A first textbook of research methodology and thesis writeup for second language English speakers

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CHAPTER 1
EXPECTATIONS OF A STUDENT WHO IS WRITING A THESIS

The expectations that a supervisor has of a student will vary somewhat. You may find it helpful at a very early stage to discuss this list with your supervisor.

1. **A student must choose a topic that is within the area of interest, knowledge, and expertise of the supervisor**. Very few supervisors will consider other topics.

2. **Supervisors only sign their agreement to supervise once the Research Proposal is finalised.** Do not expect a supervisor to sign first and then the student writes the proposal.

3. **It takes time and a lot of effort** to first find a topic area, then narrow it down until there are testable questions that can be feasibly answered**. Therefore students need to begin early**. In addition, there is an initial literature review to prepare along with careful plans for how the data will be collected and analysed. All this goes into a Research Proposal, which must be written to a high standard of presentation, English, and referencing.

4. **Students must agree to do any supplementary reading/study in addition to the work directly needed for the research.**

5. **Students must make regular progress.** Failure to do so could result in a refusal of the supervisor to agree to continue supervision. They should organise their lives accordingly. Research must be given top priority. Twenty hours a week would be a minimum, and 40-50 more reasonable.

6. **Students should find out how the supervisor likes to be contacted,** and fit in with their preferences. They should also **not** expect to be able to contact the supervisor during the holidays, (though this may sometimes be possible) and they should plan accordingly.

7. **All students must speak for themselves vis à vis the administration.** They are responsible for finding out what the procedures are: deadlines, papers, signatures, etc. They must do all the work to ensure that these formalities are met.

8. **The appropriate system of references must be used.** It is the responsibility of the student to learn the system. A supervisor will answer questions on the fine points and on difficult examples, but will not expect to explain the basics.

9. **All decisions are the responsibility of the student.** The student is free to accept, modify, or reject, any advice given, and take the consequences.

10. **Students can expect a supervisor to:**
    a. Insist on testable questions/hypotheses
    b. Discuss and approve the data collection instruments.
    c. Advise on the thesis structure, flow of argument, cohesion etc
    d. Provide other advice at their discretion.

11. **No supervisor expects to tell students what to do.** Instead, students must provide their own ideas, and their own propositions, for evaluation. Research is not following a recipe: it is finding out something new, and writing about it in context and mastering the genre and the language of a thesis.

12. **The MA thesis writing process** is not one where a student follows the directions of the supervisor. Rather, it **is an apprenticeship**. The training involves growing in maturity in:
    a. **independent thinking**
    b. **responsibility, and decision making, in particular to:**
       1) decide on the topic for study
       2) decide what goes into the literature review
       3) decide what data to collect, and how to collect it
       4) collect and analyse the data
       5) show how the data answers the question/tests the hypothesis, and relate this to other published work/theories and arguments.
    c. **learning the genre of the thesis**, with its conventions
    d. **writing a thesis**, clearly, accurately, with a coherent argument.

13. **Students should avoid any project requiring permissions. Any work needing permissions, needs careful planning.** Permissions cannot always be obtained, and commonly cannot be obtained quickly. Students should avoid planning work that needs them OR they should make alternative plans at the very beginning.

14. **Students should choose a project where the data collection is easy and quick and be careful of the timing**
    Collecting data using questionnaires and interviews can be difficult since people are busy, and there are impossible times such as holidays and examinations. Timing can be crucial.

15. **A supervisor does NOT exist to correct your work. This means:**
    A supervisor may point out a few examples of the basic mistakes, then refuse to read or comment any further until these mistakes are eliminated.
    NB: It is up to the student to learn these basics. The supervisor is only there to arbitrate on the fine points of detail and in difficult cases. Surprisingly common basic mistakes include:
    ☞ **Punctuation.** A common error I will demonstrate at

the end of this sentence .As you can see there is an error that is intolerable.

☞ **In text referencing errors**: inadequate referencing, inconsistent referencing style etc

☞ **List of references**: incorrect use of italics for books and journals etc

☞ **Quotations**: incorrect academic style, etc

16. **All students will provide outlines for all their chapters**. It should be possible to follow your argument just by reading the headlines.

17. **Do NOT expect a supervisor to read every paragraph in a thesis**.
    Do not expect a supervisor to read in detail every draft. It is helpful when students provide alongside a thesis a short list of questions and comments such as:
    a. Please read carefully the data presentation
    b. Please check that I have included every section in the conclusions
    c. What do you think of my argument?

18. **When you resubmit your work, provide also a separate commentary, in which you:**
    a. take each of the previous comments of the supervisor and explain and justify what you have done
    b. list the changes you have made.

19. **Writing a thesis is all about re-writing.** It is normal to write each chapter at least 4 times.
    You must make regular progress with a thesis. Re-writing takes 50-70% of the time. Plan accordingly.

20. **Give supervisors time to comment on your work.** All supervisors have busy seasons when they have less time for supervision. Also, near the deadline the number of students submitting work for feedback increases. **You cannot expect a supervisor to promptly provide a detailed commentary on your work just before your deadline.**

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CHAPTER 2
THE RESEARCH QUESTION

Most students have difficulties finding a research topic. This in part relates to not knowing what kind of research is appropriate at their level. Phillips & Pugh (1987:45) explain the three types of research that are possible. In addition, Wray *et al* (1998:8) mention a fourth type.

What you are looking for is a testable, doable project that meets the standards for a thesis at MA or PhD level.

A. Types of research

1. Exploratory research

A new problem/issue/topic, about which little is known, is tackled (attempted). In this case it is difficult to have precise ideas at the beginning. An example of this would be *Learning a new variety of the native language as an adult*. This whole field is wide open, there has been almost no research done at all. Adults when they set out to learn a new subject, especially one that is heavily language dependent, have special methods and attitudes. Yet most L1 research stops with teenagers.

It is L1 new-variety research that should be compared with advanced learners of ESP. The situation is complicated further when one of the languages has marked diglossia. Science is heavily language dependent, and has a high vocabulary (mainly nouns and adjectives) and makes extensive use of reasoning words. Science students struggle with vocabulary much more than arts students. It has been estimated that the average medical student learns 5000 new words a year - that means over 100 per week.

When I was re-reading the previous paragraph, I realised

a. The paragraph was incomplete
b. I could illustrate a teaching point here.

Like many student paragraphs, and many paragraphs in early drafts, the previous paragraph does not end properly. The paragraph is incomplete because I had not been explicit about the ***so what***? What is the writer getting at? With a bit of work there is enough in the paragraph for the reader to answer the question for themselves, but in English, and in Academic English especially, a writer must not make the reader work so hard. I needed to finish with a summary of what I am getting at. I suggest the following:

> So how students cope with high vocabulary courses in L1 (or in the language of teaching in countries where more than one language is used) is a relatively unexplored field of research.

2. **Testing-out research**
This means, taking an existing generalisation, or result, or piece of research, and seeing if it is valid in other circumstances. Simply by changing one of the variables, and repeating the work, is sufficient for an MA. This advice applies to all subjects, including literature. In a more sophisticated form it is also suitable for a PhD.

3. **Problem solving research**
In this type of research, a real problem from the real world is defined, and a solution is sought. A variety of methods and theories will probably be involved, maybe crossing more than one academic discipline. Doing a needs analysis for instance

could be the basis for an excellent MA thesis but NOT for a PhD.

The best type of research for an MA or a doctorate, is, as Phillips & Pugh (1987) argue, the testing-out kind. There are great advantages in working within an established framework, and the work should be clear, and narrow enough to give some results in a short space of time.

4. **Theory only projects**
   Wray *et al* (1998:8) present another type of research, which may well be of more interest to doctoral students, but is worth mentioning here. A thesis can be an evaluation of, or the development of a theory or model. Maybe a theory can be applied in a new area, and the implications explored. Maybe there are two competing theories to be assessed in the light of new evidence, or applied to a new situation (which in Literature could be another author, or work, or language, and in History could be another epoch). For instance, a theory developed for adult language acquisition could be modified for child language acquisition, as when a theory in Pragmatics was extended to cover children.

5. **Research that is NOT suitable**
   a. **'Action Research'.** This is a small investigation by a working teacher to find out more, and to possibly solve a small teaching problem. This may be suitable for a Professional M.Ed (Master of Education) or as a report as part of in-service training, but it is NOT suitable for a research degree.

   b. **Evaluation of teachers, a course, or a curriculum** Evaluation in the right circumstances can be very useful and informative, but it is NOT suitable for a research degree.

B. Finding a Research Question

1. Extension and replication research

One of the best ways forward is to find a piece of published research, and to replicate it, here in Tunisia, changing one or more of the variables. This has the major advantage that the field of study is clear, as is the question, and the methods and the significance and relevance to other work. Note, often the published information on the actual methods used is inadequate, but, coping with this will be part of the learning process. If a student does think about following this approach then a question must be, are the descriptions of methods clear and detailed enough for them to proceed with their own research?

It is most important that the topic chosen should be feasible (do-able), within all the constraints of working quickly in Tunisia, and be a new topic (or present a new twist to an old topic), and preferably be relevant to Tunisia.

In 2008 the leading journal **Language Teaching** (Cambridge University Press) announced that it will now devote a section of research papers dedicated exclusively to replication studies. The editor at the time, Graeme Porte, later went on to publish a book on this subject (2012) and a short summary in 2013. Porte points out that exact replication is rare. Usually there is an approximate replication or a conceptual replication. An **approximate replication** repeats the original study and changes one or two variables, so as to maintain comparability and aid in generalisation – the validity of the findings. A **conceptual replication** attempts to confirm/not confirm the original findings through using a different methodology or framework of analysis.

2. Do not be too ambitious in your choice of topic

Try to find something that is fresh. Students sometimes embark on areas that are already well-covered and in which there is a large amount of critical commentary (secondary sources). The result is that they inevitably find themselves over-burdened with reading through these secondary sources and end by offering a ‘rehash’ of existing approaches. A project on

'Women in Shakespeare' or 'American Foreign Policy in South-East Asia in the 1960s' or 'English Language Teaching in Tunisia' would entail these problems. A study of much more recent texts or events or linguistics issues is much more likely to be innovative. At the MA level you will not be expected to produce something totally original, but you should avoid the opposite extreme of working on a subject which is thoroughly explored. (Abdeljawad *et al* 1998:14)

3. **Do not be afraid of a negative result**
   Sometimes students are afraid they will not find a difference. For instance, one student was concerned over my suggestion that they compared eponyms in English and French. Now I know that there are a few differences, but that is not the point. At the time I did not know how many there were, but I suspected there were enough for a MA. It is generally believed that eponyms are similar in English and French, and if on careful study this is confirmed then this is a result. If it is not confirmed, then that in itself is a useful result.

   Since much work done at MA level by its nature will tend to confirm what is already known, students should not avoid and should not be afraid of a negative result.

4. **Choose an elastic question**
   This advice now applies particularly to MA, but can apply to PhD. Practically speaking, the best questions are elastic. You know that if one question is answered quickly there is another related question, and at the other extreme, you know that if the question will take too long to answer then you can stop and focus just on one small part. It is comforting to start out knowing that there are several possible parts, and if one of them takes a whole thesis, then that is enough, but if the part is done quickly then you have other parts you can also go on to. The eponyms project mentioned above is in fact extremely elastic. There are many small related questions that could be asked and answered using data which is readily available.

Another approach when time presses is to cover all the questions briefly, then focus on one or two details for further study. So, for instance, you might do a questionnaire, then focus on part of it when you do some in depth interviews.

C. Is it a Question or a Hypothesis or extent?

1. The problem stated

When you have a question, you do not know what you will find. For instance,

- What are the attitudes of teachers to their textbooks?'

When you have a hypothesis you actually have a prediction and you set out to establish or disprove your hypothesis. To some extent, question vs hypothesis is two sides of one coin.

Figure 2.1 Hypotheses restated as questions

Hypothesis	Question
I predict that secondary school teachers of English in Tunisia really like their textbooks	To what extent do secondary school teachers of English in Tunisia really like their textbooks?
I predict that middle school teachers of English in Tunisia really dislike their textbooks	How do middle school teachers of English in Tunisia view their textbooks?

Another profitable approach is to ask the question, 'to what extent is ....'. This has the advantage that it produces useful results. For instance in my own work on the language of science between French and English, after showing that there were major differences, I then tried to measure the extent of the differences.

2. MA work

In a thesis, usually you choose one side of the coin: you either have questions, OR you have hypotheses. Choose one way of proceeding and stick to it.

3. **Doctoral work**
   In doctoral work, the experimental data collection may take place over several stages. Therefore it is quite possible that initial enquiries will become specific questions or hypotheses. It is quite possible in a longer period of work over a few years to have a series of decision times in which new hypotheses or questions are set out, or the hypotheses are revised in the light of the work accomplished to date.

4. **Questions are sometimes more interesting than hypotheses**
   This statement is difficult to explain. Experts in a subject will have developed an instinct for what is important and interesting, and what is not. This sense will vary somewhat ie there will be differences of opinion, but the sense is recognisably there, and is discussed in obscure corners of academia for instance in some methodology and statistics books.

   Elsewhere, especially in commenting on the literature review and the writing process, I encourage you to ask and answer the killer question: So what? This question also needs to be asked right at the beginning. Are the likely findings going to be interesting, or are they stating what is banal and obvious?

   Interesting does not necessarily equate with useful. There are many interesting questions with no immediate use. Some of the best ideas in science started from curiosity, with no immediate application, eg lasers. But, often something that is interesting is something that is useful to other people, such as language learners and teachers.

   Better an approximate answer to an interesting question, than a precise answer to a dull hypothesis.

   In my own research I began with an interesting situation and some initial hypotheses, specifically focussed on the use of definitions in science. Therefore I began with ethnography, and at one point was faced with a crucial choice of direction: Was I going to write my thesis as an ethnographic study of an interesting school? The school was unique, and it is a real pity that this study was not done. Or was I going to take a question in linguistics which had wider implications, and study it thoroughly? I chose linguistics, but my ethnographical work was not wasted because it provided an intimate grasp of the local context, which was crucial for the interpretation of the data.

5. **A hypothesis can be turned into an interesting question**
   In the detailed examples of hypotheses and sub-hypotheses presented below, instead of aiming at hypothesis verification, I asked the question, for each area of the language of science, "to what extent is this part of the language of science between French and English at Baccalaureate level, identical?

   You can turn a hypothesis into a question by asking, to what extent it is valid.

   In my case, after testing over 40 sub-hypotheses based on clearly defined areas of the language of science, I was able to establish that the language of science was only 100% the same for the symbols of the chemical elements. Even the formulae used in mathematics were not necessarily similar across languages. By establishing the areas where the hypothesis was most applicable, and documenting the differences, I was able to provide useful material in an easily understood and learnable format for scientists working between French and English.

D. Hypotheses

1. Introduction to hypotheses

When we do research, we work within a theoretical context. In the literature review, the theoretical perspectives are set forth. At some point, the actual research question or hypotheses need to be stated. One of the biggest problems beginners have is that their questions are usually:

- too broad
- too vague
- too general
- unsupported by evidence
- not phrased in operational (testable) terms.

It takes a lot of hard work and clear reasoning to think through the research to the point where you have a question that is:

- up to date
- reasonably original
- interesting, both to you and to a wider audience
- small
- precise
- testable.

One of the best ways forward is for students to extend and develop an existing question rather than tackle a big subject. In this chapter I want to discuss in more detail how to frame research hypotheses.

2. A hypothesis should be worded in operational terms

Operational means testable. **How can the hypothesis be tested?** How can the change or the feature or the quality be measured? Serious effort must be made to spell out in unambiguous terms what the hypotheses really are.

Why are these detailed examples provided?

- Studying good examples is a good way to learn
- Clear hypotheses provide a good framework for collecting, analysing, and presenting the results
- The examples show how useful it is to have detailed hypotheses and sub-hypotheses
- Note well, the matching of sub-hypotheses with sub-conclusions

3. Example from Lowe 1992: initial considerations

I remember in my own doctoral research that hypothesis writing was the most difficult and the most significant part of my work. I spent over a year doing preliminary studies, studying an interesting situation, collecting lots of data. But all this data needed organising, and at the end of the day I needed something significant and original to say. So at one point a teacher asked to see me. She had formerly been a chief examiner for 'A' level biology and was well used to insisting on precision. She asked me what my hypotheses were. I replied something like ‘the language of science was supposed to be international’. That was not good enough. For an hour she grilled me. I went away, cancelled all non-urgent and non-binding engagements, and for three weeks I sweated. After three weeks of the hardest and frightening work in my life I ended up with over 50 testable sub-hypotheses. I knew I had a thesis. Finishing was just a matter of three more years of hard work. During that two weeks I reasoned as follows:

> The language of science is supposed to be international. But the language of science is huge. Let me break it down, and then break it down even more. There are many different angles on this, and each angle can be a huge pyramid.

a. The languages

First, I wanted to focus on the language of science between English and French. That excluded other languages, though I did find comparisons with Russian and German, and this often gave me clues as to what to look for in English and French.

b. The academic level

This was crucial. It required a whole discussion of the similarities and differences between the different levels of science, from absolute beginner, through school science, university science, and professional researcher science. One conclusion eventually was that school science differences sometimes did not exist at a higher level, partly due to the expert tolerance and knowledge of minor difference. Obviously I chose Baccalaureate level, which excluded the science for beginners and science for the experts. I also found and discussed a model of science that linked together the different levels of expertise in a subject. This was an important framework, presented in the literature review and later revisited in the discussion chapters and extended to cover a bilingual situation.

c. Which science subjects?

I restricted myself to the sciences taught in the schools, ie physics, chemistry, biology, and some mathematics. My own low level of mathematics meant this area had to be simple, and this was a fair limitation of the research.

d. Which curriculum?

The focus was the curriculum of Tunisia. This meant I could and did compare with France, UK, and America, especially as the schools had teachers from Britain and France, whose expertise I was able to draw on many times. This had practical limitations. For instance, one area was disease names, and I restricted myself to disease names mentioned in the textbooks, and since there were so few, I had to say at the end of this chapter of results ‘There is not enough evidence to draw a conclusion’. I had to go on to have an intimate knowledge of the curricula in four countries so that I could put the findings in the wider context.

e. Which years?

The years of study were 1987-1989. This was important. A few years later for instance, France changed over to the

English way of naming in organic chemistry. There was also the interesting question in the names of species in biology – the so called 'taxonomy' that the nomenclature was in a state of change in both languages. All this had to be carefully identified and great care taken to make fair comparisons.

f. The linguistic levels of the language of science
The language of science is at many levels. I identified four: symbols, words, sentence, and genre/discourse. I decided to concentrate on symbols and words. Both these are expanded below.

g. For words, what about specialised words, and mixed words?
Language in science is a mixture of specialised words, mixed words (common words with a separate specific meaning in science) and general words. I decided to include both specialised and mixed words, partly because the distinction is often hard to decide and maintain, partly because in the discourse of science, both types are used.

