

Starting Research^a

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^aThis guide arose from a number of lectures given over recent years to Honours and Graduate students in Economics at the University of Melbourne. I have benefited from comments on earlier drafts by Denis O'Brien and Sheila Rimmer.

1 Introduction

This paper provides a brief guide for students undertaking their first piece of research.¹ The activity of research itself and the closely related process of writing a research report or thesis are so different from the standard work of students, that it is helpful to set down explicitly some of those things that experienced researchers often take for granted. It might be useful to refer to this document at regular intervals during the production of your research paper.

In writing the research report, paper, or thesis the major objective, which cannot be overstated, is the achievement of clarity. You need to produce a transparent statement of the issues, methods and results. This is in fact much more difficult than is usually realised. There is no substitute for a careful study of the writing styles of exemplary authors. A willingness to respond to constructive criticisms and suggestions is also essential. You need to develop a new style of writing which is entirely different from the one used to write undergraduate essays. This paper aims only to provide some brief practical suggestions for organising the writing and giving a research paper the appropriate 'shape' or appearance: it must look like a serious piece of research.²

The nature of the research process and a brief description of the main properties of a research paper are provided in section 2. Suggestions for arriving at a research topic and making a start on research are made in section 3, which stresses the importance of the plan. General features of the research report are described in section 4. A research paper must satisfy certain fundamental scholarly requirements; these properties are explained in section 4, which also pro-

¹This is not a scholarly paper, so I have taken the liberty of not following all the instructions given here.

²There are numerous books devoted to thesis writing, and it would be useful to consult some of these. Examples include: Anderson, J. and Poole, M. (1994) *Thesis and Assignment Writing* (Brisbane: J. Wiley) and Taylor, G. (1989) *The Student's Writing Guide for the Arts and Social Sciences* (Cambridge: CUP). The following short guide to clear writing is still well worth reading today: Gowers, E. (1948) *Plain Words: A Guide to the Use of English* (London: HMSO).

vides some suggestions regarding the basic layout and appearance of the report and some comments regarding literature reviews. Some suggestions regarding the writing process are given in 5, with recommendations regarding features to avoid. Section 6 provides some checklists, and a brief summary is in section 7.

2 The Nature of Research

The major difference between research and coursework is that it is the responsibility of the researcher to identify a question; you must specify the question to be examined and decide on the approach to be used. The need to say something new necessarily involves a movement into unknown territory; there is no easy way to check if the answers are right or if the right method of attack is being used. Research therefore involves not only the continual exercise of judgement, but also a degree of confidence. In addition, there is no way to avoid occasionally following false leads and reaching an impasse, that is, going down 'dead ends'.

These aspects combine to ensure that the work should be more interesting and rewarding than ordinary coursework, while it also gives rise to alternating phases of optimism and pessimism. Additionally, it is necessary to convince others that it has been worthwhile. There are times when all researchers feel overwhelmed by difficulties, and are confused, anxious and not at all sure that they have anything worth reporting. At other times progress can seem unusually rapid, often helped by what can only be described as the substantial role played by serendipity, the faculty of making happy discoveries by accident. However, remember that 'fortune favours the prepared mind'. Experienced researchers simply know that they will go through these phases. For those who are carrying out research for the first time, it is worth anticipating these features and understanding that their experience is not unique.

Perhaps the most important rule of research is the following: there is no simple relationship between inputs of time and outputs of useful results. All research meets difficulties. Overcoming them may take a few minutes or it may take days or weeks. Successful research requires a willingness to do whatever is needed in

order to overcome the problem, however unimportant it may seem at the time. Associated with this rule is the recognition that everything takes longer than anticipated.

Research also involves intense concentration over long periods. It is not possible to return to a research project casually at irregular intervals or just when there are no other pressing commitments. It is necessary to allocate regular times to research and always to keep a project moving forward. Indeed, concentration has to be such that it becomes something that is extremely hard to stop thinking about.

