may lead to new ideas.

The discussion should end with a paragraph or two of conclusions. It may be tempting at this stage to make rather sweeping statements. Remember the limitations of your study and try not to go beyond your own results. A useful checklist that can be applied to the discussion section appears in Box 7.14.

## 7.6 References

The references section of a report offers an alphabetical listing (by first author’s surname) of all the sources mentioned, or referred to in the main text of the report: research by others, book chapters, commentaries and quotations – any material in fact to which you have made reference in the body of a report must be cited. An important point here, and one that is a traditional source of confusion to many

undergraduates, concerns the difference between a reference section and a bibliography. References, as already mentioned, relate to work actually cited. A bibliography, on the other hand, is a listing (again alphabetically, by first author) of any work which was consulted, browsed or which in some way contributed to the background, formulation and conduct of your study. For instance, in reviewing the type of research carried out in a particular area you might have read several journal articles and book reviews, none of which provided specific material to which you referred in your report. However, insofar as they did contribute to the overall foundations of your work, they are still worth mentioning. This is the function of a bibliography – an opportunity for you to provide an overview of your own research into a topic.

The format for presenting references tends to vary slightly from publication to publication, but the majority of social science journals conform to a set of formats favoured by the major journals of sociology, economics,

psychology and politics, the essence of which we have used in offering our own guidelines, as follows.

Citations in the text itself should be by author's surname and date only, which is the minimum information needed to correctly identify the full reference where it appears at the end of the report (see Box 7.15 for examples). Any other information, such as book title, journal number and so on, is redundant here and serves only to distract. In multiple citations, reference your sources in alphabetical order. In the (relatively) rare case in which more than one article has been published by a single author in the same year, and you wish to cite all, or some of this work, such publications are distinguished using the letters a, b, c etc. after the citation: e.g. Boelen, 1992a, Boelen, 1992b. The identifiers (a, b, c) are used in the order in which you cite the work in the text, and not in the order in which they were published in the particular year in question. And of course, the identifiers accompany the full reference at the end of the report. (This last point might come as

### Box 7.15 References and citations

What follows are examples of good practice in citing the source of papers, articles and books in a research report. Editors and publishers of course will have their own preferences and many 'house styles' exist in how references should be formatted, and by and large these should be adhered to when submitting work to a professional journal or academic editor. For most purposes, though, the following will serve as a useful set of guidelines.

#### Journal articles

Boelen, W. A. M. (1992). Street corner society: Cornerville revisited. *Journal of Contemporary Ethnography*, 21, 11–51.

Seidel, J. V. & Clark, J. A. (1984). The Ethnograph: A computer program for the analysis of qualitative data. *Qualitative Sociology*, 7, 110–125.

Note that: (a) capital letters are not used in the titles of the articles except at the beginning of sections (or when proper names are used); (b) inverted commas are not used; (c) journal names are given in full; (d) journal names and volume numbers are italicised (or underlined, if you are not using a word-processor).

#### Books and chapters in books

Berkowitz, L. (1993). *Aggression: Its causes, consequences, and control*. New York: McGraw-Hill.

Williams, R. (1976). Symbolic interactionism: Fusion of theory and research. In D.C. Thorns (ed.), *New directions in sociology* (pp. 115–138). Newton Abbott: David & Charles.

Note that: (a) capitals are not used in the titles except at the beginning of sections; (b) inverted commas are not used; (c) book titles are italicised (but not chapter titles); (d) page numbers are given; (e) place of publication, then publishers, are cited last.

#### Citations in the text

In the text itself, sources are cited by surnames and date only. Citation can be direct or indirect:

- Direct: Archer (1991) found higher testosterone levels in the more aggressive group.
- Indirect: Higher testosterone levels were found in the more aggressive group (Archer, 1991).

Quotations are best avoided unless the full quotation given is of direct relevance to your own work. If you do quote verbatim from an author, give the page number as well, e.g. 'Comparisons...revealed higher testosterone levels in the more aggressive group' (Archer, 1991, p. 21). If there are two authors, give both surnames using 'and' for direct citation and '&' for indirect, e.g.