4. Example from Lowe 1992: the non-verbals
Widdowson had, fortuitously, proposed that science, being universal, would have a linguistic expression particularly for the non-verbals that was international. He did NOT extend this to words, but in the situation it was taken for granted that the language of science was international to a large extent, and differences would be few and minor.

For the non-verbals, I identified four distinct areas: symbols, indices, equations, miscellaneous. Even this was not good enough. The subject areas were often too broad. I asked myself repeatedly, If the language of science is universal, what would I expect to find? The ideal was to break down the question into smaller and smaller areas until I had a small definable subject area. For the Symbols, I specified eight clear sub-hypotheses, and after collecting the evidence, (results) and presenting a discussion, I was able to write the corresponding sub-conclusions. This material I have presented in figures 2:1-3 below.

Figure 2.2 Diagram to show how an area of knowledge was systematically narrowed down until highly specific research hypotheses could be stated in the area of symbols

Language of Science
⇓
English and French
⇓
Baccalaureate level
⇓
Non verbals
⇓
Symbols (also indices, equations, miscellaneous)
⇓
33 examples, some of them groups in their own right which needed subdividing

Figure 2.3 The sub-hypotheses for symbols
(Lowe 1992 p19.4)

The following will be the same in English and French, both in form and in usage at school level:

a. Conventions for expressing vector quantities
b. Symbols for units.
c. Symbols for quantities.
d. Punctuation and orthography.
e. Symbols in biology.
f. Symbols in physics.
g. The non-SI symbols in chemistry
h. Symbols in mathematics.

Note 1. SI refers to the International System of units, commonly known as the metric system.
Note 2. The page numbering in the thesis was [chapter].[page number]... a system found in some textbooks and my university advised us to do this so that each chapter could be written independently.

Notice the precision of the sub-hypotheses, and the precision by which each sub-hypothesis led to matching unambiguous sub-conclusions. The sub-hypotheses were very operational ie testable, and data was collected to test each one of them. The data was easy to organise because of the precision of the sub-hypotheses, and their logical coherent arrangement. Later in the discussion, the summarised findings were interpreted in terms of various sociolinguistic questions, such as the curriculum, language change, and attempts to standardise the language.

Figure 2.4 Sub-conclusions for the symbols
(Lowe 1992 p19:30-1)

a. *Vector quantities*
There are different ways of representing vector quantities in English and French. In addition, in French at school level, a vector quantity is always indicated as such, whereas in English no indication is routinely given. Therefore symbols and distinction are not fully constant.

b. *Units*
The SI system is intended to be an international system, but its implementation at school level may not be. Non-standard units such as the calorie in both their name and their measurement symbols appear to be the same. Some differences exist which indicates that constancy has yet to be achieved. Some recent changes for example in what is standard, for pressure and temperature, will take time to work through even in English.

c. *Quantities*
Symbols for quantities are not necessarily constant. Changes in chemical quantities, (relevant to 'A' level chemistry but at too high a level for students in the Baccalaureate system in Tunisia to know about), are currently proposed, therefore are unlikely to be international as yet. Blood pressure in French is routinely expressed in centimetres of mercury with systolic pressure alone given, not millimetres of mercury with both systolic and diastolic pressures given as in English.

d. *Punctuation and orthography*
Punctuation in science is not necessarily constant. Several differences between French and English have been noted, including the decimal point, the 1000 grouping symbol, the handwriting of numbers and the punctuation of formulae in organic chemistry.

e. *Biology*
A standard system of notation for osmosis has yet to be worked out, therefore any in current use cannot be confidently regarded as international. Not all the symbols used in genetics are international, but the basic symbols of genetic pedigree are.

f. *Physics*
Not all the electrical symbols used in school physics are constant. g. *Symbols in Chemistry*
The symbols for chemical elements are without any doubt the same in English and French. State symbols, and dot and cross diagrams are not constant between English and French. Old systems for representing charge on ions are still being used in French. A system for oxidation numbers has yet to be agreed therefore there cannot yet be any symbolic representation that is international.

h. *Mathematics*
Several symbols in French and English have different meanings and uses. The distinction between numeric and algebraic value is not normally made in English, while in French it is routinely made. The same symbol is used for both in English, therefore symbols and distinctions are not (in practice) constant.

5. **Example from Lowe 1992, the verbals**
   As I have already explained, the language of science had been narrowed to that between English and French at school level. The problem now was that the terminology used by linguists was confusing. Later I had to review the terminology question, sort out the different meanings from different writers in the different fields of translation, school science, and ESP. I needed to distinguish between common words, common words with a technical science sense (which I labelled ‘mixed’ words), and technical words, and to explain that I would be considering the language of science to apply to technical words and mixed words. All this clarity was worked on later, though it was presented in the thesis before I introduced the details of the hypotheses. This illustrates a point. Research is often messy, but the presentation must be logical.

Figure 2.5 below shows this process of narrowing.

Figure 2.5 Diagram to show the narrowing process for words, and chemical terminology

Language of Science
⇓
English and French
⇓
Baccalaureate level
⇓
Verbals
⇓

Chemical terminology
Faux amis,
Definitions,
Linkwords,
Affixes,
Abbreviations,
Eponyms,
Disease names,
Taxonomy

In addition, some of these items needed further subdividing. The example of chemical terminology is given below.

Figure 2.6 Diagram to show how Chemical Terminology was further subdivided

Chemical terminology was subdivided into:

a. Names of the elements
b. Inorganic nomenclature
c. Organic chemistry
d. Reagents and tests
e. Enzymes
f. Vitamins and minerals
g. Sugars
h. Amino acids

I studied each of these in turn. Each of them had a series of sub-hypotheses written, each of which was measurable and testable. One example, b, is given to show how it in turn was subdivided.

Figure 2.7 Example sub-hypotheses: inorganic chemistry (Lowe 1992 p17:3**)**

b. *Inorganic chemistry. Sub-hypotheses*
1) The nomenclature for chemicals which, at least at school level, have been known for decades or more, is fixed and not changing, in both languages. Or if it can be shown that there is evolution taking place then:
2) The state of development is the same in both languages
3) There is only one, consistent, acceptable system.

Figure 2.8 Example matching sub-conclusions: inorganic chemistry (Lowe 1992 p17:15)

b. *Inorganic chemistry. Sub-conclusions*
This sub-hypothesis has not been adequately tested. There is though sufficient evidence to show that the sub-hypotheses can fail: differences between English and French do exist. The state of progress towards a more international system is not necessarily the same in English and French.

Note that I was unafraid to admit that I had not fully tested the sub-hypothesis. I was able though to make some informative comments. Another example is given below in figures 2:8 and 2:9 concerning definitions.

Notice that the sub-hypotheses covered all the different possibilities and scenarios.

I then systematically looked for examples which did not agree with the sub-hypotheses, from the three sciences and mathematics. See Section E below, where I argue it is easier to disprove an argument than to prove an argument. At the end I was able to state three matching sub-conclusions.

The close match between sub-hypotheses and sub-conclusions can perhaps best be seen in the figure 2.9 below where the same information is presented as a table.

Figure 2.9 Table showing careful matching of sub-hypotheses and sub-conclusions

Sub-hypotheses	Matching sub-conclusions
a. Where definitions are used, the content of these definitions will be the same in English and French. The scientific language of definitions will be international.	Definitions in science in English and French are not necessarily the same in form or content.
b. Where there are sets of inter-related words there will be: 1) no ambiguity within a language 2) complete correspondence between English and French sets of inter-related words. 3) no faux amis	When several inter-related words are used in making definitions, the internationalness of definitions is not helped when there is ambiguity within a language, and the situation can be further complicated by faux amis and a lack of correspondence between related words in the two languages.
c. Where a choice of words is possible, for the same phenomena, the choice made will be the same in English and French, for the given level in the school.	Given that a choice of words exists to define the same phenomena in English and French, it is not possible to assume that the same choice will be made in each language at school level. (p9.23)

6. **Lessons to be learned from these examples**
   What these examples show is that **hypotheses need to be very clearly spelled out**. I did this by reducing the subject area covered, taking into account other variables, and being very unambiguous about what I expected to find. The format of giving clear sub-hypotheses, presenting the data, then presenting clear sub-conclusions is also worth noting. The format led to great clarity of argument and presentation, and is extremely easy for any reader to follow.

   The hypotheses were clear, precise, and measurable.

In experimental work using statistics, a similar method is followed. First, the whole 'population' is defined and described. If possible, work is done on the whole population. Usually this is not possible, therefore careful sampling is needed. Here I have also mentioned another way: **divide, hypothesise and test.** By dividing the problem up, so, where possible, ALL the division was studyable, I was able to make clear hypotheses. **These hypotheses were written in advance**. My supervisor only allowed me to proceed when the fifty or so sub-hypotheses had been clearly stated, in measurable terms, BEFORE I collected and analysed the data. There could be no going back! I never dreamed of looking at the data and tweaking my hypotheses to suit my argument.

This is an important point, and I revisit it in my books on statistics. It is all too easy to do multiple correlations, and one looks interesting, because sooner or later one will be interesting, just by chance. But the interesting 'significant' result is only fair if it is predicted in advance. See also Key 17 of *A feel for statistics*, in which general and particular probability is discussed.

Figure 2.9 also shows that the sub-conclusions need to be equally precise, and need to be clearly and systematically linked to the sub-hypotheses.

My observation of student theses is that very few students are as careful in their work as they need to be at this point. I often find that once research hypotheses are stated, they seem to be ignored. Yet the hypotheses are the skeleton of the thesis – the golden thread that links the whole thesis together. They need to be constantly there, explicitly, and implicitly. They are your constant guide to decide what to include and what to exclude in a thesis, to decide which methods to use, to guide the interpretation of the results.

E. Proof and disproof

1. Disproof is easier than proof

It was Karl Popper who set forth very clearly that hypotheses should be worded in a manner than makes them testable, and that hypotheses can be disproved but never proved. Therefore one way of working in science is to set up a hypothesis, then to actively seek to disprove the hypothesis.

Immediately, the smart reader will say that the idea of refuting a hypothesis is similar to the unacceptable *straw man* argument.

> **A Straw Man argument**
> Sometimes people misinterpret their opponent, and describe their views wrongly, then proceed to show that these views are false: they are attacking views which are not held by their opponent, therefore they are said to be attacking a 'straw man'.

It is an easy trap to fall into. It is easy to set up a hypothesis that no one actually holds, then to attack it. Therefore **great care needs to be taken with hypotheses to make sure that they are either held by someone in the field of study, or are reasonable extensions of views which are held**. The literature review is the place for showing how the research questions are rooted in the body of knowledge of the subject.

Logically and practically it is much easier to knock down a theory than to set up a theory. But be careful: it is easy to misinterpret Popper. People easily think that it takes only one example to disprove a hypothesis. Popper is more sophisticated. Popper distinguishes between the logic of the situation and the implied methodology.

Logically one contrary observation refutes a hypothesis,
Methodologically one contrary observation does not necessarily refute a hypothesis. Instead one must question and refine the methods and observations.

Therefore, while for good practical reasons it is good to *harden* a hypothesis, to stiffen it up, to make it more black and white without shades of grey, there is **another question that is worth asking**. To what extent is xxx valid, to what extent is it true? In my own research I asked, To what extent is the language of science between English and French similar at school level?

When asking ***To what extent?***, this can only be answered if the subject areas are small enough so that ALL the examples can be studied, hence the work done to establish small definable areas for the sub-hypotheses. For the names of the elements this was easy since there was a complete list available. When you ask the question, *to what extent* you are also closer to establishing the real significance of a result. Often results can be banal, telling us nothing new. Maybe the difference has no practical importance for one reason or another. Maybe there are so few differences that they can be ignored. Maybe there are a lot of differences. It is rather like writing a rule of grammar. A few exceptions can be learned, but many exceptions mean that the rule needs revising.

2. **Example of qualified valid disproof**
   In Europe and America there is a common genetically acquired condition called Cystic Fibrosis.(French: *mucovicidose*). It is a very complicated condition, touching people in differing ways at different degrees of severity. There is no known cure. The main cause of death is due to the lungs being weakened, and subsequent lung infections, especially of certain very common organisms that most normal healthy people are resistant to. One of these is Pseudomonas aeruginosa (which is also highly dangerous to people who are badly burned, and once infected the death rate is high). Normally this bacteria is freely available in the environment. Therefore it is conventional wisdom in medical circles that when a patient with Cystic Fibrosis has a Pseudomonas aeruginosa infection, then those caring for the patient need not fear; the carers, and those in contact with the patient, will not develop an infection. In short, the patient is not contagious.

McCallum *et al* (2002) report a case where a patient did infect non-CF relatives, and infected them with a more dangerous strain than those normally found in the environment. The parents required hospital treatment including intravenous antibiotics, and in addition the parents were subsequently recolonised despite initial eradication. Therefore it is no longer 100 percent true that the carers cannot be infected from a CF patient.

One example therefore has logically disproved the general expectation, but the expectation is still valid, because there are serious methodological questions, discussed in the paper. Readers are expected to know that lung damage is very difficult to quantify or measure, therefore in reporting no obvious lung damage, they do not rule out that prior slight lung damage (called bronchiectasis) enabled colonisation by this dangerous organism. The conclusion is that parents and health workers who develop persistent chest symptoms be screened for this organism. Normal people are not at risk, but a few, rare people, those who perhaps already have lung damage, are at risk when caring for these patients.

3. **Example of wrong expectations of disproof**
   Pinker is well known as a writer on child language development. In his book, "Language learnability and language development", (Harvard University Press 1996 p33), he apparently says,

   > I take it to be noncontroversial that a theory that can explain facts in some domain has a prima facie claim to be considered as true. To refute such a claim, one would be better off proposing an alternative theory than reiterating one's skepticisms or appealing to apropristic arguments. (cited in Harpaz 2003 np).

As Harpaz goes on to point out, the requirement that opponents first put forwards a better alternative is not fair. "...the proper way to refute a theory is to bring empirical evidence that is incompatible with it" (internetm np).

Pinker is saying that when there is a well established theory, you can only reject it if you have a better alternative theory. Harpaz is saying that this is not so. A theory is rejected on the basis of the evidence, and the credibility of an alternative theory is irrelevant.

Harpaz's argument rings true. I well remember in the Baccalaureate studying the different models of the atom. We did so historically. The first model we studied was the so called "currant bun"model. This at the time did explain well many known facts. Did it therefore have a prima facie claim to be true? Not at all. Nobody seriously thought the model was true. the model was the best picture, the best analogy, that fitted the known facts at the time. It was replaced over the years by a whole series of models, each one closer to the truth. Though alternative models were developed, a large part of the rejection of the models was the empirical evidence presented that refuted them. This is completely different to Pinker and others who insist that ONLY evolution is a valid explanation because they dislike and discount the alternatives.

4. **Hypotheses should be strong enough to be testable**
    a. In the academic world, strong statements require strong evidence, argument, or support from other authors who have provided evidence/argument.

    b. Contrary to some cultures, in the academic world, any strong statement is quite easy to attack or oppose or discuss. Far from being a discussion stopper, it is a discussion enhancer. The reasons should be obvious, and I am frequently surprised when educated people seem incapable of applying their training to the everyday world.

5. **Conclusions and summary**
    a. Sub-hypotheses must be set out with great clarity and precision BEFORE data is collected and analysed. It is no use collecting data, doing some statistical correlations, and then creating hypotheses! That is dishonest work.

b. In all theses, there needs to be a clear one-to-one link between conclusions and hypotheses, as in the example above.

c. A plan for data analysis must be made BEFORE data is collected, otherwise you risk selective interpretation after the event.

d. In order to proceed, you often have to establish clear categories. Data has to go into only one category. Therefore, clear criteria and definitions need establishing BEFORE the data is analysed, otherwise the temptation to move the goalposts to suit your convenience will be too strong.

e. There is a difference between logical disproof, and practical disproof. It is possible to have a rule with a few exceptions. It is possible to ask, 'to what extent' a hypothesis is true, and then set out the factors influencing this extent.

f. For PhD work, I also recommend that you do some initial surveying and pilot work. You need to know that your research will finish with a PhD that meets the standards of a PhD. Better to discover a dead end BEFORE you write your research proposal than have major problems later.

At the end of the narrowing process, you should have a series of questions or hypotheses which are narrow, testable and suitable for an MA or PhD. You are now ready to write your research proposal.

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CHAPTER 3
THE RESEARCH PROPOSAL

1. Why is a research proposal required?

Many students resent the requirement for a research proposal, and they especially resent the way that the requirements are so demanding. Surely it is enough to simply have a topic, a rough idea of the subject area they wish to research!

There are some universities, or rather, some heads of department, who do not insist on a formal proposal for an MA or PhD thesis. In my own career, for my PhD I was only asked for a proposal of one page that was 'enough to get you started'. If I had been asked to produce a detailed research proposal as explained in this chapter I would never have been able to start. But, before I started my PhD I already had several years of training and practice in research including original research later published by my supervisor, and I had work experience that included original research – and the references to prove it. The head of department took a calculated risk with me. I was in fact permitted to do this also because the research – at least at the beginning – was the risky 'exploratory' type (See Chapter 2) and the research questions came later.

If a student comes to me with a similar track record and background then I would advise them to write a proposal then conveniently ignore it and get on with the research. But such students are extremely rare.

A colleague once encouraged me to stress to my classes the importance of a good research proposal when he shared what had happened to him.

When thinking of a PhD he researched it, and even went to the extent of doing some initial research – like a pilot study – and found that his idea was unworkable. So, disappointed but not deterred he found another topic. Again, he did some initial research to develop his ideas and see if they were feasible with a view to a proposal acceptable for the start of a PhD. Again, he found that his initial ideas were unworkable. Many would have given up at this stage. It was only his third idea which was workable, and he developed it quickly now because he had learned many research skills in the previous failed attempts. With hindsight, my colleague said that he was glad his supervisor had been so strict with him at the early stage, and he was glad that he did not enroll for his PhD until he had a clear and well developed proposal.

In over 15 years of supervising students, it has been my overwhelming experience that the tougher I have been on a student at the research proposal stage, the easier it has subsequently been for the student, and the work has been to a higher standard.

So, do not despair over the research proposal: it is essential for most researchers, and the work put into a good proposal is never lost. It is extremely hard to narrow down a subject and to write a doable proposal, but this is a hurdle that everyone has to overcome and is part of the life and skills of a good researcher.