A simplistic view of research may be described in terms of a linear model in which the first stage involves reading as much as possible on a chosen topic and, after having a brilliant idea of how to proceed, this is followed by the analysis. The process is completed by simply writing up the results. However, progress in research is actually highly nonlinear. It involves a complex process described in terms of a repeated cycle of writing and returning to further analyses and reading.

Writing is itself a process of discovery, not least of the author's own level of understanding. It reveals gaps in the argument and suggests new avenues of research as well as, importantly, providing an error-trapping process. Most good research, however narrowly defined it may appear initially, has its own momentum. That is, the process of researching a particular topic leads to further questions and issues. The completion of a research paper is therefore often accompanied by negative feelings that, after all, not much has been achieved. It is worth remembering that this is simply an aspect of the general truth that the more we learn, the more conscious we are of our ignorance. Furthermore, progress is in fact largely achieved by making a series of small steps, rather than taking giant leaps.

2.1 The Research Paper

It is not easy to summarise briefly the characteristics of a good research paper. However, any research paper or thesis must at least satisfy the following

requirements.

1. Demonstrate a clear perception of the research problem, its relation to the 'bigger picture' and the relevant literature.
2. Provide motivation for the research question and the approach used.
3. Demonstrate an ability to formulate a useful approach and show good judgement in selecting techniques and, where relevant, data.
4. Show an appreciation of the value and limitations of the results.
5. Indicate the potential for further developments.

3 Getting Started

Getting started is usually a hard and worrying part of research for newcomers. You can often benefit from discussions with other people. However, the research topic is your choice, so do something that you find interesting. Do not worry about what other students or friends think of your topic, though you will want to take advice from experienced researchers who are familiar with the area and its potential problems. The fact that you set the agenda is an important positive feature of research, but at the same time it presents an unfamiliar challenge. This is your first research exercise, so your major concern is initially the question of how to settle on a topic. It is important to begin with a well-defined question that is not too broad in scope. Think in terms of taking a number of small steps.

3.1 Finding a Research Topic

The following suggestions are designed to make your process of arriving at a precise topic reasonably systematic. Remember, however, that this process may take a long time.

1. Consider an area of economics that, from previous studies, you find interesting. This may, for example, be labour economics, monetary economics,

public finance, or international economics. Identify the types of issue that attract you most.

2. The next stage takes place in a library. Go to the journals section of the library and look through the contents pages of key journals in the chosen area. From there, identify papers to look at. You should also look at the general journals. There is no substitute for getting your hands dirty in this way. At this early stage, do not simply undertake computer searches based on keywords.
3. When reading journal articles or other research papers, keep the following points in mind.

² Journal papers are usually terse. They represent work which has matured over several years. Hence, a full understanding of the methods and the significance of the results can only be obtained after detailed and extensive study. This involves re-reading them several times. Investigate whether an earlier version, in the form of a departmental Discussion Paper, is available. This can often provide more details.

² However, a quick initial read will generally be enough to allow you to identify (i) the main question considered by the author, (ii) the methods of analysis used, (iii) the data required and (iv) the nature of the results. These are the four major features that should receive your initial attention.

² After this preliminary look at particular papers, you will judge whether they are of potential interest. You may reject several papers in this way before finding one that stimulates you to look closer. If you continue studying the paper, make notes about other literature cited in it, data used, analytical methods and principal results.

² Even at this early stage, keep orderly notes about the works you consult, including full bibliographical details.

4. There is one fundamental ingredient without which research will never begin. That ingredient is curiosity. If you have this, you will never have a problem finding a research topic. When you read papers, always ask yourself questions, such as:
 - ² Can the approach used in a study be applied to other contexts, countries or time periods?
 - ² What assumptions are implicit? Are all the assumptions sensible? To what extent might the results be sensitive to the assumptions? How can they be relaxed? Are there any unnecessary assumptions?
 - ² Is the econometric approach used the appropriate one? Have all relevant statistical tests been carried out?
 - ² Often, precise data relating to the theoretical concepts are not available. Are the constructed variables the most appropriate for the task?
 - ² Are there any implications of the study which have not been fully drawn out by the author? Can these be exploited in your work?
5. In addition to curiosity, you also need a willingness and the energy to pursue avenues, even if some of these may lead to a dead end. Furthermore, you need the imagination and flexibility to overcome the many inevitable problems along the road. You also require good judgement to select the appropriate techniques of analysis, to decide which aspects can be safely ignored and which assumptions are fundamental for the particular context, and to assess the value of your results at each stage. The best research reports will reflect these qualities.