- Direct: Barry and Bateman (1992)...
- Indirect: (Barry & Bateman, 1992).

If there are more than two authors, give all the names in the References section (e.g. Johnson, Karmiloff-Smith & Patry, 1992). In the text, use '*et al.*' (e.g. Johnson *et al.*, 1992).

something of a surprise to some students who, in reproducing references from other sources, include the alphabetic identifiers without knowing why.)

## 7.7 Appendices

These should include the details of statistical calculation, and all test materials and examples of any stimuli used in the study. Note that most tutors and examiners will not welcome reams of computer output, even in an appendix, and raw data are certainly not welcomed (although there is an understanding that they could be made available for inspection should it be required). If your study is qualitative in nature, however, you may wish to include interview transcripts, etc. Again, if in doubt, you need merely consult the typical format used in a standard journal (or ask your supervisor).

## 7.8 Presentation and style

Remember that presentation is important. Try to ensure that your work is free from spelling and grammatical errors. Check your work for errors before you hand it in. The style of writing should be plain and relatively formal, and you should use the past tense throughout and write in the third person; many novice researchers frequently use 'I' and 'we' in their writing ('we felt repeated measures were more appropriate'), but this tends to create an impression of informality and lack of scientific rigour. And, whether accurate or not, impressions do count. It is much better to place some distance between yourself and the report, as in: 'It was found that/observed/noted' (except for a qualitative report in which the views of the author may be central).

## 7.9 Writing up qualitative research

*Research is research and its presentation ought to follow a standard set of guidelines and procedures.*

### 7.9.1 The background to a qualitative report

If your research conforms to the quantitative tradition then this statement will be essentially true. Many years of debate and refinement have led to a convergence of

style and structure that now characterises the majority of hypothesis-based work, as most of the preceding sections illustrate. For qualitative research, however, our statement could not be further from the truth, and for a number of reasons.

First, the aims of qualitative research are not necessarily the same as those of quantitative research. We have made this point before, during our discussions on different research approaches in Chapter 3, and more fully in Chapter 6, but it is an important point and will not suffer from repetition. Most of what we call quantitative research is concerned with hypothesis and theory testing, and prediction, and while this is possibly an oversimplification (exploratory work that aims to understand and describe can still be quantitative) it generally holds true.

Qualitative research on the other hand is more likely to emphasise the descriptive and understanding elements of research (though, confusingly, it can readily be applied to the testing of hypotheses in certain situations). In grounded theory research, for instance, the researcher is unlikely to have posed any hypotheses at all until after much of the research and data collection has been completed – which is, in fact, the point of this approach. Likewise, ethnography and the anthropological tradition aim to describe cultures, groups and societies with which the researcher might be unfamiliar. It follows then that research of this type cannot be theory-driven. And finally, to emphasise the point, phenomenological research (which aims to understand the perceptions and experiences of others from their point of view) will not be valid unless the researchers can effectively put aside their own views, beliefs, experiences or theories.

A second explanation for the fact that qualitative research does not fit comfortably into the structural model of the quantitative approach is that there are various techniques and traditions. There is, of course, more than one set of techniques appropriate for quantitative studies. We know that surveys, correlational research and experimentation reflect different traditions, but they are unified in their broad goals, the modes of analysis used to treat data and the procedures for presenting findings. The different traditions in qualitative research, on the other hand, far from converging on an agreed set of procedures, have tended to develop distinct approaches to the conduct, analysis and presentation of research. To argue then that all qualitative research can be presented (let alone carried out) according to one particular set of principles would fail to do justice to the distinctiveness of the different approaches and succeed only in raising

the ire of just about every researcher in the field. This is not to say that it hasn't been attempted. In a recent paper by Elliot, Fischer and Rennie (1999) a number of guidelines were proposed for the publication of qualitative research in the field of psychology.