Writing a research proposal is also the stage when bad habits of language and presentation show themselves. The expectation is that the proposal will be in perfect English and referencing will also be perfect.

In my experience, many students want to rush the proposal, and expect the writing and presentation standards to be low.

Yet, from the beginning, a supervisor has a right – nay they have a duty!!– to insist on perfect language and presentation. The sooner this point is confronted the better. **Students need to start the way they wish to finish – with perfect English.**

2. The objects of the research proposal are to show that:

a. **you have found a research question**

b. **the question is up to date**

c. **you are up to date in the field of the research**
For instance, it is no longer allowable to say that how students learn vocabulary is a neglected area of research, even if some of the references from the 1980s say so, unless you can prove that the gap still exists, and that the neglect still continues.

d. **you are aware of the main theoretical viewpoints** in the chosen area of research

e. **the question can be clearly stated**

f. **the question can be tested**, (studied, treated, elaborated) with all the limitations of working quickly, and in Tunisia

g. **you know which methods to use**

h. **You have made initial plans as to how you will evaluated the data.**

i. **you have an initial awareness of the implications** of what the answers to your question will be for the discipline/subject area/topic/theory

Items b. c. and d. form a brief literature review. No one is expecting you to have read all the literature and to have done all your research! A research proposal is an initial document showing that you have found an answerable question.

3. Follow the 'Create a research space' framework
You should broadly follow, and expand upon, Swales' "Create a Research Space" model (Swales 1990, see Jordan 1997:232-3 or similar model since there are several versions of this model). Applied to proposals, rather than article introductions, this means:

a. **State the general area of research**. Consider here one or more of the following :
   1) discipline
   2) topic
   3) theory/theories/viewpoints
   4) the leading players or authorities in the field. In all these areas you should give the main references, leaving a longer selection for the actual thesis.

b. **Identify a gap in the knowledge**, and lead up to your research question or hypothesis.

c. **Make proposals how you intend to fill the gap**
   Here you need to state the methods you intend to use, and what you intend to do. You should also comment on the limitations of what is practical for you in your circumstances.

d. **Give a preliminary assessment** of the likely significance of your work.

e. **Provide a bibliography**
   For a masters, 10 items is adequate if these are the key references while 30 references would be too many. For a PhD you are looking at 30-50 references.

   Do not forget to include some references to methodology. Eg, if you refer to questionnaires, then give at least three recent references which have significant advice on writing questionnaires.

You may if you wish provide two lists, "References consulted" and "References to be consulted".

4. You must follow the normal referencing styles and conventions

Whatever style you follow – usually a variant of the APA or the MLA style – you must now show that you know it, and are consistent, and know how and what to reference. **A good research proposal is usually well referenced, which means that every idea/theory/viewpoint needs referencing along with proof of the gap in the knowledge.**

5. A typical research proposal pattern

- Title
- Abstract
- Introduction
- The literature review, which covers the background to the thesis
- The initial research questions/hypotheses
- Methods
- Initial assessment of likely results
- References

6. Length

See local requirements.

a. For Masters, 4 good pages, single spaced ie 2000 words.
b. For PhD at least 10 pages, single spaced ie 5000 words.

7. Usefulness of a research proposal

Most students and teachers find a research proposal to be a very useful document. The trouble is that though it is small, the effort involved in writing it can be immense. The major benefit is that once you have a good proposal with the accompanying clear hypotheses and data analysis intentions, the rest of the process of getting a Masters or a Doctorate is just work.

Of course, research involves venturing into the unknown. Many researchers face and overcome new obstacles, and end up in unforseen directions. A supervisor may ask a student who is off course to re-read their proposal. Conversely, a supervisor will usually allow a student to take a completely different direction – following the evidence and logic of the work that evolves in unexpected ways.

For good students, a proposal exists to show that they have enough to get started. For most students a substantial proposal is a real help and guide in the future months of work. My experience as a supervisor is that the tougher I have been on students concerning their research proposal, the easier it is for them to finish and to finish well.

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CHAPTER 4
THESIS STRUCTURE

Layout of chapters

This chapter should be read with Chapter 17 in which detailed criteria are set out for Masters and PhD theses.

Overall structure of a thesis

Preliminaries
Chapter 1. Introduction
Chapter 2. Literature review
Chapter 3. Methods
Chapter 4. Results
Chapter 5. Discussion
Chapter 6. Conclusions
References
Appendixes

1. **The preliminaries. Follow this sequence. See later for details.**

   Title page

   This must include the name of the university, the title of the thesis, your name, your supervisor's name, and the following statement: "Dissertation submitted in partial fulfilment of the requirements for the degree of MA in English" or something similar, followed by the month and year of submission.

   Abstract

   This should follow the normal patterns, such as that which is explained later, following Swales' Create a Research

Space model. You should restrict yourself to one page. See Chapter 5 for more details.

Acknowledgements

These should be kept to a minimum and not exceed one page. They should also be calm, factual, and unemotional.

Glossary (if needed)

Table of Contents ie this is one continuous list of the following:

1. List of the preliminaries
2. List of Chapters, in reasonable detail
3. List of the Appendices. NB they belong here, NOT separately, and NOT after the list of tables etc.

List of Tables

List of Figures

Note that it is customary to provide a separate list of Tables and a separate list of Figures, and these lists should begin on a new page.

Some authors do not make a difference between a ‘table’ and a ‘figure’ and use only one word ‘figure’. I find this highly convenient, and have followed this helpful style in this book, but check with your supervisor before doing this.

NB. The pages of the preliminaries should be numbered with small roman numerals, placed in the centre, at the bottom of the page.

2. Chapters 1 and 2: Introduction and Literature review

There should always be an introduction, in the standard format explained in Chapter 5. The introduction is usually one of the last chapters that is written in a thesis, since you cannot really introduce a thesis that has not yet been finalised!

In a MA thesis there is usually only one literature review chapter, but in a PhD thesis there could be several chapters especially when the thesis is cross-subject. The literature review should end with the research questions, which may well be a separate chapter in a PhD thesis.

NB: These chapters should be heavily referenced, but quotations should be rare.

3. **Chapter 3: Methods**
What you did, and the procedures (methods) you used. In describing the procedures, if they are standard ones like questionnaires, then you will need to reference textbooks and articles. Of course, not all research involves a questionnaire therefore references are not always needed. In some theses this is the shortest section, but in others it can be huge and involve a considerable discussion and evaluation of various methods and justification of the choices you made. In a MA it is always one chapter, but in a PhD it can be more. Some students seem to think that research in linguistics will always involve interviews and questionnaires, but this is not at all the case as they could see if they read some research articles.

4. **Chapters 3-5: Results Discussion and Conclusions**

Results. Usually as large as/larger than the literature review. The salient (most important) facts should be presented and evaluated. Your opinions should be kept to a minimum. **The raw data belongs to appendices**, but MUST be referred to in the body of the thesis. The material presented in this chapter should directly answer your research questions. References are rare in these chapters.

A common desire is to present the results by the method used. Eg the results of a questionnaire are presented, then the results of the interview. Much better is to **arrange the results by research question/hypothesis, and to integrate the findings from the different methods**. This is similar to the literature review which reviews the arguments rather than summarises and comments on a chain of references.

Discussion. The main results need highlighting, with an evaluation of the significance. Compare them to other authors, writers, and theories. What new knowledge do you now have? What are the implications? Sometimes new references are introduced but usually there is a comparison of your findings with those in the literature.

> **Two options:**
> Results WITH discussion,
> **OR**
> Separate Results chapter(s) and then Discussion chapter(s)
>
> The choice is for you. Either present results with commentary immediately after each result, and at the end present some broader discussion points, OR strictly separate the results from the discussion. The classical way is to separate the results chapter(s) from the discussion chapter(s). The results chapter(s) are therefore a presentation and explanation of the findings, with very little reference to the literature. In the discussion chapter(s) the findings are interpreted and related to the literature review.

Conclusions. This is the only chapter without headings. See Chapter 5 below.

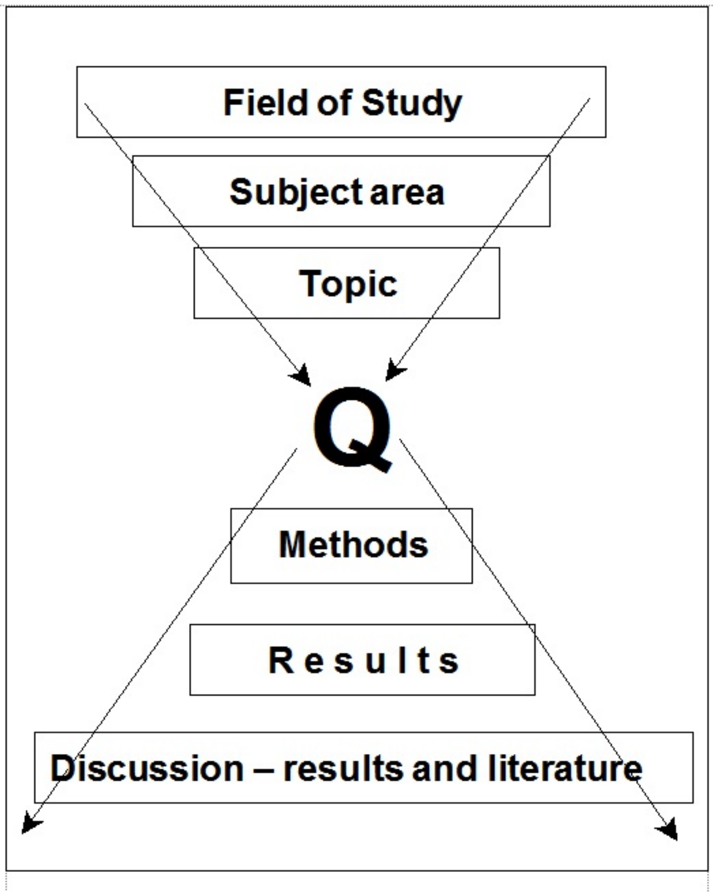
5. **End matter**

References. This means the actual works referred to in your thesis. In the MLA style it is permissible to have two lists, the 'Works cited' and the 'Works consulted'. (Gibaldi 1995:106). Sometimes it is hard to include many of the references a researcher has consulted, but does not directly quote or refer to in the thesis. I suggest that the technique be used of making a point with the main reference, followed by "see also ...." in order to include them.

Appendices. Here should go the raw data, and things like exact copies of the questionnaire used. Here is also the place to tidy up any loose ends that could not be dealt with in a footnote. Appendices are usually single spaced, in a smaller font (eg 10 point).

6. A visual picture

Figure 4.1, a visual picture of the thesis structure and argument



The visual picture below may help you to see the structure of a thesis. Notice the process of narrowing down to the research question, followed by a broadening out as the results are presented then interpreted in the light of the literature.

Compare this with Figure 11.1 which shows the order of writing the thesis, beginning with the centre and working outwards.

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CHAPTER 5
THE ABSTRACT, INTRODUCTION AND CONCLUSIONS

A. Introduction

The Abstract, Introduction, and Conclusions, are written right at the end of writing a thesis. There are significant similarities between them. All of them summarise the thesis. The Abstract is extremely short, and gives a summary of the whole thesis. The Introduction concentrates on the foundations of the thesis with an emphasis on why the thesis was written followed by a brief, stylised introduction to the sequence of chapters and how the thesis will develop. The perspective is always towards the future. The Conclusions summarise what has been achieved in the light of the literature. As such, the perspective has changed from that in the Introduction, from a futuristic view to that of a balanced statement of what has been achieved. In the Conclusions there is also a summary of the limitations, and some suggestions for further work.

The advice below is very brief, but contains all you need to know. It is worth reading slowly. Much of it is based on Chivers (no date).

B. The Abstract

1. Introduction

This should be one of the last items to be written, and should not usually exceed a page in length. Though Abstract formats do vary, you cannot go far wrong if you follow the framework that Swales (1990) observed.

a. Summarise the topic area, the field, the opposing viewpoints, ie put your work in context.
b. Establish where there is a gap, something new that needs to be done. This gap is sometimes called your 'niche'.
c. Show how you filled this gap and what your findings showed, and the implications.

2. Example: Abstract of an article (taken from Lowe 1996:217)

Abstract

The symbols and other 'non-verbal' devices of science are commonly assumed to be international.

I tested this assumption for the French and English languages at the pre-university level of science. The setting was two pilot schools in Tunis, one of which taught an accelerated Tunisian curriculum in French, and the other taught the identical curricula in English. The results were surprisingly unambiguous. There was total correspondence only for the symbols of the elements and the symbols for amino acids. Differences were found in the areas of numbers, the ways of writing equations, the indications of scale on graphs, symbols in chemistry, and the symbols for trigonometry.

Some reasons for the differences are considered, along with a discussion of the factors influencing standardisation. It is helpful for ESP teachers to know where constancy exists, and to be able to point out differences to students.

Practice. In order to see this, students are advised to take the three steps mentioned in the introduction, and find them in the abstract provided.

3. **An abstract is NOT an introduction, though there are many similarities**

   To make this clear, I include below the actual introduction to the same text above. Notice the following similarities and differences.

   a. The article introduction is much heavier with references.
   b. The article introduction does NOT report on the findings or go into detail on the methods or implications.
   c. The article introduction expands both the context, and the need for the research.

Introduction

It is commonly assumed by teachers of ESP that the language of science is 'international' (Richards 1976, p x, Strevens 1977:153) or 'universal' (Widdowson 1979:23,110). This applies particularly to symbols, and other "non-verbal devices" (Widdowson 1975:7) such as "formulae and graphs", (Robinson 1980:24) or "equations diagrams and models of chemical compounds" (Widdowson 1979:24). Widdowson sees the non-verbals as being a type of interlanguage, which, he reasons, is universal, because they are drawn from a "universally accepted set of conventions" (1979:24 see 1975:7). Wilson regards mathematics as particularly culture free (Wilson 1981:29,32), though he does recognise that differences exist in science.

Little attempt has been made to support such assumptions with hard evidence. The assumption undoubtedly reflects the fact that most ESP teachers do not have a background in science, and also reveals a certain idealism about the nature of science itself, which is supposedly characterised by impersonality and neutrality (Widdowson 1974:288-9; 1979:110).

Despite recognition that there are differences between languages, (Ewer 1971:68, Strevens 1977:153) there has been very little followup research. In particular, there has been little systematic attempt to compare different language pairs, and to study different science subjects, notable exceptions for French and English being Maillot (1981) and Défourneaux (1980, 1983).

Teachers have the general impression that the differences can safely be ignored and left to the students to master, despite knowing a few of the differences that exist such as the punctuation of numbers, and being aware that sometimes specialist vocabulary and symbols differ between the languages.

What teachers and students need to know, is where similarity can safely be assumed, and where it cannot. This paper attempts to do that for a comparison of non-verbals of science in English and French at pre-university level. The level of science is that which is accessible to even Arts trained teachers of English, and is the common background of all French speaking science students who are learners of English no matter what their subsequent speciality. Also, given that differences exist between French and English, the question needs to be asked if there are differences between other pairs of languages. References to this are scarce, though Maillot (1981) does give examples from German and Russian as well as French and English.

The research reported here was carried out in an unusual context: that of a pilot English medium school in Tunisia required to teach a French based science curriculum in English. The pilot scheme deserves a paper in its own right. The importance of the context for this article is that the science and mathematics teachers were expected to use a language of science in English that was as close as possible to the language of science used in French. This expectation meant that the teachers became highly sensitive to differences, a sensitivity which greatly facilitated their identification and analysis, and gave them some significance: the differences were important because they influenced both the actual choice of the language of science used in the classroom, and the choice of language used in the translations of the textbooks. The differences were not found simply by comparing textbooks or dictionaries. In addition to the non-verbal devices reported here, differences for units, electronic symbols, long division, and genetics were found, and differences were documented for verbal expressions such as definitions, faux amis, eponyms, affixes, and taxonomy. The significance to the pupils of some of the differences was also studied. (Lowe 1992).

Again, the example can with profit be studied by applying the three part framework and seeing how closely it fits.

4. **Example of an alternative style**

   The three stage framework is not the only one possible. Another framework is illustrated below. It comes from my thesis, and was written *before* I knew about Swales, and before I had studied discourse analysis. As such it represents a style that I had learned without receiving any formal instruction, and without being consciously aware of the linguistic pattern. With hindsight it is quite clear that I had simply used the experimental report format, which I had been taught since my first year at grammar school (seven years before the Baccalaureate) and had in turn taught other students when I later became a science teacher. This is the famous format of Introduction, Methods, Results, and Conclusions (IMRC or IMRAD: Introduction, Methods, Results, And Discussion). Notice that I also included keywords, since these were used in the days before computers were common to aid the indexing process.

ABSTRACT

KEYWORDS: scientific language, French, English, English for Special Purposes (ESP), baccalaureate, Tunisia.

In 1983 two pilot schools in Tunis began teaching sciences and mathematics, one through French, the other through English, but based on the French curriculum and textbooks. The content and language of science was assumed to be similar: only the host language changed.

In the pilot schools, physics, chemistry, and biology lessons were observed, set textbooks and their translations were compared, teachers' meetings attended, and sixth year pupils were tested. The validity of the assumption that scientific language is similar in French and English was assessed, and some of the consequences explored. The work was restricted to communication through words and non-verbals such as symbols.

The results show that the assumption is only fully valid for the symbols of the elements and amino acids, and the SI system of units. Scientific language is not necessarily constant between French and English.

Implications are drawn for linguistics and for the teaching of English to students of science: the differences cannot be ignored, as many of them are fundamental ones. (Lowe 1992: Abstract)

As an exercise, try applying the three steps framework. Then try applying the "Introduction, Methods, Results, and Conclusions" framework to the Abstract above.

In the next section the introduction from the same thesis will be discussed, and the contrasts between the abstract and the introduction can be clearly seen.

C. The introduction

Advice: Read this section slowly. It is quite dense and contains all the advice you need.

1. **An introduction** should place the thesis in context, present the problem considered, explain how you propose to present your work, and guide the reader through the thesis.

   Crucial to writing the introduction is to **consider who the reader will be.** You should think of an MA student who is NOT a specialist in your field. I actually wrote my own doctoral thesis imagining several people who were not academics at all, and who were certainly not specialised in my subject. Firstly, I pictured a bright sixteen year old in Britain. Secondly, a bright sixteen year old Tunisian, possibly one of the students in the schools I studied. Thirdly, a good non-native speaker of English. This simple method of imagining the reader greatly helps to improve the clarity of your writing at all levels, from the overall organisation, through sentence structure, to the choice of words.