3.2 The Plan of Attack

Research should not be allowed to drift along in a haphazard way: planning is crucial. You should have a plan for the 'big picture' as well as having daily or weekly lists of things to be done.

1. At a very early stage, draw up a detailed table of contents. This may take several days, as working out the arrangement of material is often difficult. The table should contain all your chapter, section and subsection titles. This plan allows you to see the sequence at a glance. In writing, you will not necessarily move linearly from the first to the last chapter, and having a clear view of the arrangement will allow you more easily to write in the most convenient order, while keeping the overall shape in mind.
2. Attach a time schedule to your plan. Aim to finish with several weeks to spare. This will allow you to leave the paper alone for a while and then give it a final polish after returning to it refreshed. You will be surprised by how many small but significant improvements can be made.
3. Start writing immediately. As mentioned above, writing is itself a process of discovery, revealing gaps in the argument (and your own understanding) and suggesting new lines of enquiry.

4 Basic Features of a Research Paper

4.1 General Points

1. It has been mentioned more than once that you must specify the precise questions that drive your research. The reader of your paper has to be made familiar with these questions and the broad structure of your paper or thesis at an early stage. You must provide the motivation for the study and the approach. The following advice to theatrical producers, by W.S. Gilbert, may appear to be rather vague, but is worth repeating in this context: 'Tell 'em what you are going to do; let 'em see you doing it; then tell 'em what you have done'.
2. Your introduction needs to let the reader know, as quickly as possible, three important things. It must answer the questions 'what', 'why' and 'how'. Do not digress, but say what is already known and signal what is new about your own work. It is worth returning to your introduction at the last stage

in the 'polishing' process. As suggested by Blaise Pascal, 'the last thing one knows in constructing a work is what to put in 'first'. However, remember that your introduction should be intelligible to someone turning to the topic for the first time.

3. You need to give the reader a clear view of where each section or chapter is going. Provide plenty of signposts, which point the way forward. These can most easily be added at a later stage, after the first draft has been completed. Ensure that you have provided appropriate linkages between various sections. These help to clarify the logical structure of your thesis.
4. Try to form a clear view of your reader. In particular, you are not writing a text book, so a certain amount of knowledge can be assumed. However, avoid being too allusive. It is perhaps useful, in getting the level right, to imagine that you are giving a seminar presentation to your peers.
5. Remember that the first draft is not the final draft: it is simply the start of a long process of revision. It is worth keeping in mind Samuel Johnson's statement that 'what is written without effort is in general read without pleasure'. It is remarkable how small changes to crucial expressions, or minor rearrangements of material, can improve the clarity substantially.

4.2 Some Proprieties

There are many aspects of writing research reports, such as style and arrangement, which involve choices. However, there are some things that must be done to satisfy the minimum requirements of scholarship. These are listed here.

1. Always acknowledge earlier work. Give precise sources of the results, diagrams and equations of other authors.
2. State when you are summarising other people's arguments. This also helps you to be explicit about precisely how you have made modifications and original contributions.

3. Ensure that quotations are accurate and give exact page references. Do not alter quotations by, for example, adding emphasis (with italics). Avoid the use of ellipses (...), at least if the material omitted is part of the argument in the quoted material, as distinct from an allusion or reference.
4. For all data sources, full details must be given, including page numbers. It must be possible for someone to replicate your results with the minimum of effort in obtaining the same data. Keep fully documented data files in case you are asked to make the data available to other researchers.
5. All bibliographical details in your list of references, arranged alphabetically by author, must be complete and accurate. A consistent style must be used regarding capitalisation, italics, initials, and ordering of material. This will require much more time than you imagine. Several styles are used, and each publisher and journal has its own house style. It is important, having settled on a style, to be consistent. Investigate style requirements imposed by your department or university at an early stage.