Elliott *et al.* (1999) would be the first to admit that their guidelines comprise only a list of tentative suggestions about what would make good practice in dealing with qualitative studies. Moreover – in what could well be a pre-emptive strike against the army of critics waiting to retaliate – the authors freely accept that these guidelines cannot possibly be applied to all qualitative research, and they would certainly be unhappy at the prospect of imposing a constraining structure on what is a diverse and continually evolving field. However, we recognise the need to confront the issue of presenting the findings of qualitative research. Increasingly, qualitative method is appearing as an important component of undergraduate programmes and it is important that we, as tutors, advisors and supervisors, offer practical advice on dealing with the end product of their work – the write-up. This is where we, the authors, stick our necks out; what follows is a general set of suggestions for writing up qualitative research. We impose the same caveat as other authors, namely that our advice will not be appropriate in every situation, but at a general level it should provide a useful starting point.

### 7.9.2 Guidelines on writing up qualitative research

The report on a qualitative study will normally take the form of a narrative or a story, typically comprising four parts: introduction, method, results/discussion and conclusion.

#### Introduction

This would cover the following aspects:

- *The background to the study*, including any theoretical issues that are to be explored. A rationale for the study must be offered since the reader will want to know what prompted the research, what it was hoped to learn and what the implications might be in terms of, for example, changes in social policy.
- *The context of the study*. It is important to inform the reader of any and all factors that might influence the perceptions and experiences of participants, the researcher's view of events and a subsequent reader's interpretation of the stated research findings. This would include – where relevant – the political climate at the time of the study, economic factors, geographic location, the nature of the participants themselves and their history, and the social and cultural forces that may have influenced events. By way of example, if we were exploring the problems experienced by refugees from the former Yugoslav republic (FYR) attempting to adapt to our own society, we would need to understand a great deal about the culture they left behind, the political structure, and their role within that society. We would have to offer details on the political system they were entering, the social structures and divisions with which they were attempting to merge, and the attitudinal and value systems with which they would be confronted. All of this would have to be made available to the reader or reviewer to facilitate a judgement on the relevance of the work.
- *The perceptions of the researcher*. One of the salient issues in the qualitative/quantitative debate concerns the role of the researcher. Traditional positivism requires that the researcher disassociates himself from the object of research, lest his perception of reality become contaminated by his own views and experience. Other researchers, especially those in the qualitative tradition, would argue that this is impossible – we perceive the social world in terms of who we are and where we come from. Hence, insofar as our interpretation of events or our understanding of others' experiences may be coloured by our own nature, we must make clear those factors that might bias our perceptions of events, and what we did to overcome such bias. For instance, if our research concerned the experiences of black, working-class women, it would be of considerable enlightenment to our readership to learn that we were white, middle-class males with no experience of our participants. Of particular interest would be the steps we took to make it possible for us to approach such a group with any hope of understanding their lives, their hopes and their fears.
- *The nature of the research*. There are many ways of exploring our social world, most of which are an outcome of the compromise between objectives, participants and practical considerations. If our aim is to come up with some kind of hypothesis about a particular set of beliefs or about how experiences are formed out of particular social and political policies, we might adopt a grounded theory approach; if we are trying to walk in other people's shoes our approach would be phenomenological (they are not mutually exclusive, by the way). If we

have access to only a handful of people who share a particular experience our preference might be for a case study approach, where other scenarios might lead us into participant observation, and so on.