   The introduction begins by an exercise in placing your work in context. There are several contexts: the discipline(s), the main theories, the main subjects in the discipline, and the various possible methods. **The research question** must then be identified quickly and briefly, with some indication as to why it is worth studying, within the contexts already outlined.

   A **summary of the methods used** to answer the questions then follows. The main types of results obtained need to be summarised, in maybe just a few lines, followed by some initial indications of the significance of the results.

   After reading the introduction, the reader should have been drawn from their knowledge of the subject into thinking about the focus of the thesis, and be convinced that it is interesting and worth studying. The reader will also have some idea of how the question was considered, and will have a guide to the rest of the thesis, and have some idea of the new contribution made by the student to the existing knowledge.

Introductions, by their vary nature, are short (only five pages), and introductions to a PhD can be as short as those for MA theses.

2. Example: Lowe 1992, Introduction

I include below the introduction from my own thesis. I have added my commentary. In transferring to the format of this book some of the original formatting has been lost, but the concise sequencing of ideas following the guidelines of Chivers (nd) given above should be obvious. Many students, myself included, find careful study of a good example of the style we want to emulate is better than trying to follow rules. I hope this example will therefore help other students.

1. SUMMARY OF THE BACKGROUND TO THE THESIS
One of the aims of the Department of Educational Studies at the University of Surrey is to do research into cross cultural differences and approaches in the understanding of science, as taught in schools. The context of the two pilot schools in Tunisia provided a setting in which this aim could be pursued. In one of these two schools, the 'English school', a French based curriculum in science and mathematics was taught in English to Tunisian pupils, while the comparable 'French school' taught science and mathematics in French.

Commentary. Notice how I quickly I stated the context of the thesis. I did not write a long essay about cross cultural linguistics or ESP as many of my students would be tempted to do. In one paragraph I united the research aims of my department with the field situation where I did my research.

The assumption made in the English school was that science was the same in English and French, that is if someone spoke and wrote English and French well, there would be no difficulty switching languages when studying science. [1.] Scientific language, both non-verbals such as symbols and equations and the verbals, such as definitions and terminologies was assumed to be constant between English and French and to be independent of the host language.

-------------------[Footnote in original text]--------------------

1. The meaning of 'sameness' is defined in Chapter 3 'Basic terminology Section 2 'Constancy'.

Commentary. Notice how I forward referenced the concept of 'sameness' to the chapters in my thesis where this key concept is explained. I used a footnote to do this forward referencing. Since the Introduction was one of the last chapters to be written, this forward referencing was easy to do. It also says to the reader - wait: I will explain this term later, and if you want to look now you can do so.

2. THE TUNISIAN SITUATION

Tunisia's Education system broadly follows that of France, with the major difference that instead of all the education being in French, two languages are involved, Arabic and French. After six years in primary school of mainly Arabic but including a considerable amount of French, pupils take an examination, the sixième , which is comparable to the old 11+ examination in England. Those who succeed go to a Lycée (like a grammar school) leading, seven years later, to the baccalaureate. [1.] Throughout the lycée the sciences and mathematics are taught in French.
-----------------[footnote in original text---------------------
1. Note in France, the 'middle school' system is now used, and the word lycée strictly speaking applies to the last four years of secondary education. In Tunisia the word is used to mean secondary education from the sixième to the baccalaureate.

In 1983 two experimental grammar schools (lycées pilotes) were set up, with pupils recruited from those with the best results in the sixième . In one of the schools, the English school, the sciences were taught in English not in French. The British Council were involved in retraining Tunisian science teachers to teach in English, sending them to Britain for a year, initially to Leicester University, then later to Bristol University and arranging refresher courses for them in the summer. The British Council also provided books and helped to recruit British teachers from 1986-1990.

From the beginning it was envisaged that the most successful students would go on to English speaking universities for their degrees. (Lycée Ariana 1984) Those that could not get a grant for this, would return to the French language system of Tunisia. To this end students had to continue studying the French language while at school, and it was assumed that the students would have little difficulty changing back to French since scientific language was assumed to be constant.

The lycées pilotes had an accelerated science curriculum compared to other Tunisian lycées, and drawing from the same pool of pupils, the two schools were broadly parallel in their curricula, which gave a good basis for research comparing science in French with science in English. The only important difference between the two schools was supposed to be the language in which sciences and mathematics were taught. The teachers at the English school were obliged to follow as closely as possible the Tunisian curriculum and ways of teaching.

In the field situation then the assumption was held that science, and specifically, scientific language, is the same in English and in French. The field situation also provided propitious circumstances for testing this assumption.

Commentary. Here I expanded on the Tunisian situation referred to in the first paragraph, leading almost imperceptibly to the research questions. I did so partly because it was a context expected to be unknown to my readers. Again, I do not write a long essay. Instead, in swift broad strokes I paint in the main points.

3. OUTLINE OF THE METHODS USED

The research was conducted over the school years 1986-1989. In 1986-87 British teachers at the English school were interviewed regularly. Classes of biology were observed in 1987-88, concentrating on the most advanced year, which was newest to the teachers and was where translation of textbooks was being done, and the tensions of teaching a French curriculum in English were most real and most frequently talked about. In 1988-1989 classes of physics and chemistry were studied, partly because of teachers had informed me of major differences meriting study, and partly because here the theory could receive a more thorough testing in the areas of symbols, equations and chemical formulae. Towards the end of the school year 1988-89 several tests were given to the pupils to assess the significance for the pupils of some of the differences found, and to study for instance how well they were able to cope with them. My length of stay in the schools helped me to win the confidence of the teachers. I functioned in the lessons as a 'participant observer', and, at the request of the Headmistress of the English school, I attended departmental teachers meetings. I had access to all the translated material. My frequent presence in the school meant I was often present when a new teaching difficulty or translation point was being discussed. I also had opportunity to question the teachers, and to obtain invaluable textbooks and translations.

Commentary. The above paragraph must be one of the longest I have ever written! Unlike many of my students I believe strongly in short paragraphs and plentiful headings. The goal is to make reading easy, pleasurable, and clear. But there is a carefully crafted concise progression of ideas. Think. Where would YOU break the paragraph?

4. CONSTRAINTS
The notion of CSL, Constancy of Scientific Language, is too big to investigate at all levels. I have therefore restricted the thesis to non-verbal and verbal communication. Also, because the theory is not spelt out in detail, I have first identified several areas where CSL might reasonably be expected to be valid. These are for the verbals:faux amis, definitions, linkwords, prefixes and suffixes, abbreviations, eponymes, diseases, taxonomy, and chemical terminology (Section III Chapters 8-18); and the non verbals: symbols, indices, equations, and miscellaneous (Section IV Chapters 19-24). The questionnaire results are discussed in Chapter 8 (faux amis), 18 (chemistry), 23 (physics), and 24 (student opinions).

It was necessary to clarify the terminology used to describe language in science, in particular that 'scientific language' refers to both words used exclusively in science, and common words which have a science specific meaning. (See Chapter 3 'Basic Terminology').

In each topic area, the sub-hypotheses were formulated in response to the question: if scientific language is constant what would one expect to find, what would be the consequences and wherever possible how could the material available best be used to test this. Material used to test the sub-hypotheses was collated from several areas, including lesson observation, a study of the textbooks and use of reference books and other literature.

To my knowledge, no one has ever before documented where scientific language at baccalaureate level differs when the host language is changed between English and French, and to what extent there is constancy in scientific language at this pre-university level.

Commentary. This section on the constraints looks rather unusual. Surely it belongs as a section in the conclusions entitled "limitations of the research"? Actually, it plays an important role in specifying how the subject area was narrowed down, and how the sub-hypotheses were formulated.

5. FINDINGS
The differences between science in English and in French are classified and discussed in Section III 'Verbals' (Chapters 8-18) and Section IV 'Non

verbals' (Chapters 19-24). It has been found that for only a very few linguistic features such as the symbols of the elements is scientific language completely constant between French and English. Most of the time the assumption was found to be only partly tenable and sometimes it was found to be completely untenable.

In Section V, After a results summary (Chapter 25) and a discussion of the validity and reliability of the results (Chapter 26), the questions as to why CSL is not always valid, and the forces acting for and against the constancy of the language of science are discussed (Chapter 27). Finally, some of the implications of the research findings for linguistics (Chapter 28), and for the teaching of English as a foreign language to science students (Chapter 29) are considered and the broad conclusions are stated in Chapter 30.

Commentary. Here I outlined the sequence of chapters, and made an initial justification of the originality of the work.

D. The Conclusions

1. People read theses twice!

a. The first read

Think again of the reader. Commonly people on their FIRST read proceed in this order:

1. Title
2. Abstract
3. Introduction
4. Conclusions

b. The second read

Only on the second read will most skilled readers read in detail, and even then they may well jump around, and expect to be able to follow it from the mild repetition and cohesion devices included in a thesis.

c. What then should someone remember after their second read?

Details will fade from memory (except the mistakes they have noticed!), but after reading a thesis there should be:

1. A clear idea of the topic discussed
2. A grasp of the structure, and the major points made
3. New ideas and perspectives.

That list of reader expectations gives you the outline for your conclusions.

2. How to write the Conclusions

Firstly you need to briefly re-state the original problem, in the context not of the case for the significance of the problem (as argued in the introduction) but in the context of the potential benefits of having solved the problem. This change of perspective is often subtle, but is valuable evidence of the progress made by the student in doing the research.

Secondly, the conclusions answer the question as to what has been achieved. The balanced presentation of achievement, avoiding both extravagance and undue modesty is a real sign of maturity.

Thirdly, it is quite common to include a reminder of the limitations of the research.

Finally, research generates new questions, so this chapter must consider – very briefly – the most appropriate avenues for future work. The bland statement that further research is needed should be avoided by being more specific and providing brief justification. On the other hand, **many students at this point write an essay of unsubstantiated arrogant opinion. All the recommendations must be directly rooted in the thesis you have just written.** There must NOT be any new ideas or new material. It is better to be modest and conservative than to exaggerate and present a series of broad unsubstantiated opinions.

Lowe I 2016a. A first textbook of research methodology and thesis writeup for second language English speakers. www.scientificlanguage.com Version 1.1

CHAPTER 6
THE BODY OF THE THESIS

A. General comments

1. Thesis sections

The body of the thesis comprises the literature review, the methods, the results, and the discussion sections. I insist on this: the body of the thesis is divided into sections. Within each section there may be one chapter, or several chapters.

Be aware that some supervisors and examiners expect a thesis to show 'balance' ie they are expecting the literature review to be a similar length to the discussion, and that each chapter will be substantial. Other supervisors like myself argue that content determines chapter length.

Some theses by their nature are longer or shorter than others. For some theses there is a huge literature to review and for others it is very limited. For some theses the methods section is long, and needs sub-dividing into several chapters. For instance, in my own PhD thesis, the Results section was three chapters:

- Theoretical principles 18 pages
- The methods I used 25 pages
- The cornerstone hypotheses 2 pages

For other theses, the methods might be only a few pages.

What matters is NOT artificial expectations of length. What matters is clear presentation with a readable line of argument. The actual structure is incredibly flexible, and it is the content itself which is decisive and determinant.

2. **The thesis thread**

One of the biggest problems students have is to explain their thesis and maintain it as the coherent thread which upon which the work hangs. "A thesis in this sense is something that you wish to argue, a position that you wish to maintain" (Phillips & Pugh 1987:38). Your work must have a story line. Initially, you narrow down, through the literature review, then you widen out in the discussion.

Think of a novel – the most interesting gripping novel that you can think of. The novel is gripping for several reasons. It may be the character development, or the plays on words. Adventure thrillers allow readers to see how the characters respond to danger or problems.

It is possible for a thesis to be a ‘good read’. Research is all about discovering something new, and presenting the journey in an attractive gripping way. A reader is gripped when the questions are clear and interesting, and the reader wants to read more. How did the writer get into this subject? How did they develop the questions? What relationship do the questions have to existing knowledge and ideas and viewpoints? Significantly, what is there that is NEW in this thesis? And how have they developed theory?

Figure 6.1 A novel and a thesis compared

Novel	Thesis	Commentary
Well told, gripping story		In a thesis the end is known at the beginning – it appears in the Abstract
A novel usually uses a timeline, with the difficulty of handling several groups of characters and events sequentially.	A thesis can use a timeline, especially when reviewing the development of a subject or argument. The difficulty is in handling several parallel ideas and presenting them sequentially.	
Line of narration	Line of argument	Both tell a story!
The thread is visible at all times. The reader always knows where they are on the thread.		
Headings are rare	Headings dominate: they are the main indicator of structure and thread	
Usually read from the beginning to the end	Usually read backwards, or selective reading on more than one occasion	
Informal language probable	Interesting formal 'academic' language is *de rigeur*	Academic language is not necessarily boring! There are thousands of poor quality boring novels.

3. **The difference between a Masters and a Doctorate**
A doctorate is of sufficient quality and length that it can be published in whole or in part. While a few MA theses could possibly be published (after sufficient extra work) this is not the aim of an MA thesis. An MA thesis concentrates on a very tiny question, therefore the thesis need not be very long. A doctoral thesis may take the same question and go into it in more depth, or consider more variables, or collect more data. As a consequence, the thesis will be longer. Also, a doctoral student is expected to provide a thorough survey of the relevant literature presented in a tightly argued way, whereas more tolerance is given to an MA thesis. See also Chapter 17.

In an MA, a student learns and practices some of the tools of research, and learns to write a thesis that conforms to the norms of the genre. There is more tolerance of mistakes, especially mistakes of methodology. All MA theses should be written in perfect English, and should be error free in terms of punctuation, layout, and referencing. But beyond this, the standards are a little lower. The literature review for instance is considerably shorter by nature of the work done.

In experimental work, a small sample may well be acceptable in an MA, whereas a doctoral student would be encouraged to collect more data. It should go without saying that the MA student should know, and state, the limitations of the small sample.

An MA thesis usually does not tackle a theoretical question since theory is a difficult area, and modifying theories is the work of doctoral or post doctoral researchers.

A PhD is not just the collection and presentation of new data. It is also progress in the testing and extension of theory. Theory in this context is a broad word and can be a framework, a model, a classification or an approach. In addition, it MUST be publishable in whole or in part.

B. The literature review

1. The main parts of a literature review

You need to show knowledge of:

- the discipline
- the topic
- the theories
- the leading players/authorities.

All these need to be politely evaluated and linked together. You need to show that you know the strengths and weaknesses, and that you have mastered the craft of polite criticism.

You need to **summarise, critically, and constantly** show the relevance to your question.

2. Quotations are rare. NB NB!

Quotations should be rare and follow the norms of quotation both in form and necessity. This is worth repeating since many students somehow do not feel safe unless they string together a series of quotations. The following point should be well known: a quotation is rare, and is only used when the form of words is as important as the content. A quotation should only be considered when BOTH requirements are met. It is not enough that the quotation expresses what you want to say – a referenced paraphrase will do that.

If students find this hard to believe, then I challenge them to read some of the longer research articles in their discipline, and notice how often these skilled professional writers use quotations, and why they use them.

3. **Voice, synthesis, and critical selectivity - NOT essays**
   Many students write a literature review as if they were writing an essay or a textbook. It is hard to explain the difference but I will try.

   Firstly, a literature review is **not a textbook**: it is NOT a summary of existing knowledge. **It is a critical synthesizing presentation of the relevant background to your own research**.

   Secondly, the literature review must be **heavily and pedantically referenced**. Every idea that is not general knowledge, or not your own, MUST be referenced. And this referencing must be mostly recent high quality credible sources.

   Sometimes it will not always be clear if a reference should be provided or not. What is general knowledge for a linguist is not general knowledge for a historian. Both will know what 'primary sources' are and this term needs no reference, but when a historian writes about 'Code Switching' they will need to provide a brief explanation and references whereas a linguist can assume that the term is known. On the other hand, in a thesis on linguistics the reader needs to know the author's viewpoint and position on 'Code Switching' and 'Code Mixing' and other nuances, and these should be explained, with references. There always will be a grey area. But the fact that grey areas exist does not in any way contradict the point that every idea that is not your own, or not general knowledge, MUST be referenced. It is better to over-reference than to under-reference.

   Thirdly, a literature review is **not simply a presentation with commentary of several major references**. **A literature review is an argument backed by the literature**. This argument must focus on and look forward to the research questions. The argument you make summarises and comments on the views of others, and critically untangles the reasoning in the foundations and points to the questions. The literature is merely the clothing for the story – a line of argument rather than a line of narration.

> **The 'literature review' is the wrong name. It should be called the 'argument review' ie an argument which is critical of and supported by the literature.**

Fourthly, be willing to use a red pen on your own work and **delete superfluous material**. There should be great selectivity and great economy of words.

Fifthly, you should constantly ask yourself, why am I saying this? What **relevance** does it have to my thesis? A good writer knows how to use the red pen on their thesis, how to summarise, how to link ideas (and accompanying references) together, and, in particular, knows how to be selective. Only relevant argument (and accompanying literature) is included.

> **Relevance –unfortunately not a joke**
> Some linguistics students, hearing my constant stress on 'relevance' thought that I meant usefulness and applicability of their thesis to other language teachers!
>
> Relevance is to the thesis and argument.

Sixthly, the argument should show what the writer thinks. In other words, we should be able to see that **the writer has a voice**, a personal argument, a case that they want to present and defend.

In fact, that is what a thesis is – a well developed argument which the writer presents and defends, showing mastery of the conventions of research and thesis writing. The writer is arguing their case just as much as if they were in a public debate. This arguing happens politely, with fair summary of different viewpoints, following conventions of presentation, but it is still personal, and is distinctive.

4. **The art of gentle criticism**
   One area that many students find a problem with, especially in the literature review, is the idea that they should be academically critical of their sources. It may help students to think of themselves as apprentice members of the research community. **One test of the membership is their ability to fairly assess their future research peers.**

   Gentle criticism means just that: you are not there to score points against an opponent in a verbal boxing match. Any errors you notice should be factually and dispassionately noted. If you notice an error of fact, grammar, or spelling for instance, you can add the words [sic] in square brackets, as mentioned in Figure 10.1. If the error is greater than that, it can be explained in a footnote, or labelled as an unfortunate mistake.

   I remember being very annoyed and critical of Professor HG Widdowson. I viewed his factual error concerning chemistry as an elementary school level mistake, which it was. In addition, since all books that are published are edited by someone, there were two people at fault for making this error. On the advice of my supervisor, first of all, after concisely explaining the error, I made the criticism less important by relegating my comments to a footnote. Secondly, I excused the error, and trivialised it. I said, "The error is unfortunate, and in no way detracts from the point he is making" (Lowe 1992 page 28.4).