4.3 Some Mechanics

It is important to pay attention to the 'mechanics' of producing a research paper. For example, you must be consistent in the use of titles and numbering systems. Make decisions regarding the following aspects at an early stage as it can be very time consuming to make changes later.

1. You are unlikely to need more than three levels of titles. These are the chapter titles (numbered 1, 2, ...), section titles (numbered 1.1, 1.2, ...), and subsection titles (numbered 1.1.1, 1.1.2, ...). Use a consistent font, capitalisation, spacing and position (either centred or against the margin), so that the reader immediately identifies the status of the title. Keep the titles succinct but meaningful. The first sentence after the title should not rely on that title for its meaning.
2. For tables and figures use a decimal numbering system within chapters

(for example, Table 1.1, and so on). Give all tables and figures succinct descriptive titles. Refer to all tables and figures in the text. Produce separate lists of tables and figures after the contents page.

3. For equations, use a decimal numbering system within chapters. Number all equations, even if you do not refer to them. The numbers are useful when other researchers wish to make reference to the equations.
4. Use appendices for extensive data descriptions, longer derivations of analytical results, and for subsidiary analytical or empirical results. Do not use appendices to define notation.
5. Use footnotes for groups of references to literature, or qualifications of the main argument. Do not break a sentence with a footnote tag. Depending on the style requirements, endnotes may be used instead of footnotes. Be sparing in the use of footnotes; that is, avoid 'foot-and-note disease'.
6. In reporting others' work, use the past tense (as in, 'economist X found that ...'). In indicating the contents of your later chapters or sections, use the present tense (as in, 'section X reports estimates of ...').

4.4 The Literature Review

The aim of a literature review is to place your own work clearly within the larger picture. While research involves a focus on a narrow range of questions, it is obviously important to understand how it relates to wider issues. A brief review of the existing literature can help to provide some motivation for your analysis. In addition, it is only possible to establish a claim to have extended the literature by making clear the relevant contributions of others. This can often be achieved relatively quickly, without creating the need for a separate section or chapter.

Sometimes it may be necessary to provide an extensive review of earlier literature in a separate chapter. This presents a difficult challenge as it calls for quite a mature and confident approach. Ideally, the discussion of the literature should

be organised along analytical or taxonomic lines. This provides clear criteria for deciding whether, and where, an earlier work needs to be mentioned. Hence:

1. Start with a clear statement of the broad problem.
2. Distinguish alternative possible approaches, whose features may be:
 - ² analytical, involving a range of assumptions and techniques, or:
 - ² statistical/econometric, associated with data constraints and estimation techniques.
3. Refer to earlier contributions in the context of these different approaches. Some works may therefore be included only as part of a list while others, judged to be the most important, may require further discussion.
4. Indicate the strengths and weaknesses, in your judgement, of the various approaches and explain precisely where your study fits into the taxonomy.

The main thing to avoid is what might be called the 'card index' method, which consists of a dull and poorly organised sequence along the lines of, 'A said this ... B said that ... and C said ...'.

5 The Writing Process

5.1 Initial Hints

The aim of writing is to achieve clarity. This requires great care and a capacity to read your own work as if it were written by someone else. The economist Jacob Viner referred to two basic types of 'balderdash'. The first, simple balderdash, arises where the author believes that he or she understands, but cannot make it intelligible to the reader. The second, compound balderdash, comes in two varieties. In one variety, neither the author nor the reader can make any sense of the text, and in the second variety, the reader thinks he or she understands but the author knows it is meaningless. Your aim is to avoid such balderdash.