## Method

This is the major part of the report in which the researcher details what was actually done, how it was done, what changes were made and how the research evolved. It will cover the following points: what was done, how interview schedules were developed, how decisions were made on what was to be observed, how the researcher was accepted into the group, how data were collected and recorded, how the form and content of questions changed, why the issues changed, how a theory evolved, how the researcher adapted, changed viewpoints and modified her approach, what the researcher did to ensure that what seemed to be occurring was a true representation of the reality. Importantly, the issues concerning the approach taken must be considered in detail, demonstrating a clear understanding of any assumptions that were taken on board. All of this must be accompanied by substantiating and illustrative examples. It would not be enough to say, 'we felt participants were uncomfortable with the format of the original interviews and therefore modified our questioning', unless we were able to demonstrate that what we felt actually reflected our participants' real feelings. This brings us back to an issue we raised right at the beginning of this book, whereby all research can ultimately be evaluated in terms of the question, *How do you know?* How do you know your participants were uncomfortable? Do you have transcripts of conversations? Do you have journal entries? Do you have issues raised during group discussions? Have you sought the advice of colleagues? Have you confronted your participants with your view of events? Finally, have you explained what you have done in such a way that the reader can not only follow your progress but make a judgement about how well you have carried out your study? If, at the end of the day, a reviewer is obliged to say, 'I can't judge because I don't know...' then you have not written this section well enough.

## Results/discussion

This is likely to be the most substantial section of your report. Generally, you will want to present your results

and your interpretation of those results in tandem. The most important point to bear in mind is that your reader should be able to understand what you found and what you made of it. You might start out by saying how you went about the analysis – whether you took a chronological approach, for example, and how you developed themes. You will probably find it easier to present your results under various headings, and themes are useful here. For each section of your results, you must provide good evidence to support your interpretation – quotes, for example. Remember to include 'outliers' – participants who, for one reason or another, had a different story to tell. Above all, try to be honest and clear when you talk about your interpretation.

## Conclusion

Here you review your study both in terms of its conduct and its findings, in the following terms:

- *A restatement of the aims of the study.* Why you did the study.
- *A review of the procedure.* Why you chose this method, how it evolved, what the limitations were.
- *A review of the findings* and your interpretation of the findings.
- The steps you have taken to ensure the *validity* of your interpretations.
- *How the findings relate* to the issues that prompted the research in the first place.
- What, if any, *theoretical issues* developed from your research.
- The *implications* for your research.

In all of the above the key question, *how do you know?*, is especially pertinent. How do you know your participants felt this, how do you know these are the implications, how do you know these were the problems? In fact, when it comes down to it, the best advice we can offer on writing up qualitative research is, when you make a point, interpret an event or propose a finding, always ask yourself, *how do you know?* Equally important, when the time comes for someone else to review your work, how will *they* know?

This ends our brief review of qualitative writing. We recognise that many researchers will take exception to what we have said but, in such a fluid environment, this has to be considered something of an occupational hazard. We are happy enough to have offered at least a number of pointers to writing up qualitative research which, while providing some structure for

undergraduate research, are hopefully also general enough to allow for the diversity of tradition and method that characterises the field. At the end of the day what you, the student, ultimately write has to be based on a compromise among a number of significant elements, some philosophical, some practical and some personal. And, most important of all, we must not forget the role of the supervisor. For an undergraduate to embark on a qualitative project without the advice and support of a tutor experienced in the field is to court disaster.

## 7.10 Presenting a report

### 7.10.1 Oral presentation

There is an increasingly common expectation – if not a requirement – that undergraduates offer an oral presentation of their work to staff and fellow students at some stage during the conduct of a project. Timings vary, with some colleges and universities scheduling presentations at some point before data collection begins, while others wait until the entire project is completed. Either way, presentations are now a familiar part of undergraduate life and they serve a variety of functions. At the most obvious level they provide the student with an opportunity to show off, as it were. After all, a great deal of reading has probably gone into the development of a research project, only a fraction of which is ultimately used in the study proper. How satisfying to be able to demonstrate to your tutors that you have actually put considerable effort into your work (especially useful in those cases where presentations comprise an assessable component of a research methods module). Presentations also demonstrate the depth of your familiarity with a topic and tutors will often ask probing questions about issues which, even if they did not form a part of your study, you might be expected to know something about if your reading really was comprehensive.