   How can gentle criticism be learned? I advise students to read carefully the literature reviews of articles. Look at contentious subjects! Also, look at review articles, which are there to point out the weaknesses of others.

5. **Voice**
   Some students find it difficult to develop their own personality in print. We see this for instance when there are endless quotations. Quite apart from the rule (quotations must be rare) there is the whole question as to why students feel the need to use quotations, and the reason can be that they are afraid to stick their necks out and really say what they want to say. Yet,

examiners are looking for the quiet tactful but firm ‘voice’. In a thesis you are making an argument, you are making your case. You are showing the basis, and to some extent anticipating and covering objections. It is your choice how to make that case. You are in charge.

6. **Narrowing**
   Just as in stating hypotheses there is a narrowing down process, so too in the literature review (and in miniature, in the Abstract and the Introduction) there is a narrowing process. You begin by briefly summarising the subject area, then, using the cohesion devices of explanation and justification, you narrow somewhat and expand on a small area. This in turn, again with the cohesion devices of explanation and justification, you select one small area to focus on.

   You may in fact have to do this for two or more sub-topics. In which case you will need to combine this with point 8 below, coping with parallel ideas.

Figure 6.2 To illustrate the narrowing process

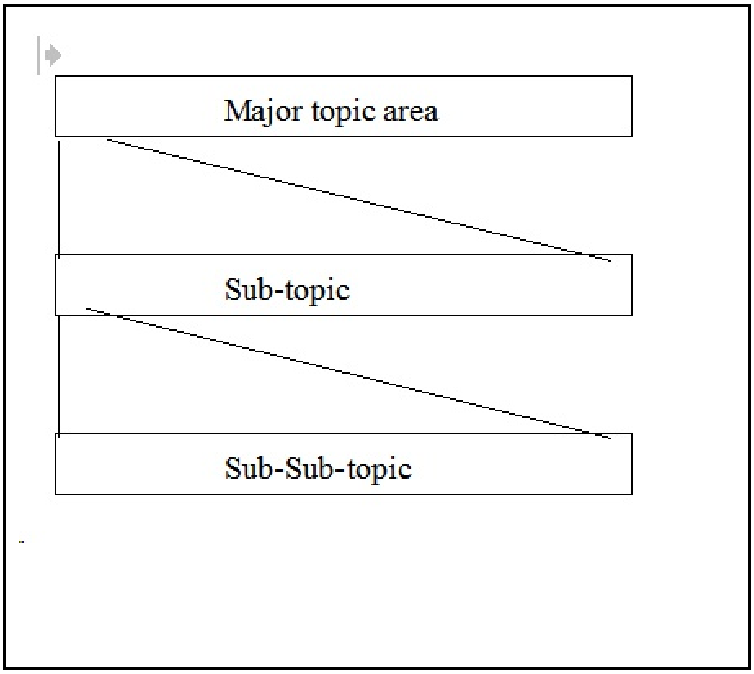

Figure 6.2 shows how you start with the major topic area, focus on one small part of it then expand your review of this small area. You may have to do this several times.

7. **Solutions**
   - Use a clear, extremely detailed, balanced system of headings going down to several levels. The discipline of imposing headings and structuring the work under them will improve the thread of a thesis.
   - Immerse yourself in good examples of the genre. This means reading carefully and analytically many of the literature reviews in the relevant journals.

8. **Maintain an obvious thread**
   Skilled experienced readers of theses rarely begin at the beginning and read to the end. They frequently read only some of the thesis and begin in the middle or the end. In a good thesis, the reader can pick up the document at any part and understand what is going on. This is possible because of:
   - Clear, reasonable, predictable headings
   - Constant explicit relevance
   - Cohesion statements – either sentences and paragraphs – at the beginning and end of each major section which summarise what has just happened and signals what is to be presented.

The thread must be obvious at all times. This is easier once the writer is selective. You move from the broad to the detail. You are like someone who surveys the territory, and steadily narrows the focus.

Sidetracks should be dealt with speedily, and pointedly. You must not allow them to distract you. At the same time, you must show that you know the main points within each sidetrack. You could do this by judicious use of footnotes for instance.

At the end of the literature review there should be a clear statement of a research question, which has been placed in context.

7. **Foreground the research question**
   In far too many theses I have read, the writer seems to want to hide the research question from the reader, rather like a writer of detective fiction who wishes to hide the identity of the murderer until the last chapter, or, hide the identity entirely.

   The details of the question belong to the end of the literature review, or to part of the methods section. But the core question(s) should be clear, anywhere in the thesis, from the beginning to the end.

8. Coping when there are several distinct areas to review

a. **The problem**. It is quite common for someone to have two or more distinct areas of literature to review. A 'Needs Analysis' of managers for the National Bus Company, would need to summarise the vast literature on Needs Analysis, and report on the history and present structure of the company. Each area needed separate discussion, without losing the thread.

   But a thesis is written in a straight line. How then can parallel areas be reviewed sequentially? It is like a novel when there the characters split into several groups and are all doing things at the same time, but only one group can be described at once.

   As always, the best way to learn this is probably to notice how good published writers do it.

b. **The solution - cohesive devices**
   1) In the introduction, state the problem, and outline how you will solve it by the way you arrange your chapters.
   2) In each of these chapters, begin by stating what the previous chapter did, and what you intend to do

now in this chapter. At the end, summarise what you have achieved, and what you will need to do in the next.

c. Example

In Chapter 5 I have included large parts of the introduction to my thesis -- you can see from that how the matter was partly solved there. In fact, I had three parallel areas:

The situation in Tunisia	Basic linguistic terminology	The language of science

All three areas directly concerned my research questions, and all three were independent and distinct areas to be reviewed. Therefore I began chapter 1 with the following introduction.

> This chapter introduces the Tunisian situation and the pilot schools, as the context in which the assumption that scientific language is constant was studied. For general references on Tunisia and the education system see Appendix 17.

Notice how direct and to the point this introduction is! It states exactly why the chapter is needed in relation to the thesis question. Notice also how the needed, but sidetracking tangential detail, had been firmly relegated to an appendix, and the sidetrack was noted here, and speedily dealt with. At the end of the chapter I wrote the following:

> In the field situation, the theory that scientific language is constant (CSL) was an assumption which undergirded the whole pilot school in English project. The assumption was supported to varying degrees by several pressures to conform as closely as possible not only to the Tunisian curriculum but also to the French usage of language. CSL was an assumption held in a real teaching situation with real practical effects on the way science was taught.
>
> In the next chapter the terminology used to describe language used in science is presented, while in Chapter 4 there is a wider discussion of the various meanings of 'scientific language'.

In the above paragraphs the main points established in the chapter are stated, and there is forward referencing to the next chapter. The opening paragraph in the third chapter which follows is:

> As has been explained in the introduction and in Chapter 2 'The situation in Tunisia' scientific language was, in the English school, regarded as 'the same' or 'constant'. At no point though was 'scientific language' or 'constancy' ever defined by those involved in the English school. For the purposes of research a greater precision in these terms is required, which is what this chapter provides.

Here, it is clear that I first of all referred to the previous material and repeated what had been established. I then state the next gap to be covered, and explain why the chapter is needed. Notice how concise the paragraph is. The chapter is only a few pages long. I finished the chapter under the heading of Conclusions and stated:

> Constancy refers primarily to similar form and sense.
>
> A terminology has been established as in figure 3.4 in which 'scientific' words are in contrast to 'non-scientific' words. A 'scientific' term can be either the 'science specific' part of a mixed term, or a purely 'specialised' term. It is these 'scientific' words that were assumed to be constant between host languages, in particular, between the host languages of French and English.
>
> In the next chapter the subject of scientific language is discussed in more detail.

Notice the same pattern: a concise summary of what has been achieved so far, followed by forward referencing.

C. Methods

In your methods, you work in two areas:

1. Critically explain and review the methods you used. Use references to textbooks and articles on Research Methodology. Here you present the proposed methods of data collection and analysis.

2. Describe what you did, and why. You have to make many decisions when doing research. Here you need to defend your choice and implementation of your methods. The key is not so much which choice was made, rather, that you give your reasons for the choices you made. Basically, almost any choice of action is acceptable, provide you are up front about your decision making process.

   Here you explain what you did in the pilot study, and what changes you made as a result of the pilot. You might want to include a time-line: when you did what and where. If you started in one direction then found, as a consequence of the early research, you needed to change direction, then you summarise the problem, and explain the reasons for and against the different possible actions and why you chose the steps you took.

D. Results and discussion

1. **Organising the long results section**
The results section is usually the longest section in the thesis especially in a doctoral thesis. Therefore, presentation is crucial. There must be a coherent and obvious thread to the data presentation. I have read far too many theses where I have become totally lost, and even with my experience I found it almost impossible to grasp what the writer is saying.

Consider the option of dividing the results section into several chapters. In each chapter there will be a focus on one or more sub-hypotheses, and how well your data answers and tests these hypotheses.

It is particularly important that whenever the chapter becomes long that the system of headings and sub-headings is ultra-clear and consistent. For instance, in my own thesis, which was described by the examiners as 'concise', the 202 pages of the results were divided into 17 chapters. The longest was 34 pages, ten of them were less than 10 pages long, and one of them was only 2 pages long. Each results chapter had a standard and predictable sequence:

- Introduction
- Sub-hypotheses
- Results
- Discussion
- Sub-conclusions

Notice that I maintained a clear system of chapters, headings, and subheadings. Chapter length was irrelevant.

1. **Results then Discussion, or combined Results+Discussion?**
In some theses, particularly in Masters theses, it is possible to have one section in which results are presented and discussed. This is possible especially in the case where there are only a small number of hypotheses, and the evidence for and against them can be presented and discussed.

However, when there is one section, there will still be wider questions to discuss at the end. The distinction between results and discussion must be carefully maintained and signalled whenever there is just one section.

3. **The results is a presentation of the findings**
   Here you present your data, insofar as it tests the hypothesis, or answers your question. The raw data belongs to an appendix. Comment (other than explanatory notes) belongs to the discussion. Relevant data which is analysed and explained is presenting in the Results, and very few opinions are stated.

   Some students present the results like they write essays for the literature review. The hypotheses seem to be lost and totally forgotten, or revisited at the end as if they were a superfluous irritating compulsory afterthought. In reality, as elsewhere in the thesis, the hypotheses and argument are central.

   Data must be presented in a way that answers the questions or tests the hypotheses. It is argument that dominates, even through the mass of data.

4. **Inconvenient data**
   It is very tempting to alter or invent or selectively ignore data. Inconvenient data or facts must not be ignored. This is a particular problem with numerical data and the drawing of graphs. The normal approach is to be 'up front' about failures and inconsistencies. Here are some possible solutions:
   a. Explain and account for the inconvenient findings
   b. Highlight the data as being unexplained, thus perhaps needing further research.

5. Phrases

. . the results are inconclusive .

. . the data is against the sub-hypothesis

. . the data is incomplete, therefore no conclusions can be drawn.

. . the results are broadly in line with the hypothesis

6. The discussion

In the discussion you now widen out and go from the detail to the broad. You compare your results with the literature, and show how they add to the existing knowledge.

Foundational to the discussion is an appreciation of validity and reliability (Chapter 25). Some theses would benefit from a chapter or section addressing these issues explicitly and thoroughly. Even when they are NOT explicitly discussed the concepts are there, they are foundational, and they must heavily influence the discussion.

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CHAPTER 7
THE PAGE AND HEADINGS

A. The page

1. Introduction

All students should work through this chapter at a very early stage. In this chapter you will learn the importance of setting standards for page layout. In this way you will gain time and reduce your effort when you come to write a thesis.

Many of the page settings can be preset within a word processor. This means that right at the beginning of writing a thesis the student should think carefully about page layout and styles. Some students use the paragraph styles feature very successfully. It is not within the scope of this book to explain how to do this, but since the reader is probably a researcher, by now they will be used to finding out such information for themselves. The skilled researcher either knows how to get expert help, or they find out and teach themselves from the web – including videos – and through discovery and experimentation.

Setting up the page, with styles, will be a huge time saver for the future.

Setting up the page, with styles, will be a huge time saver for the future. For instance, before starting the editing of this book I established what I called and labelled a 'template' file with the margin, page numbering, headings, tabulations, and paragraph styles. It was a simple matter to begin each new chapter by opening the template file, and re-saving it with a new chapter header.

Be aware that if you change your mind later, you will have to alter all the work previously done, and this takes a lot of time and effort and great attention to detail.

It is worthwhile experimenting with the first chapter, establishing patterns, then sticking to them throughout the thesis.

- One chapter = one file.
- Begin revisions by making a copy of the file
- Email to yourself the files, as your backup.

2. Margins for a thesis

I suggest the following, which works well:

Left: 3cm	Right:	2cm
Top: 1cm	Bottom:	1cm.

NB, if need be for a diagram or table, these guidelines can be changed.

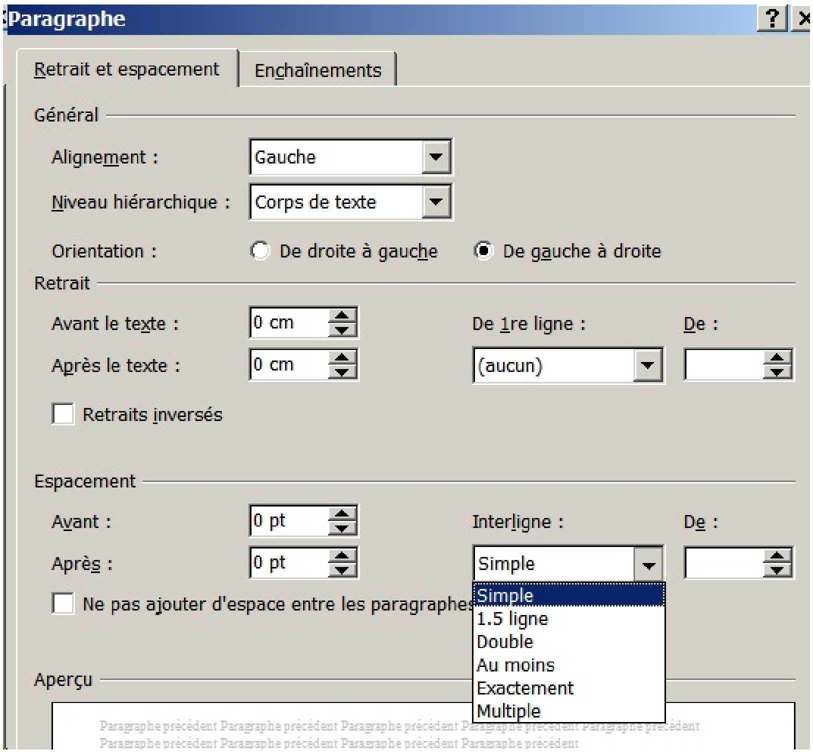
3. Line spacing

a. Main text

Double spacing is required for theses and most articles, though one and a half spacing (1.5) often looks nicer, and if you have a lot of material you want use, you may be able to use this compromise. The easiest way to do this within **Word 2003** is to use the Format menu: Styles and formatting (*Styles et mise en forme*) and set the 'Normal' style to Times Roman 12 point. In the Paragraph menu set Normal style to have 8pt before (so you can automatically have white space between paragraphs) and line spacing of 18pt which will give the double spacing required. [Advice taken from Hart 2004:20].

For **Word 2010** I advise you to first install the Classic Menu interface available from:
http://www.addintools.com/office2010/menutoolbar/index.html
From there, it is:
Format | Paragraphe | Interligne | Double or 1.5 ligne

Figure 7.1 Setting the line spacing in Word 2010



b. An extra line between paragraphs

An extra line is a good idea. See also 'indentation' below. It can also be set in the paragraph style settings if you wish. Personally I find paragraph styles a nuisance because the programs love to impose things on me and I like to be in more control and to create styles as I go along.

c. Tables and blocks of quotation:

1) Use single spacing. This is very important.
2) Be aware that line spacing can be juggled. For instance you could set it for 0.8 or 1.2. Tables can sometimes

be squeezed onto a page by using a smaller font.

4. **Right justify or ragged right text?**
In my opinion you should leave the text as ragged right. It is easier to read this way. The BEST OF ALL is when blocks of quotation are right justified, while the normal text is left unjustified (ragged right text).

5. **Page numbering**
   a. **The first few pages,** known as the 'preliminaries' should be numbered in Roman numerals, placed in the centre, at the bottom of the page. If need be, type these in separately. The first page of your introduction is page 1.

   b. **The text itself** should have the page numbers at the top right of the page, possibly with a summarised chapter name. The program should give you some space (1-2cm) between the page number and the text. You may need to adjust this space.

6. **Paragraph indenting**
   a. This is handled in two ways in most word processors
   First the 'tab' controls need setting, much as on a standard mechanical typewriter. These tabs need setting at 1cm intervals, before any writing is done. From this, you can look at paragraph style and fix the desired pattern.

   Second, a sequence of levels, recorded as 'styles' can be created, so that, when typing, you chose the paragraph level, and automatically the first line (a heading) is typed in the chosen size, and in bold, then, the next line begins with the paragraph indentation.

The previous two paragraphs are formatted using the traditional indentation of the first line PLUS extra line between paragraphs. As you can see, it does not look pretty because of the heading system.

b. Traditionally you should indent the first line of each paragraph by 1 cm. I said 'traditionally', because the modern style is to use block indent, as used in this book, with an extra line between paragraphs. Paragraph indentation also gets in the way of headings.

c. Blocks of quotations should be indented from the left AND from the right, the justification being optional.

> This is an example of a quotation indented from
> the left and the right, which is left as ragged
> text. As you can see this gives a very different
> appearance.

7. Use of colour

The normal rule is that colour must NEVER be used in a thesis, even in tables and graphs. This is because all theses are eventually photocopied, and copying is normally in black and white. Therefore, any illustrations must be prepared without colour so that they are readable in black and white.

But times are changing. Colour printers are common, and colour photocopying is now affordable. Therefore, in exceptional circumstances, a student may wish to ask permission from their supervisor to include a few illustrations in colour be they diagrams or charts. If this is done though, **every single copy submitted to the office must include a colour version of these pages.**

8. Punctuation

The modern trend is to reduce this to a minimum. This means:

a. Abbreviations rarely have full stops. i.e. is now ie – without stops. (Swan 1995:471).

b. Initial letters of people are without full stops. 'Dr. Andrew C. Burke' is now written 'Dr Andrew C Burke'.

Figure 7.2 Sideways Text

This is an example of the correct use of text on a page turned sideways.