1. Recognise that your first draft will not be the last. There is a story of a visitor to an English stately house asking how the splendid lawns are produced; the answer is simply to sow the seed and then weed and roll it for five hundred years. An analogy can be drawn with good, clear writing.
2. Re-read as you go along. In particular, before turning to a new paragraph, read the previous one. Before starting a new writing session, re-read the previous work. This will help to improve continuity. Regularly check the linkages between sections.
3. Stop writing while at a convenient point, when it is going well. If your writing is going well, resist the temptation to keep going until you have reached the end of the particular section or chapter, or you have exhausted your current ideas. By stopping before reaching that point, you will find it much easier to pick up the work the next time and start again, knowing how it needs to proceed.
4. Ask a friend to read your draft. Be careful to select someone you know to be sympathetic and constructive, as any one can find negative things to say, however good the paper. As George Canning, the 19th century British Prime Minister, pleaded, 'save me from the Candid Friend'. However, do not try to defend the indefensible. Do not fall in love with your own writing. Be willing to respond to suggestions.
5. When reading through what you have written, try to produce a succinct summary of each paragraph. This will help to determine whether a subtitle is needed, or whether you should change the order of the material, or whether anything needs to be added to improve continuity or clarity. Ask yourself if it is repetitive. If you cannot summarise the paragraph, delete it!

5.2 Further Suggestions

A research paper is not meant to be read aloud or to entertain the reader. It should be written in a calm and clear manner so that the emphasis is always on the issue at hand. Some suggestions, largely of features to avoid, are listed here.

1. Avoid colloquial, conversational and highly personalised expressions.
2. Avoid abbreviations (such as &, don't, and etc.).
3. Avoid personal pronouns (I, we, you, me).
4. Avoid antiquated, verbose, pedantic and pompous language.
5. Do not be allusive.
6. Do not annoy the reader by making gratuitous negative remarks about others' work.
7. Avoid an excessive use of adjectives and adverbs. When editing your first draft, look out in particular for 'very', 'extremely' and 'highly', which are usually best deleted. In addition, 'had' can often be deleted.
8. Do not use metaphors, which usually add colour at the expense of clarity.
9. Be gender neutral. This can easily be achieved without mixing singular and plural or over-using 'he or she'.

6 Checklists

6.1 The Structure of The Analysis

1. Is the problem clearly stated?
2. Are hypotheses and assumptions explicit?
3. Is the relationship to previous work made clear?
4. Are the limitations acknowledged?

5. Are the data fully described and their precise sources given?
6. Are the conclusions explicitly stated?

6.2 The Basic Appearance of The Paper

1. Format: Check the prelims, title pages and contents pages.
2. Headings: Check the consistency of style, fonts, numbering, and spacing.
3. Quotations: Check their accuracy and page references. A large proportion of quotations are inaccurate!
4. Tables: Check titles, abbreviations and details needed for interpretation and cross-references.
5. Equations: Check numbering and cross-references.
6. References: Are all cited works included? (do not include those not cited) Are works in alphabetical order? Is the style consistent? Are all details given? (volume number, page numbers, date and place of publication, publisher).

7 Summary

There is no easy formula for producing good research papers. You need curiosity, energy, imagination and flexibility to overcome the inevitable problems. You also require good judgement to select the appropriate assumptions and techniques of analysis, and to assess the value of your results. The best research reports will reflect these qualities.

Many challenges must be overcome and even researchers with considerable experience cannot avoid going down dead ends, occasionally writing sentences containing one of the two types of balderdash described above, or even forgetting to mention their key findings and assumptions. All work must be checked as carefully as possible and all drafts must be edited and polished many times, paying close attention to detail as well as the overall shape and flow of the argument.

All this takes longer than envisaged. When planning your work, produce a generous estimate, fully allowing for the fact that everything takes longer { then double the time and add some more for good measure. This is not an exaggeration!

In developing a style of writing research papers, a great deal can be learned by close study of authors who are particularly clear. You may begin by imitating a style that you strongly admire and find attractive, but of course ultimately you need to find your own 'voice'. However, be warned that, as the jazz musician Miles Davis once said, 'sometimes you have to play a long time before you learn to sound like yourself'.