If presentations occur at an intermediate stage then they serve the extremely useful function of generating constructive feedback, with an audience being given the chance to offer advice ('you need a larger sample for this type of analysis', or 'have you read...?'). And of course, finally, having to prepare and give a presentation can now be regarded as an important element of general research methods training. Anyone hoping to pursue a career in the field will find that giving conference presentations and research papers is a major method of contemporary information dissemination.

Consequently, a few guidelines on presentation techniques might come in useful.

A good starting point for looking at presentations is to consider their purpose. The aim of a presentation is to describe, in the course of a 10 minute talk (sometimes longer), the study that you have carried out. During the presentation you must identify the research issue you have explored, outline the research background to the issue and provide a rationale for what you have done. The actual study must be described in sufficient detail that an audience can follow your design and procedure, and results should be offered in a format that describes the outcome without confusion. Finally, you should be able to present your view of the implications of the study, and all in a manner that is interesting, informative and accurate. All in all, a pretty terrifying prospect!

In structure a presentation should be like a trimmed-down version of a standard research report, comprising more or less the same major sections and subdivisions. It will have a title, much like the report title, followed by a brief statement of what the study was about. This is not quite like an abstract since data and findings would not be offered at this stage, but more like an expanded explanation of the title, highlighting the general research area and stating the hypotheses that were being tested ('an observational study in the area of... and exploring the specific issue of...').

A review of the background to the research is important, and this will take the form of a summarised version of the literature review found in the written report. Naturally, key studies would have to be mentioned, with their findings, along with any research that provides a rationale for the study, ending with a statement of the hypotheses to be explored.

An outline of the procedure followed would be offered next, with illustrations provided of questionnaires or stimuli. Data should be described in descriptive terms, followed by precise details of results. While most of the other sections would tend to be presented in general terms, this results section should be full and precise. It remains only to make concluding comments about the conduct of the study, how the findings relate to the research issue in general and the hypotheses in particular.

### 7.10.2 Practicalities: giving a presentation

The previous section outlined the content of a typical presentation, but said little about how this material

might be presented. This section attempts to offer some practical advice.

A key point to remember, when preparing for a presentation, is that an oral exposition of a piece of work differs from a text version. In the write-up you have ample opportunity to explain in detail the conduct of previous research in your field, to include the results of complex statistical analyses and to discuss your findings at length. In a presentation this is not possible to anything like the same extent. For one thing, there are time constraints in a presentation and, contrary to popular undergraduate belief, 10 minutes is not really that long; what you say has to be a much condensed version of your study, but one that nevertheless contains the essence of what you did. For another, while a reviewer or assessor can re-read the contents of a report, or follow up material in appendices, a presentation is a 'one shot' affair. You have a single opportunity to say what you want, to make your points and show that you have done a good job. So how do you do this?

The starting point is your written report. If this is completed before presentations are given (as is the norm) then you already have all the information necessary for an oral version. You actually have too much information, so the report should be read carefully and important information extracted. Box 7.16 offers a summary of what is required.

The next stage is to decide how best to present the information gleaned from the full report. Some undergraduates will simply write a summary, based on their notes, and the presentation comprises a rather tedious reading aloud of this summary. This is not a particularly effective method of giving a presentation. It tends to be dull, it doesn't allow the audience to focus on key elements and it can also be intimidating for the speaker; with no other source of stimulation the audience's entire attention is focused on the oral presentation itself.

A far better solution is to make use of some form of visual aid. Overheads, slides and computer-generated screen graphics are all ideal and most departments will happily make facilities available for students. The advantages of this approach are considerable:

- 1 The key points of a study can be put on an overhead or slide allowing you to emphasise to your audience what the important elements of the study were. For instance, you might display the hypotheses being tested as you explain procedural matters, making it easier for your audience to appreciate why you carried out your study *this* way, as opposed to *that* way.
- 2 Complex information can be presented more effectively in this format than by verbal explanation. Just imagine trying to explain the results of a multiple group comparison analysis verbally. A table or a graph projected onto a screen will describe at a glance what might take you several minutes to explain.
- 3 A series of overheads tends to impose its own structure on a presentation, covering, as they usually do, the logical sequence of activities that comprised the study (e.g. you will probably have, in order, overheads displaying the title of the study, examples of previous work, statement of hypotheses, procedural matters, results, etc.). They also serve as *aides-mémoire*, reminders of what you need to talk about next, or which part of your notes to consult. Relying totally on notes, without this kind of external structure, can lead to confusion and loss of place, especially if the notes are extensive.
- 4 Using visual displays takes pressure off the presenter, especially useful for the nervous undergraduate who can panic quite freely in a corner while everyone's attention is focused on a projected image somewhere else.

Clearly there are advantages in using presentation aids of this type, but there are certain cautions that should be made. First, the temptation to cover your slides with everything you want to say should be avoided at all costs. The purpose of these aids is to present key points and illustrations. Any more than this and it would be as easy to provide each audience member with a text version of your talk. Legibility is another issue. If you've never used overheads before it's important to find out how big writing or font sizes need to be so an audience can read them. And third, organisation is important. There is nothing guaranteed better to destroy a nervous presenter's confidence than to discover their slides are in the wrong order, or that one is missing. Take it from two lecturers who know.

Material in support of overheads has to be considered. Previously it has been suggested that a slide can act as an *aide-mémoire*, triggering recall in the mind of the presenter and reminding them what to say next. In fact, only skilled presenters and lecturers are likely to be able to do this well and, unless a talk is well rehearsed, students are advised to use notes to accompany each overhead. Even experienced lecturers are often caught out by an overhead whose existence, never mind content, comes as a complete surprise to them, recognisable when a staff member is caught staring blankly at a screen, for some time.



**Box 7.16 Talking it through**

The following is a suggested listing – with comments – of the major elements that should comprise an oral presentation. They appear in the typical order in which they would be introduced to an audience. They also represent the likely content of a series of slides or overheads which would be used as a basis for a presentation.

- 1 *A title for the presentation*, which will be based on the title of the study itself. Accompanying notes would expand on this title, identifying the research area in which your study was based, and outlining the research questions posed.
- 2 *An outline of key research in the area*. An overhead would display the authors of research, the date of the published work and the research findings. These might be in terms of mean scores for different groups, or a description of factors identified in the research (e.g. Cattell (1969): 16 personality factors identified, viz....). Accompanying notes would expand on the studies cited, explaining the findings in more detail and demonstrating how they formed a basis for your work.
- 3 *A statement of the aim of the study*, in general terms, and statements of the hypotheses being tested. Notes would expand on the aim, reminding the audience of how the stated aim has developed from previous research (or whatever), and each hypothesis would be explained in turn – what the basis for each hypothesised prediction was, and what the expected outcomes were.
- 4 *A description of procedural elements*, such as the sample characteristics (where relevant to the conduct and findings of the study), details of any apparatus used, including questionnaires and standardised test instruments. In the case of tests or questionnaires, examples of items, coding and scoring systems can be displayed. Full copies might also be distributed among the audience.

Notes here would provide descriptive details of how samples were drawn, why certain characteristics were controlled for (e.g. extraneous variables) and how subjects were assigned to groups, if appropriate, and whether or not the design was within- or between-

groups. Details would also be given on questionnaires, including pilot study data if appropriate. An explanation of the development of items would be given and the role and composition of sub-scales discussed.

(Note: a lot of information is covered in this section and this might be represented in several overheads – e.g. one might deal with subject characteristics, there might be two or more giving examples of test items and there might be an additional slide reviewing the findings of a pilot study.)

- 5 *A summary statement identifying independent and dependent variables and noting any extraneous factors*. Notes would briefly review the procedure, reminding how independent variables were manipulated and explaining how outcome measures were taken.
- 6 *Presentation of results*. Key findings would be illustrated, first in the form of summary statistics, and then in terms of analysis. These would include means, *t*-values, *F*-ratios and correlation coefficients, for example. Probability values would also be shown.