9. **Sideways (landscape) text, tables, and diagrams**
   Sometimes a table, graph, or diagram needs printing in such a way that the page has to be turned sideways in order to read it. Which way do you turn the page, in the clockwise direction or the anticlockwise direction? In English the usual custom is to rotate clockwise.

   This means that the top of the page is along the side where the binding is. NB It is common to find people get this wrong.

If you do it is a big enough mistake for some examiners to insist it be corrected and a new copy of a thesis re-submitted; it is a mistake that causes a lot of irritation to some readers! If need be, turn OFF the page numbering, and write the number by hand.

B. Headings

1. The 'subject paragraph'

A *subject paragraph* is one paragraph or a sequence of paragraphs which are elaborating and developing the same point or sub-point. In a thesis, every sub-point is a *subject paragraph* and therefore needs a clear heading which shows explicitly the link to the other *subject paragraphs*.

As can be seen in this textbook, clarity has been improved by strict observance of this rule. There are no long paragraphs because long paragraphs are not easy to read. Long paragraphs can easily be broken up into smaller paragraphs.

In addition, whenever there are sub-points then instead of hiding them within extended prose, each sub-point has been given a heading.

2. Use of headings

The aim of any thesis, memoire, or article, is clarity. All reasonable means should be used to maximise clarity. Therefore each step in an argument should be clearly signalled with a heading. Another way of putting it is that every *'subject paragraph*' needs a heading.

Headings help a reader to follow an argument, and enable a reader to return to a point easily at a later time.

The only time where headings are not normally used is in the conclusions chapter, which should be short enough not to need them.

To those who dislike headings the question is put, that since the goal is clarity, **how can a thesis be clear if there are several pages of text without a heading?** At the very least the beginnings of key paragraphs should be gently highlighted by the use of italics. It is not without significance that the best advice available that I can find is found in the MLA handbook, the handbook for literature, and yet many people in literature persist in ignoring the rules set by the MLA and which they profess to follow, and persist in writing whole theses without a single heading in sight!

3. Wording of headings
These can range from short and cryptic to whole sentences. Short whole explanatory sentences give the most information.

Within a chapter, consistency of style is required, and is not always easy to maintain. Examples are given in Figure 7.3 below.

Figure 7.3 Examples of good and bad heading style

==

Acceptable examples:

1. Faux amis are important
2. Faux amis are deceptive.

OR

1. The importance of faux amis.
2. The deceptiveness of faux amis.

OR

1. Faux amis: importance
2. Faux amis: deceptiveness

Unacceptable examples

1. Faux amis are important.
2. The deceptiveness of faux amis.

OR

1. Faux amis: importance
2. Faux amis are deceptive

==

4. Choice of heading system
To my knowledge, the APA system is designed mainly for articles and how to write references for journal articles. The MLA guides give more help for theses. It can be categorically stated that there is no APA system of headings for theses. Therefore, any reasonable consistent system can be used.

It can be categorically stated that there is no APA system of headings for theses. Therefore, any reasonable consistent system can be used.

The most well known system is the legal system, sometimes called the decimal system. But the legal system is very limited. **It has the major disadvantage that it cannot easily handle more than three levels**, and in a thesis you may well want to go down to four or five levels. Less well known, but much more flexible and easier to follow is the 'Alternate letter and number' system. This system has the major advantage of easily handling up to seven levels of indentation.

5. The letter and number heading system
(See Gibaldi 1995:31-4 for a full explanation with a detailed example). Note that the first level, I. II. III. IV. etc is not always needed, and is often replaced by chapter numbers. The first level is often also used for parts/sections of a thesis.

Figure 7.4 The letter/number heading system

```
I.
  A.
     1.
        a.
          1)
             a)
                i. (Roman numbers)
```

In practice, the following is acceptable (see figure 7.5):

Figure 7.5 Recommended thesis heading system

Part I 26 point
Chapter heading 26 point

A. Main heading 20 point
1. Second level, 18 point
a. Third level 16 point
1) Fourth level 14 point
a) Fifth level 12 point, *italics* or bold

i Sixth level, small roman numerals

α Seventh level ie lower case Greek symbols

Another major advantage of this system is that it is very tolerant of font sizes and indentation. Therefore, variations like that in figure 7.6 are possible

Figure 7.6. Easier variant thesis heading system

Part I 26 point
Chapter heading 26 point

A. Main heading 14 point
1. Second level, 12 point
a. Third level 16 point
1) Fourth level 14 point
a) Fifth level 12 point, *italics* or bold

i Sixth level, small roman numerals

α Seventh level ie lower case Greek symbols

(Most headings are in **bold** print, and are NOT underlined. The fifth level onwards can be in italics instead of being bold).

I encourage students to skilfully use headings, to fourth or even fifth level if appropriate. If that means there are some sections of a thesis where every paragraph has the appropriate heading, then so be it. But I said skilfully and appropriately. Most parts of a thesis will have two or more paragraphs per heading – the so called '*subject paragraph*'. Sometimes, there is a commented list, in which each paragraph could well have its own heading.

> **It is rarely possible to use too many headings. It is easy to be inconsistent and to get the levels wrong.**

6. **The legal system** is also popular. It is NOT recommended when you have lots of subheadings, as it is difficult to follow. I have illustrated this with the fourth level below, which is getting very confusing. In this system, the chapter numbers are in large Roman numbers, followed by normal numbers. As in the other system, all headings are in **bold** print.

Figure 7.7 The legal system of headings

> **I. Chapter Heading 26 point**
> **I.0. Main heading 20 point**
> **I.1. Second level 18 point**
> **I.1.1. Third level 16 point**
> **I.2.2.1. Fourth level 14 point**
> I.2.2.2.1. Fifth level 12 point
> I.2.2.2.2.1. Sixth level 12 point

7. The APA article system applied to theses

Some supervisors are advocating that students use the APA system for articles, and adapt it for use in theses. The argument goes that, however much we dislike this system, it is very commonly required for when students go on to publish articles, therefore students should get used to it now in theses.

The APA system does NOT number the headings. So, for instance, if there are five main points, they each receive the centred header, but, on looking at the chapter and seeing the header, there is no way of knowing if it is the second third or fourth main point. The APA system is therefore distinctly NOT reader friendly, and it is full of needless detail since it abandons two simplifications of headings:

- Only the first word and normally capitalised words are capitalised
- Sometimes the body of the text begins on the same line as the header

First level	Centred. Bold. Capitalise as much as possible, no full stop at the end, and begin indented paragraph on the next line
Second level	Left-aligned. Bold. Capitalise as much as possible, no full stop at the end, and begin indented paragraph on the next line
Third level	2-3cm indent. Bold. Normal (minimal) capitalisation with a full stop at the end. Begin text on same line as the header.
Fourth level	2-3cm indent. Bold. *italicized,* Normal (minimal) capitalisation with a full stop at the end. Begin text on same line as the header
Fifth level	2-3cm indent. No Bold. *italicized,* Normal (minimal) capitalisation with a full stop at the end. Begin text on same line as the header

To apply the system designed for 10-20 pages, to a thesis of 100 pages or more, is very much forcing an inherently bad system and making it worse. **My advice is to know about it, use it when you are obliged to do so, and in all other cases use an easier clearer system.**

8. Make use of headings

In the field of linguistics, this goes without saying, but the Civilisation and Literature tracks seem to be under the misapprehension that the accepted style is to write whole chapters without a single heading.

The evidence is clearly in favour of headings, whatever was done in the past.

A clear system of headings improves the clarity and readability of the thesis. It is better to over-use headings than to under-use them.

Many people unfortunately only seem to know about the legal system. The APA guide only gives guidance for articles, and has nothing to say about theses. Therefore, any consistent system should be acceptable in a thesis.

a. The MLA Handbook itself recommends headings

The MLA handbook is supposed to be the definitive guide for the Literature tracks, yet the theses on literature written in Tunisia seem to ignore the guide.

b. The necessity for clear presentation requires headings

Since a thesis and its argument must be readable, and a thesis is usually long and should have a well sequenced argument, then failure to include headings is an admission that clear presentation is not important.

c. Leading style manuals insist on headings

...argumentative prose needs to be sliced. Nothing is more initially dispiriting to the reader of a scholarly book, article

> or thesis than the spectacle of heavy lumps of undivided prose. It dispirits even before any attempt to read has been made. And that is a further reason why the division into chapters or sections should be conceived of early, and why chapter headings reflecting a table of contents can guide the movement of prose as efficiently as a rush hour traffic-cop. (Watson 1987:36)

7. Conclusion

In the legal system only three levels are possible. In the alternate letter/number system, five or six levels are easy.

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CHAPTER 8
APPENDICES TOC and FIGURES

In this chapter important information is provided concerning the form and use of appendices and the Table of Contents (TOC) and other small details.

.

1. Appendices

a. Each appendix should be labelled consecutively, *Appendix XX*. They should be included in the Table of Contents before the list(s) of figures and tables.

b. All appendixes should be referred to at least once in your text, OR, in exceptional circumstances, should be prefaced by an introduction to the appendix which explains why it is included.

c. You may use a smaller font size such as size 10.

d. Use **singl**e line spacing, not double.

e. Use of appendices*:*
   Put data and raw information here so as to leave the text of the thesis uncluttered. Here is the place for:
   1) a biographical essay if needed
   2) explanation of some fine point of the methods
   3) the text of surveys
   4) copies of the questionnaires
   5) the raw data of questionnaires
   6) the raw results, the calculations and the statistics.

2. Table of contents

a. Will you put one at the beginning of each chapter as well as at the beginning of the thesis? This practice makes for great readability and clarity of the argument. It is highly recommended, especially for doctoral theses, or where the chapters have a lot of headings.

b. When doing the contents pages omit the underlining or italics used in the text. You may need to turn off the bold, and reduce the font size of the larger headings.

c. Separate lists of tables and figures MUST be included. If you wish, you may combine tables and figures, and refer to them all as figures.

d. Usually all the headings in the TOC are in 12 point regardless of their actual level, with perhaps the chapter headings being in 14 or 16 point. If you use four or five levels it is sometimes possible to NOT include the lowest level.

e. Make sure you right justify the page number, which means, make sure the numbers line up and are flushed against the right hand margin.

3. Figures and tables

[Note, from now on, they will simply be referred to as figures].

a. All figures must be placed as near as possible to the place in the thesis where they are discussed.

b. All figures need to be specifically mentioned in your narrative, and the main points, or the points you are interested in, need highlighting and discussed.

c. All figures need a heading. They are numbered sequentially within a chapter. Eg if your results chapter is chapter 3, then the second figure in that chapter will be called ‘Figure 3.2' .

d. In one style Figure headings are in capitals, in the same font and point as the thesis text ie Times Roman 12 point. In another style, as used in this book, Figure headings follow the normal patterns for writing a sentence. In both cases a descriptive phrase can be used.

e. Switch off the page numbering temporarily if extra space is needed.

f. Use single spacing for figures.

g. You could use one of the figures and tables templates available in Word, or, you could draw them yourself as I have done below. In which case note:

    Begin the figure proper, after the heading, with a double line, and end with a single continuous line. Explanatory notes and references can go immediately after the single line. Figure 8:1 below illustrates these rules.

FIGURE 8.1 DAYS OF THE YEAR

days	months
28	February
30	April, June, September, November
31	January, March, May, July, August, October, December

(Note, February has 29 days in a leap year).

4. **Figures requiring landscape orientation**
   If you need to present a figure in landscape format, note that the heading goes nearest the side where there will be the binding. A page is turned clockwise to read it.

5. **Punctuation of abbreviations**
   Punctuation is disappearing in English, though there may be some differences between British and American practices. In the 1960s the rule I learned in school was that *Mr* was not punctuated, but *etc.* was, because a full stop indicated that there were some remaining letters. Thus *Mr* in finishing with the *r* of Mister was unpunctuated, but *etc.* needed it because the full word is etcetera. In the 1970s the customs changed so that even *etc.* and *i.e.* need no longer punctuated. In the last ten years or so, the apostrophe has been under attack. Nowadays we write 1990s not 1990's.

   There are very few common abbreviations left which require punctuation. Even A.D. and B.C. have become AD and BC.

   Now it could well be, sadly, that students have been taught practices that are out of date. However, at MA level, that is no longer an excuse, since an MA is part of the training needed to become a professional at University, and a professional by definition is one who makes some attempt to keep up to date, otherwise their teaching is unprofessional. Once again, candidates are advised to establish a style, then consistently maintain it.

   One of the biggest errors in a thesis is to mix styles. Therefore in the thesis writeup candidates need to keep a list of the style decisions they make, and ruthlessly hold fast to their initial choice.

Consistency in style is extremely important. Therefore writers should maintain a list of the decisions they make and rigorously apply them.

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CHAPTER 9
QUOTATIONS AND FOOTNOTES

NB. "Quotations" use double inverted commas,
whereas
'emphasis' requires single inverted commas.

Failure to maintain this distinction consistently is a VERY common mistake in academic writing and is inexcusable.

Style handbooks are usually very vague on this point. But the distinction between a quotation and an emphasised word or term MUST be consistently made, and the easiest way to do so is through consistent use of double and single quotation marks.

A. Quotations

1. Why make a direct quotation?

I have already explained that a quotation should be rare. The standard explanation given in style books such as these is that a quotation can only be permitted if it meets in full the following criteria in reason 1 below. In addition there are two other possible reasons.

Reason 1

a. The idea is exactly what you want to mention. **AND**
b. The actual wording itself is significant to your argument. See Figure 3.2 for a rare genuine example of this in this textbook.

Reason 2
The writer said something surprising, and not well known to the reader, therefore a few short quotations are provided to prove that the writer really did say that.

Reason 3
Sometimes a reference is to **'grey' literature** which is not readily available to the reader. In this case the writer does the reader a service by providing the raw data in the form of a quotation.

NB, the main place for such grey literature is in an appendix. Do not hesitate to include grey literature in your appendices, and refer to them in your text. When you do so you can paraphrase as usual. This is the preferred method for handling grey literature.

2. **Example of genuinely needed quotations**
   a. **The viewpoint of incredulous amateurs**
   For some reason, students often find the restriction on using quotations to be hard to believe, and they are incredulous. Let me paraphrase what students might be saying.

   > Who is Dr Lowe to insist? Surely he is wrong! By what authority does he insist so strongly? Surely this is one of several areas where Dr Lowe needlessly makes a fuss! It is just one of his idiosyncrasies and he can safely be ignored! Afterall, there are many areas in this book where he admits there are differences of opinion, and this must be one of them. So, since I like quotations and they look good I will use lots of quotations. Afterall, they prove that I really have read the texts, and they prove that I know how to learn from the authorities in my field.

   b. **The ONLY reason for using a quotation below:**
   I am giving two quotation now from an authority on this subject because I think that some students will not believe me unless they see some quotations and read the actual words of the writer instead of relying on Dr Lowe's quirky mechanisms for the digestion, and regurgitation of ideas. **In other words, I feel the need for quotations because otherwise some readers will dismiss my statements as merely the personal prejudice of the author.**

> The original writer may have made a classic, and succinct, statement of the position; it is so well expressed that the language cannot be improved on (Berry 1986:33).

OR

> The statement, even if badly expressed, may be so fundamental to the writer's position that it should be quoted in its entirety (Berry 1986:33).

In this case the actual wording is very significant to my textbook, because I am trying to convince the reader of the importance and the accuracy of my point, and **I suspect that some students are not willing to accept this point unless they see some evidence that other textbook writers also agree with me.**

3. **Why do amateur researchers frequently and massively over-use quotations?**
   Some students insist on writing their literature review as a series of commented quotations. Here are some possible reasons. As such they form some interesting hypotheses that may be worth investigating if they could be worded in a testable format, and if a suitable group of thesis writers could be found for investigation, and if suitable methods could be found for this investigation.
   a. The student is treating the literature as pieces of data that need presenting.

   b. Since the quotation speaks for itself, surely it is possible to weave together a series of quotations?

   c. The student is not confident in accurate paraphrasing.

   d. It is a question of attitude – referenced paraphrases seem to lower in status.

   e. The student uses a series of quotations as a crutch. They are afraid to write and express themselves in their own words.

4. Possible solutions to the problem of over-quotation

a. Make sure you fully understand the rule.

b. If you find yourself using a string of quotations, then you are probably not following the advice given in Chapter 6 when I state that “a literature review is an argument backed by the literature”. A literature review is not a string of commented quotations, it is an argument rooted in the literature. When you focus on the argument you rarely need quotations.

c. If you find yourself using too many quotations, then in one of the re-writing steps, systematically go through all your writing and ask yourself, for every quotation, if it meets the criteria, and if not, then rewrite and paraphrase.

5. Why quotations should be used sparingly

Frequently, a whole chapter can be reduced to a few sentences. You paraphrase a passage for the importance of its content; one quotes directly for the additional importance of its mode of expression. (Berry 1986:33). Note, here I have paraphrased this authority and in doing so considerably shortened the words, while still giving a detailed reference and so providing support for my statement.

The lack of quotations means a text is concise, flows, and is more readable.

6. All quotations should be introduced then commented on

A quotation should not just be inserted into the text. In this respect, a quotation follows the same rules for figures and tables.

a. A quotation needs preparing in your text, just like I did above.

b. A quotation needs implicit or explicit justification. It should always be obvious to the reader why you have needed a quotation. If the quotation is not unambiguously and clearly needed implicitly, then make the reason for the quotation obvious by explicit explanation.

A quotation needs implicit or explicit justification. It should always be obvious to the reader why you have needed a quotation.

c. A quotation needs a commentary and needs linking in to your argument.

7. **Short quotations**
   a. Up to six lines can be incorporated in the text by using inverted commas. In other words, short quotations should be incorporated into the paragraph, and be enclosed in double quotation marks.

   b. To make a quotation shorter, words, phrases, or sentences, can be missed out. This is indicated by three full stops.

   c. If you need to add explanation, eg to specify a pronoun, or to make the quotation fit your grammar, you put your own extras within square [] brackets.

8. **Long quotations**
   Quotations longer than 3-6 lines MUST be inset as a block (**single spaced**, right justified if possible), without inverted commas. Especially when quoting examples you can use indented quotations even when they are as short as two lines long. I have found it useful to use the inset block format for even one line of quotation in many instances, especially when I was giving a parallel translation of the quotation.

   Note, the APA style for articles requires double spaced, as does the very useful OWL site at Purdue University, a site which otherwise has a lot of practical advice and suggestions. In thesis writing, long quotations are usually single spaced.

If you really must have a long quotation.

Long quotations begin on a new line, the whole paragraph is single spaced and indented, without quotation marks.

Long quotations should be re-considered. A summary with a few short phrases is almost always better and a paraphrase is the best.

9. Quotations in another language

All words should be in italics/bold/underlined WHEN USED IN THE BODY OF THE TEXT, but this is NOT when an indented quotation is used. Indented quotations in another language take neither inverted commas nor emphasis.

10. Translation of quotations that are not in English

In a thesis you MUST provide translations

Usually, an official translation is not needed. There are several common formats. I have placed the preferred system first.

a. ☞ Use parallel columns for translations ☜

This is the easiest solution, and the one I prefer. Most word processors allow this. Note that when done in this way it is NOT necessary to put the foreign language in italics.

Peculiarities of Arabic
Trying to put Arabic text and English on one line can lead to all sorts of editing problems. There are three easy solutions.
1. Always keep Arabic and English on separate lines. Set up styles to cope with this, so you just apply the appropriate style.
2. Set up a table. Maybe you can make the lines invisible ie not printed.
3. Use a program to make a small image file of the Arabic text. In this way you are moving a small image around, which is a technique relatively easy to learn. See Chapter 19 section 4, Clipboard extenders and screenshot tools.

b. **Write the translation in brackets after the original**
If the quotation is long, then give the translation immediately after the quotation.

c. **Footnote the translation**
If you only have a few examples, then this is a good option.

d. **Do not translate a phrase or sentence**
In this case the context must be sufficiently clear that the explanation is obvious, even to people who do not read that language.

11. **What happens when the source gives the original and a translation?**
In these cases one should say so in brackets, eg (translation Défourneaux). In cases of ambiguity as to who was the translator one can also state your own name eg (translation Lowe) or (author's translation). You may want to state in the glossary that the translation provided is a guide to the original and discussion of the quotation therefore depends on the original not the translation. Such an explanation is a way of anticipating and answering in advance any potential difficulty from an examiner.

12. Write Arabic in the Arabic script and do NOT provide a phonemic transliteration

Some students may be tempted to provide a phonemic transliteration of Arabic. I advise you not to do this because there are many systems of phonemic script for Arabic, and so far there is not one system which is well known and which dominates. Of course, provide a translation into English.

13. A paraphrase

a. This is done without quotation marks. The words must be those of the student, and not just changing a few words. "...to borrow another writer's exact words without acknowledgement ... is just plain dishonest." (Berry 1986:34).

b. **If possible, the reference, including page number, must be given, even in a paraphrase**. Failure to make this acknowledgement is just as much plagiarism as the borrowing of another author's exact words. (Berry 1986:34). With the internet, precise page numbers are not always possible.

14. Ideas must be referenced, as well as actual quotations

It is unethical to use or copy someone else's idea or work and pretend that you thought of it. A paraphrase must still be acknowledged. For a diagram that is adapted, preface the reference with 'after', or 'adapted from' (without including quotation marks).

Note. It is perfectly good style to write using your own words, and to quote the key words or phrases, putting them within your own sentences, using quotation marks.

15. Useful phrases:

As X points out
X tells/shows us that
X draws it to our attention that
To quote from X
In a book/article entitled "...."

X makes the point that
It was X who first said
X states/suggests that
Referring to ... X says suggests, implies, proposes, puts forth, submits, poses, propounds, hints, intimates, insinuates, declares, asserts, maintains, contends, alleges.

16. Cross references

a. **Avoid ibid and op cit**. Even in the MLA system, it is now forbidden. "Do not use the abbreviations ibid. and op.cit."(Gibaldi 1995:256). There is no need, and there are better ways.

Notice why I have included a quotation. This is because the rule against these terms comes as a surprise to many. In a previous edition of the MLA handbook, this world authority in 1995 categorically forbade their use, and here is the proof.

1) **For frequently cited works**, use an abbreviation for the work, and in the main body of the text in brackets, or in a footnote give the abbreviation and page number, every time. eg '(OED p25)' for Oxford English Dictionary page 25. **This can even be done for those using the Harvard/APA System**. I once spent hours checking every footnote in a vain attempt to trace an ibid reference. The aim is to speedily direct the reader to a source of information, hence the better ways presented here.

2) **Harvard/APA system,** cite Author (date + page number) in the text every time.

3) **'Alphabet numbering' or 'Citation order' systems**, either give the number in the bibliography and the page

reference, or, particularly if references are given in full in footnotes, refer to the footnote number then the page reference.

4) **For MLA,** use the wording "see reference (note) xx page xxx"

b. A book frequently cited can be given an abbreviation.

1) These abbreviations should be listed in the glossary at the beginning of the work.
2) Every time the reference is first used in a new chapter it should be explained.
3) Books given an abbreviation can be listed by the abbreviation in the bibliography.

Example of the Oxford English Dictionary:

- In text format: "OED (1989 page.. or word)
- APA References format: OED (1989) The Oxford English Dictionary. Oxford UK.

It is usual with dictionaries to give the word consulted rather than the page number.

c. It is easier to cross reference within the thesis using chapter and section numbers than page numbers.

Section numbers change less frequently in the writing process than page numbers. Cross referencing is an important part of the work on later drafts.

B. Footnotes

1. In defence of footnotes

In recent years I have heard several comments from colleagues that footnotes are not a good idea – the material should be included in the text. Some say that it is no longer the modern style. Others say that they should be avoided because they are difficult to use and students do not know how to use them properly. I suspect that some of the reaction against footnotes stems from their over-use. There is also the rumour that the APA Style no longer supports them.

There is an often forgotten fact about the APA style that we are supposedly following: the APA manual is designed for papers, not for theses. That explains why for instance the APA manual has completely different guidelines for headings to that presented in this manual. It also explains some of the dislike of footnotes. The simple fact is that footnotes are often expensive in published articles and books, therefore they should be reduced to a minimum. Notes at the ends of chapters, or at the ends of books, are a cheaper alternative. That reason does not apply to theses, and may no longer apply to much material that is published with modern methods.

More serious is the argument that footnotes are distracting and are bad style. I find this argument curious. I actually like footnotes. When I first read a book I like to read the summary, the table of contents, the references and the footnotes. Only then will I get interested in some of the chapters. My major frustration is when the footnotes are moved to the end of a chapter or to the end of the book: I then do not have enough fingers to use in the book, to follow both footnotes and the text.

Why do I like footnotes? For the simple reason **that they maintain a text which is uncluttered and clear**. Inevitably in a long carefully argued piece of writing there will be important comments and nuggets of information which need to be present, but which are secondary to the line of argument.

Footnotes are 'optional extra reading' which fill in the gaps.

They are especially useful when there are two or more audiences for a work. In my own thesis for instance, I was writing for British examiners and researchers who would not know much about the system of education in Tunisia. I was also writing for a Tunisian audience who would not always know the general knowledge that could be assumed by someone in Britain. Therefore I used footnotes to politely cover these details, especially for the various meanings of words.

In addition, my work was a combination of linguistics, education, and Baccalaureate science. I assumed a basic knowledge of science up to the age of 16 (American grade 11, British O level or GCSE level, French level three years before the Baccalaureate). [Here I have just written a comment which I put in brackets, which with advantage could have been placed in a footnote]. To cover all these disciplines I used footnotes to supply any potentially missing pieces of information, or to clarify any small point that could be confusing in one discipline, but not necessarily in another.

The point is that **each discipline has its conventions and assumed knowledge which do not need explaining**. If these points are explained in the text then the writing becomes needlessly wordy from the point of view of one discipline, but if they are not explained then in another discipline this would be considered to be missing information. It is possible to be so concise from one point of view that your thesis could even be viewed as lacking essential information. Yet if you elaborate in your text, you could be accused of padding your thesis with well known information that does not need to be stated. Footnotes are an easy solution to this dilemma.

My advice therefore to candidates is to **use footnotes, appropriately, and in the glossary to insert a small note in defence of your choice of style**. In this way an examiner can only fault the candidate on their mis-use of footnotes, and cannot fault the candidate for using them.

My question to my colleagues is, **how can dislike of footnotes be reconciled with the higher priority of writing a clear text uncluttered by brackets and uncluttered by distracting but important information?**

2. Reasons for footnotes

a. To avoid using brackets. Remember, brackets must be used sparingly in a thesis.

b. To give extra information about a topic. Especially useful to cover sidetracks and loose ends, so keeping the main argument clear.

c. To give extra explanation of words, phrases, or concepts;

d. To provide short definitions especially of terms that are not important enough to the argument to warrant (justify, be worthy of) inclusion in the main text.

e. To provide supplementary references, as proof that you have covered the wider topic, though you are choosing not to concentrate on these.

f. To provide further examples.

g. To provide short translations. NB specify who did the translating.

h. To provide supplementary argument which can amplify, clarify, or otherwise support the point made.

i. To answer anticipated objections to the point being made.

j. To signal the major writers who disagree with the point being made.

k. To explain when there are several audiences, or several meanings in various disciplines.

3. **Footnotes are easy to do on the computer**
   You type them on the line immediately after their marked number, and the word processor automatically puts the text at the bottom of the page and at the same time keeps track of how long the page for the text is supposed to be. Many programs have a 'preview' so that you can see the layout as it will be printed.

4. Recommendations:

- Same font as the text.

- Ten point, and use either [1] or [1.] in the text. If the superscript option is chosen, then you need to make sure it is in bold text, and easy to see.

- You must number per page. This means that on each page you begin the footnote as Footnote 1. It is unacceptable to use continuous numbering within a chapter in a thesis.

- All footnotes must be on the page. Where this is not possible, you must at least begin the footnote on the page, and continue on the next page. If you find yourself footnoting the last word on the page and there is not room for a footnote, then it is up to you to insert an extra line space somewhere on the page to force the text requiring a footnote onto the next page.

- Single space.

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CHAPTER 10
THESIS STYLE STANCE AND VOICE

1. Use of acronyms and other conventions

Figure 10.1 below details some commonly accepted and not accepted abbreviations in academic work. In addition, every discipline has its set of abbreviations and acronyms that do not need explaining when writing for someone in the discipline. Your supervisor should be able to guide you, and there may be published lists. A good place to look is in the 'advice to authors' provided by journals. Having said that, there are some guidelines which are generally applicable.

a. The first time an acronym or abbreviation is used then it should be written in full, with the abbreviated form in brackets. If there is some discussion, this can be footnoted. Afterwards, only the abbreviated term need be used.

b. A glossary is a useful extra, in which they can be presented and explained, and if there is a full discussion of the term, then this can be forward referenced.

c. Since very few readers actually read a thesis from the beginning to the end, but are likely to read the end chapters before they have read the first chapter, it is good practice to elaborate the abbreviation **the first time it is used in each chapter**.

Figure 10.1, Table of common abbreviations

cf, cp	compare, note cp is used rarely
et al	Written in italics, means *and others*, used in references when there are more than two authors to simplify it to the first author *et al*.
ff	following, used in indexes, and when indicating page numbers eg p64ff
ed/eds	editor(s), edition(s)
nd	no date given
np	no page – common in internet references
pp	pages
trans	translator, translated, translation
[sic]	Used when quoting, and the author makes a mistake. This [sic] is inserted immediately after the mistake to indicate that it is a genuine mistake and you have noticed it and the fault is not a copying error. Note that anything in [square brackets] within a quotation indicates your added material. Square brackets are useful, for instance, to supply a missing referent, or to explain the meaning of a word or phrase.
ibid, loc cit, op cit	**These are old fashioned terms**, used in the MLA system, in the footnotes, to shorten the footnoted reference. There are nuances in meaning between them, but they all basically mean the reference previously given. Please note that these forms are NOT MLA style: they have been unacceptable for many years. If you need to use something like it, consult the MLA handbook for alternatives. (Gibaldi 1995:256)

1. **Style varies according to content and purpose of writing**
   There are ideas around that a thesis should have a fixed style eg never use the active tenses, and certainly never mix the active and the passive. Many features of style need to be fixed in advance, as detailed elsewhere. Often the exact choices do not matter: what matters is consistency throughout the thesis. In other respects though the style should be moulded by the material and the conventions within the discipline.

2. **Use of 'we' and 'I'**
   Note that sometimes the 'we' is used as the 'royal we' meaning I. This rarely works when used often, but can be a welcome change of style when moving from one section to another, if used sparingly, especially in a thesis. 'We' is used in journal articles to indicate the writer and the reader. The use of 'I' has its place, particularly in the more personal sections of the thesis such as the justification for the choice of methods. The frequent use of 'I' is irritating to many readers: the passive breaks this up.

3. **Be pedantic and avoid ambiguity**
   There is room to be pedantic in a thesis. X said this, with synonyms for 'said' may need repeating hundreds of times. **Avoid pronouns and anaphoric reference**: specify them repeatedly. Anaphoric reference is the use of a linguistic unit, such as a pronoun, to refer back to another unit. Example: the use of **her** to refer to **Anne** in the sentence Anne asked Edward to pass **her** the salt. Also, make explicit your train of thought by using linkers. A thesis is not a detective novel. The reader should never have to struggle with the reasoning. Sometimes a reader will say that they understand every word but do not understand what is being said. The author must accept a large part of the blame for this problem.

4. **Sentence length**
   In general short sentences are clearer. For a thesis an average sentence length of 16 words would be reasonable. But **readability means variety**. Short sentences are needed and so too are long ones. It is sometimes not possible to express

oneself clearly in a series of short sentences, since the link between clauses needs to be made explicit, and many of the linkers cannot be used at the beginning of a sentence. [The last sentence had 39 words]. A series of short sentences can then be counter-productive: they can make the writing harder to read, since the reader has to do more work to supply the missing (but implied) linkage.[33 words]

Having said that, long sentences can frequently benefit from being divided into two. The goal is to achieve a clear logical presentation, and the appropriate form and style must be used.

Style checkers are useful here. Make sure you use the one provided with your word processor. Long sentences, or incomplete sentences are sometimes detected by style checkers.

5. **Continuously ask oneself and state the answer to the question 'so what?'**
   When finishing a point that has been illustrated and argued, it helps to make the point explicit. A short sentence beginning 'so...' helps the reader.

   The writer must make it easy for the reader. The writer must spell out the answer to the question 'so what?' continually throughout the thesis. Suitable phrases in the results include:
   - -- the data supports/conflicts with/is not in agreement with the hypothesis;
   - -- the results are inconclusive.

'Relevance' is to your argument. Why are you telling me this? What is the point you are making? Your point should always be obvious: if it is not, then the paragraphs need re-writing.

6. **Hypotheses and research topics or questions need wording with especial care**
The important point is that they need to be clear and testable.

7. **Avoid using brackets and dashes**
Brackets, – or paired dashes – are irritating to readers.
Brackets, (or paired dashes), are irritating to readers.
The dashes are usually typed as two short dashes followed by the spacebar which then converts them into one longer dash so that -- becomes –

Brackets, sometimes called parentheses, should be used sparingly. Often parenthesis indicates a complex sentence that has too many clauses and is far too long. Such sentences need re-ordering and restating as a series of short sentences. Often parenthesis can be replaced by a pair of commas. Footnotes are a convenient place for information that would often go into brackets.

8. **Use single and double inverted commas correctly**
There seems to be a lot of confusion over their use. Occasionally the situation is not clear, in which case the baseline advice applies: choose a style and use it consistently. Double inverted commas are used for quotations. Single inverted commas are used for emphasis. Italics are used for foreign words. If quoting a quotation the French versions « » and < > are available and permissible. In some cases you might want to use the French version throughout for one kind of emphasis: they are certainly very visible and clear.

9. **Picture your reader**
This is a basic writing technique, to imagine a reader, and write accordingly. A suitable person to imagine would be another MA student who is NOT a specialist in your subject. This means that any MA student of English should be able to read a thesis in history, linguistics, or literature, and be able to follow it.

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CHAPTER 11
DRAFTS AND PROOF READING

A. Note taking

1. Introduction

This chapter presents the process of writing a thesis, from early note taking, through the different drafts through to the final proofreading steps. Well over half the time required to research and write a thesis is taken up with re-writing, therefore this chapter is very important.

2. Always have a pen and paper available

Research never stops. From the time you first have an idea and start to read about the subject and to write down some ideas, you will be immersed in notes – on paper and on the computer.

Good researchers develop a passion for their work – it is always on their minds, even when they are supposed to be asleep. Since some of the best ideas come while the mind is not focussed directly on the research, and the ideas come at awkward times such as the middle of the night or while crammed on a metro, and these ideas vanish as quickly as they come, it is very important that researchers establish easy ways of noting them.

For many, a simple voice message on a smart phone or voice recorder will be excellent. I suggest that all researchers keep three pens and two sheets/scraps of paper with them at all times (it is very frustrating when a pen does not work, and sooner or later you will be in panic because two pens in a row will not work). At night I advise researchers to have a torch available so that they can get up and note down ideas without disturbing others.

3. Taking notes when reading references

It is easy to get overwhelmed with masses of information and ideas. Here are some ideas for coping.

a. Buy a cheap printer

A cheap printer will enable you to make printed copies of articles etc. It is much easier to be organised when you have piles of paper than to use electronic media.

Consider buying a laser black and white printer since the cartridges last longer and are cheaper to run per page than the inkjets.

b. Interact with articles

When you read an article, interact with it. Make notes and comments in the margins. Provide at the top the key words and a note as to what possible use it could be to you.

c. Note in full the reference

Especially with internet sources, take care to note down the original source location – the URL. This is a chore, and can be very tedious. But, if you do not do this as you go along you will find yourself having to spend hours – even days – at the computer googling the titles and trying to find the web reference information.

In the chapters on computing I show you how to save the URL to a pdf document at the same time as you first read it.

4. Take notes when collecting and analysing data

In research, particularly if fieldwork is involved, several kinds of records need to be kept.

a. Objective data notes

These are records of what happened, when, to whom, where, and what was said.

b. **Personal notes** ie personal comments, reflections on what was happening/happened.

c. **Analytic notes** ie preliminary analyses, essays, reports. Writing mini-essays, mini-reports, just for yourself, and writing them whenever the mood takes you at any stage in the research process is a very valuable way of developing your ideas. Since only you will read them, they can be full of holes, but this is of no importance. A researcher facing the writeup of the first draft will find their work a LOT easier if they already have some of these analytic notes ready.

Writing mini-essays, mini-reports, just for yourself, and writing them whenever the mood takes you at any stage in the research process is a very valuable way of developing your ideas

5. **Advice from experience**

a. **In taking notes when observing lessons**, I frequently wrote down what was happening, on the left, (ie words spoken, plus descriptions of actions, and what went on the blackboard). I left space on the right for my own comments which I made at the time. Later, any extra comments I added would be dated, and thus identified as later comments.

b. **It helps if all material collected is indexed** as you go along (with keywords).

c. **It helps if your own rough notes have a heading for each paragraph.** This applies to the notes taken before writeup starts.

d. **Each paragraph of notes you make should be on a separate piece of paper**. I used coloured paper, using my colours as a rough classification system. One colour for observation notes, another for reflection, another for first draft. This is crucial.