Notes would indicate how the statistics were derived and what tests were carried out and any significant effects highlighted.

- 7 *More results*. If additional analysis was carried out to further explore a finding, or you wish to highlight some unusual or worthy finding, this should be presented next. Graphs of various types are useful here.

Notes would explain why additional analysis was necessary (e.g. 'it was noted that mean scores for males in the sample were higher than previous reported norms'), and any figures would be discussed.

- 8 *Hypotheses would be restated and upheld or rejected in light of the results*. Notes would expand upon the relationship between the findings and the predicted outcomes. Explanation would then extend to reconsidering the entire research issue in view of the study just outlined. The presentation at this point is likely to return to the kind of general discussion of issues introduced at the very beginning.

Examples of test materials can also be made available to an audience, especially if a questionnaire has been custom-designed for a study. Even copies of standardised tests might be distributed if an audience comprises largely fellow students who might not be familiar with specialised instruments.

To conclude this section on presentations, it is worth noting that giving a presentation is a skilled activity, and therefore requires practice to develop. Few undergraduates are going to be superb at this

task but, with a bit of organisation and a lot of preparation, presentations can be made competent and interesting.

**7.11 Review**

Any study, no matter how elaborate and irrespective of its contribution to the fount of human knowledge,



### Box 7.17 Some typical assessment criteria for project reports

#### **Originality**

To what extent is the choice of research area, and the general orientation of the study your own? Does the work show some originality in design or approach?

#### **Initiative**

Have you shown initiative in collecting data or in preparing test materials?

#### **Introduction**

How well have the research issues been identified and explained? Is the review of the literature relevant and thorough? Has the scope of the project been clearly presented? Are the hypotheses unambiguously stated, and is it clear how they relate to previous work?

#### **Design**

Is the design of the project appropriate for the research question? Have issues concerning sampling and control been addressed? Have independent and dependent variables been correctly identified? Has this section been expressed in the appropriate language of design?

#### **Participants**

Were the participants representative of the population? Have their relevant characteristics been described? Are recruitment strategies presented? Are response and refusal rates recorded?

#### **Apparatus/materials**

Have the details of apparatus been recorded in detail? Have the details of questionnaires, etc., been presented? Are justifications provided for the choice of materials,

and for any changes made to published materials? What data result from these measures?

#### **Procedure**

Is it possible to understand exactly what procedures were followed in collecting data? Are these procedures appropriate? Could the study be replicated on the information provided?

#### **Results**

Are the results clearly presented? Is the analysis appropriate for the level of data? Does the analysis actually address the hypotheses or research questions under test?

#### **Discussion**

Are the results discussed with reference to the issues raised in the Introduction? Are the results discussed with reference to previous findings and relevant theory? Are any problems or limitations of the study fully understood and discussed?

#### **References**

Are all references given in full? Are they presented in a standard format?

#### **Presentation**

Is the project well presented? Is it free from spelling errors? Is it well written? Are arguments clearly and carefully presented?

(Note: the sections on Initiative and Originality, while relevant for any piece of research, are likely to be particular issues for undergraduate studies.)

will ultimately be judged on the written exposition of the background, design, conduct and findings of the research. This is true whether the report is based on an undergraduate project, represents a submission to a periodical editor or is a published article in an international journal. In every case, a reader, tutor or reviewer is looking for the same kind of thing – evidence that the study has been well carried out, the data competently analysed and the research issue fully explored. A judgement here can only be based on the written report or article and, while your own research might not necessarily set the world of academia alight, if you have followed all the guidelines in this chapter, you will at least guarantee yourself a fair and objective hearing. Box 7.17 is the concluding illustration in this chapter and it offers a summary of the main points a reviewer or tutor will be looking for in a written report. It will be in the interests of all readers to study this summary carefully!

It only remains to offer once again the advice that, if anyone is still unclear about any element of report writing, the flowchart at the beginning of this chapter should guide them to the appropriate section. We wish you luck.

## 7.12 Further reading

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