B. Writing a thesis

1. **Before you start writing, think of your audience**
   Every good writer first thinks of their future readership, their audience. Some students think their audience are the examiners, who are experts in the field. They then write as if they were writing only for experts. They write as if they were publishing a paper on the subject in an ultra specialised journal where intimate knowledge of all the technical words and ideas can be assumed.

   In fact, the intended audience should not be higher than a final year undergraduate student of English. This student may well have specialised in history or literature and know nothing about the specialised field of the research. It is the writer's task to be clear, without being condescending.

2. **Order of writing the thesis parts**
   a. Begin with methods and results
   I suggest that students begin by writing up their methods, the results, and the appendixes. Raw data belongs in an appendix. The results must be a clear presentation of the findings. After that students should write the literature review and the discussion. Sometimes it is hard to decide what should go in the literature review, and what should go in the discussion. I like to see the main material presented in the literature review as a context for the experimental work, then, the reviewed material is re-visited in the light of the findings. The discussion relates the findings to the literature. Finally, students should write the preliminaries and the bibliography.

   b. See writing a thesis as a process, from first to final draft
   A few people work on one chapter at once, and work on it until it is very advanced, then move on to the next chapter. **Most people do best to start writing rough drafts as soon as possible in their work**.

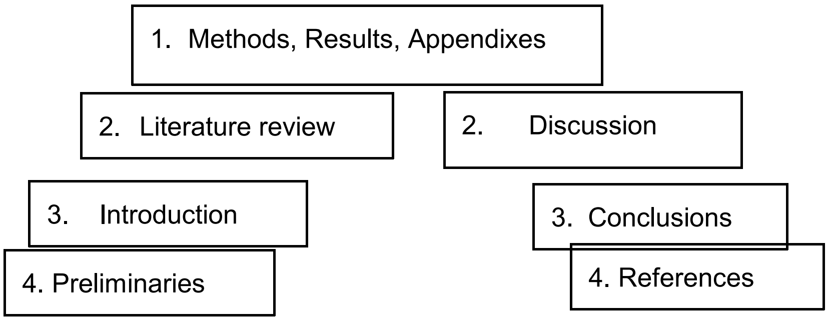
c. Literature review after writing up the results

I encourage students to start with the results chapters and NOT the literature review because, to some extent, **you do not know exactly what literature to review until you have collected your data**. On the other hand, you cannot start 'cold' and dive straight in to data collection, because collecting data without knowing why you are collecting it is a waste of time – you will not know what data to collect, and how to analyse it.

Doing research involves riding two horses in parallel: the literature, and your own data. There is a tension. **You must plan in advance how you are going to analyse your data.** That is why I encourage students to write a good quality research proposal in which the main elements of a literature review are known, the hypotheses are clearly specified, the appropriate methods for testing the hypotheses have been identified and the researcher has an initial idea of how to analyse the data. After that, the priority switches to collecting and analysing data. During this time it is quite likely that the researcher will be continuing to read the literature and develop their ideas. Some of the experimental work will require more in-depth studying of the literature.

The Literature Review and the Discussion are written up once the first draft of the results has been written, because only at this point is it clear to most researchers exactly what literature to formally review! All good literature reviews are highly selective and focussed, even though the researcher will have spent many happy hours studying articles and books which are never eventually referred to. But, be assured, such material that is not included is rarely wasted since it forms the wider background which is essential in the professional development of the researcher.

Figure 11.1 Order of writing a thesis



3. View and plan on writing a thesis as writing and rewriting at least four times

As Watson says, "writing is largely re-writing" (1987:9). This is hard work, but can be planned and organised so that it is not too daunting.

Most students do not realise that over half the time on a thesis will be spent re-writing. As a result they put off writing, and are not prepared for the demands of the writing task.

4. Overcoming writers cramp

a. Organising your notes and starting

Most writers find it very hard to get started, and it may be very comforting to the beginner to know that many famous writers have suffered from their inability to actually start writing the first draft. The difference is of course that experienced writers know how to work through the problem: they see writing as work, therefore settle to it in the same way that anyone settles to do a job that must be done.

Writing actually starts with the notes taken when reading books, or taken from the practical research such as interviews. The first step is therefore to be organised in your note taking, as recommended here, and to collect all the relevant material for a chapter into a file or box. Then the material needs grouping and placing in order, noting the gaps but not stopping to work on them.

The first draft is now simply a re-write of the material you have now just placed in order!

> Before you start writing, collect all your notes for that section. Put them on a large table. Now group the notes by rough headings. Group and regroup your notes. Develop an outline.
>
> Put the piles of notes in order. Then take each pile in turn and start writing. Do not stop. [Insert square brackets for gaps . . . and notes to yourself] and keep going.

b. Take regular breaks

It is also important to **stop for a break when you are in the MIDDLE of something**, not when you have finished a major section. It is much easier to get back to something you have interrupted than it is to start something fresh. At the very least, when you stop, make a note of the next few things that you wanted to do. This will help to get you going the next time.

c. Do the hardest writing when you are fresh

In general, plan to do the hardest work when you are most capable, and when the circumstances are best. For some this will mean getting up early to have quiet, for others it will mean working late. On the other hand, routine work can be kept for when you are not feeling very creative. Often there is also routine typing to do that is basically copying, or correcting. Such writing can with profit be reserved for the times when concentration is low. Personally I find correcting on a computer difficult to do: I much prefer the printed copy. Do feel free therefore to print out each day the work you have done – it will help you, and serve as a backup.

d. Reasonable writing targets

As a target for writing. Assuming you can type at 20 or more words per minute, then 3000 words a day is reasonable work (about 10-12 pages, assuming double spacing). Professional writers can work at 5000 words per day, every day, but they are exceptional. In my experience, provided the information is there, 3000 words per day is an achievable target. **This means that the first draft of a 100 page thesis should take two or three weeks of full time work.**

In practice, few students I know seem to be able to organise their time to work quickly. I therefore suggest the following, based upon experience, observation of students, and reading of books on study skills.

e. Organising your timetable

The writer needs to objectively look at their week and term, and identify when the quiet times are. They may be during the holidays, or they may not (perhapsbecause children are at home and need occupying). The quiet times may be certain days of the week. It may be early in the morning before family are awake. It may be late at night because in summer it is cooler then and in winter the heat is still on.

The writer needs to actively cut themselves off from all but the minimum of essential commitments. One student I know, who finished in just over a year despite being sent south to teach and having to teach in that tough first year of teaching was asked how he did it. He told me two things:

> **First, you have to want to finish, and want this badly. This means you are willing to make sacrifices.**
>
> **Second, you just have to be antisocial. You have to avoid cafes, avoid friends, and disappear**.

Another student I know managed to arrange all his teaching on three days, and for three days a week he disappeared into a library. He worked hard on writing and research for three days, then returned to work and family responsibilities the rest of the week. The exact details vary as to how best to find time, blocks of time, for writing. A student needs to be motivated enough to decide on a plan of action, and firm enough to pursue it even if family and friends do not understand.

You have to want to finish. You have to be anti-social, and well organised.

5. **Highlighting gaps in early drafts of the writing**
Often when writing the early drafts there are gaps that must be subsequently worked on. It is very important to develop a system to highlight these gaps so that they can easily be found later. It is unproductive to stop in the writing stage and check each detail before writing more. Gaps should be left and worked on as groups of gaps. There are at least three kinds of gaps.

a. **A gap where a reference is missing or needs checking** or needs further information such as page numbers.

b. **A gap where more explanation is needed**

c. **A gap for cross references, forwards and backwards in the thesis, which need inserting later.** NB these are very important for improving readability and clarity in a thesis. They are generally worked on in later stages of thesis writeup, but can be prepared for even in the first draft.

d. **One way of noting these gaps** is to have a formal symbol or mark, that can be searched for later using the FIND routine of the word processor. Many people use square brackets [...] but this is not as good as the following:
   1) For references, type in capital letters REF XXX

   2) For explanations, break the paragraph if necessary, and go onto a new line in the far left of the margin and type: XXX: plus a note of explanation

   3) For cross references type in capital letters CP XXX

4) When the draft of a chapter is finished, it is a simple matter to collect all the gaps: simply use the FIND command and find the appropriate codes such as REF XXX, and make a separate list of the missing information that you have found. You can then work on all of them at once. You can do a similar process to accumulate all the explanations and cross references.

6. The first draft

a. Write in the easiest order

See Figure 11.1. I recommend that students start with their research question, and the results, and then widen outwards to do the literature review, the methods, and the discussion. The last chapters to be written are the introduction and the conclusions, and the preliminaries such as the abstract and the table of contents**. It is quite possible to be working on the third draft of the results, and the first draft of the literature review**. This helps to give variety to the work.

b. **Aim**: to get the whole thesis written out, with gaps and mistakes.

c. Write or type with large margins and plenty of space between the lines. Every paragraph should have a heading (or a running number under a heading) so that it is easy to 'cut and paste'. Later some of these headings can be deleted.

d. Then search out and add supplementary material, having now identified what is missing through the effort of writing in one continuous draft.

e. Reorganise the headings

Actively set yourself the task of reading ONLY for this point. Ignore all the other things that intrude, such as spelling, which can be corrected later. The goal at this stage is to get the sequence of ideas down, and to identify the gaps which will be filled later.

f. Keep a list of style decisions
Decisions you make should be noted somewhere and kept conveniently available for consultation when working on the thesis. You will soon forget what decisions you have made if you do not do this. In proof reading you check your thesis against this list. Eg is it 'subhypotheses' or 'sub-hypotheses'? Both are possible, both are correct, but you must fix on one variant and stick to it.

f. Edit your work. Is everything there? Is there too much? Should some of this material be moved to a different chapter? Should material be moved to an appendix? **Ruthlessly cut** anything that does not support your argument, but when you do so, **put it in a rejects file**. Sometimes material you reject at this stage you later find is very useful, so cut, but do not throw it away.

7. The second draft
IDENTIFY GAPS — DELETE — EXPAND — COMPRESS — REORGANISE

Aim: to rewrite, and get everything you want to say in reasonable sequence and form. Is the text clear? Is it clearly organised? Where do sentences need the order reversing? Where have I been too concise?

The second draft is the meat of the thesis writing process, and should take the longest amount of time. You are editing mainly for content and clarity of expression at this stage.

Note: you should save everything you cut -- you might decide later to include it, maybe elsewhere in the thesis.

8. The third draft
MAKE THE TEXT SMOOTHER. FILL FINAL GAPS. ADD COHESION

Aim*:* to fill in any final gaps, and to begin to work on continuity between sections. Is the text smooth? Are there any unjustified 'jumps'? Can each paragraph/sentence answer the question ‘so what?’. Are the headings consistently worded? It is at this stage that the introduction and the conclusions are drafted.

9. The fourth draft

Can anything now be cut, or made more concise? Now is the time to give your third draft to a friend for careful reading and comment. Concentrate on detail: punctuation, spelling, cross referencing, consistency eg of capitalisation, use of hyphens. Polish the tables graphs and illustrations. Make sure the page breaks are appropriate. Eg, A heading which is followed by only 1-2 lines of text ought really to be on the next page. It really does not matter if you leave a few blank lines at the bottom of the page.

10. The fifth draft

- Is the style uniformly polished?
- Has everything printed properly?
- Do you have all the pages present, and in the right order?

At this stage remember Watson’s advice to the research apprentice. “The apprentice may be forgiven mistakes, and mistakes are correctable. What will not be forgiven is a manifest indifference to getting it right”. (1987:5).

11. Students must allow time for proofreading

I have seen far too many students rush to meet a deadline, and end up with very little proofreading. Proof reading takes time and high concentration. A 100 page thesis can easily take a day just for basic proofreading, without taking time for corrections. In addition, a thesis needs proofreading more than once. **Poor proof reading means that you will go down at least one grade.** These marks will be lost stupidly, because this is merely a matter of time and concentration. Examiners, rightly, have no sympathy whatsoever with a candidate who has not done the proof reading.

In general, it is best to proofread for 2-3 related features at once, and leave others aside for correction at the next read. This is particularly good advice when later drafts are being worked on.

It takes a lot of time to do proofreading. In addition, the work demands high concentration, and, because a writer is so closely involved with their work, it can often happen that the ability to proofread goes dramatically down, just when the time pressures demand that the thesis be finished quickly.

Proofreading cannot be done in a hurry. Proofreading cannot be done by someone who is tired. Therefore students must so organise their calendar that they allow adequate time for this.

Some of this proofreading can be done on the computer. Use the spelling and grammar checkers. A spelling checker is a tool – use it with care, but do not rely on it. No spelling checker can distinguish between 'red' and 'read' since both are correctly spelled words.

Most of the proofreading needs to be done on a printout. Proofreading on the screen is not good enough. Several students whose work was poorly proofread have confessed that most of their proofreading was done on the screen. Both methods are needed.

Figure 11.2 Proofreading checklist

1. Overall structure, continuity between sections. 'So what?' answered.
2. Headings: consistent wording, punctuation, and lay out (font, underline etc) .
3. Paragraphs:
   a. Long sentences (more than 16 words: use a style checker to pinpoint them!). 'So what?' answered. No ambiguity.
   b. Spelling
   c. Grammar
   d. Tables & figures
   e. Cross referencing
   f. Consistency
      This is especially needed in cases of doubt where you have chosen one way.
   g. Capitalisation of words. Take care to follow the rules, and where there is any doubt, to fix on a style and maintain it.
   h. Page breaks at the right place. Headings at the end of a page are not permitted.

12. Make use of style guides and 'Usage' guides

I was recently surprised to find out that students did not know about the 'English Usage' family of guidebooks. They knew about dictionaries, and many had learned the basics of APA referencing style – some the easy way and some needing more forcible encouragement. But when it comes to the fine points of English, there is a whole family of English Usage style guides, some of which are widely available.

The Usage guides provide detailed help on the fine points such as advice/advise and a host of other details.

The classical texts of course are:

- *Fowler's Modern English Usage* (2004) and
- *Usage and Abusage* (Partridge 1999).
- Particularly useful for second language learners, and for those who speak French is *Practical English Usage* by Michael Swan (2005).
- Collins COBUILD have recently published *English Usage* (2012) also likely to be of interest to second language users given the COBUILD tradition of second language dictionaries and the way that it is aimed at upper-intermediate and advanced learners and teachers of English. Others worth looking at are
- *An A-Z of English Grammar and Usage* by Leech et al (2001).

There is a whole range of internet sources available. For instance, Paul Brians provides online and downloadable versions of his book *Common Errors in English Usage* http://public.wsu.edu/~brians/errors/errors.html.

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CHAPTER 12
ETHICAL QUESTIONS

1. Introduction

In all areas of life, trust between people is a fragile valuable which is easily broken and extremely difficult to repair. Therefore all reasonable steps must be taken to maintain trust between the researcher and the community. "**Anonymity and confidentiality must be discussed** with all individuals who agree to co-operate with social researchers" (Burgess 1984:50 bold added).

Therefore, even when the ideas a researcher may have are quite vague, they must be able to:

a. explain simply and concisely what they are doing and why
b. give some indication of who will see the results
c. give some indication as to how the results will be used and presented.

It is usually possible to be vague, while still being truthful.

It frequently happens than in studying language, a researcher wants to collect examples of people using language without people being aware of precisely what the researcher is looking for, because if they know, then their language will be different. It is possible to explain that the researcher wants to study language, without being more specific, and offering to show the results later. **If you ever offer to produce the results**

later, then you must keep your promise. Since it is quite common for researchers to take far too long to finish their work – or not to finish at all, such promises can easily be forgotten. Therefore every researcher needs to keep a careful record of the promises made, and after the thesis has been defended, **every reasonable attempt should be made to keep these promises.**

Sometimes the individuals and the details of the setting must remain confidential. That means using pseudonyms if necessary. Names, locations, and dates, may have to be concealed, but if this is done you must say so in the writeup. Where it is not possible to conceal a location or a person, then **no information given in confidence must be written up, even if this means the argument is weakened.** Under exceptional circumstances your supervisor may permit you to submit a confidential report to the examiners.

The best way to avoid problems of keeping confidences is by careful research design: the goal is to obtain an MA or PhD, and more sensitive research is best left till later. Try and avoid situations where confidentiality is a problem.

If there is anything in your research that you cannot write about, you should discuss the problem with your supervisor as early as possible.

2. **Written agreements**
Sometimes written agreements will need to be made. In all cases one must guard the tongue, and refuse to gossip. In contrast, usually the relationship of the researcher to their supervisor should be one of client-lawyer, or patient-doctor.

Example 1: a researcher was given permission by the head and the teacher to record lessons in a secondary school. When the head asked to listen to the recordings the researcher calmly and politely explained that the recordings were strictly for personal use in the research and for anyone else to listen to them would be unethical, and if the head insisted then no recordings would have been made. (By implication, if the head had really wanted to hear lessons, the head would have had to have gone personally to them, following the usual access procedures).

Example 2: Burgess in his study of a comprehensive school in England was able to keep the location secret. Another researcher working in the pilot schools in Tunisia could not conceal the location because there were so few of them in the country. Therefore great care had to be exercised not to break confidence. In the end the research was oriented more in a linguistic direction than an anthropological one partly to avoid the tension of being unable to use confidential information.

Example 3: A researcher heard conflicting and confidential comments from several different people who all knew each other. Often the researcher had to feign ignorance and not let on that they had heard something from one of them already. Sometimes what was heard was known to be erroneous, for the researcher had been entrusted with the a fuller wider picture than the person being talking to. It took great personal skill to avoid even hinting at an attempt to correct the statements that were heard. In such situations what was needed was great tact and refusal to even acknowledge that anything was known, and all this without lying! **It is very important that a researcher does not take sides, and is not seen to be taking sides.**

In particular the researcher had to be careful not to take the side of the people the researcher felt closest natural affinity to. This happened when talking privately to the individuals, and when meetings between people being studied were attended. In meetings the researcher had to observe, and only intervene to seek clarification, and when there was a clear misunderstanding of fact**.** The goal in research is to ask questions, to learn, to understand not to give your opinion!

Example 4: A researcher into code switching between Tunisian dialect and French wished to have many examples to study. Is it ethical to secretly record conversations? If it is not done secretly, how can one be sure that the examples are genuine ones? Can the techniques of caméra caché be used?

3. Plagiarism

There are two types of plagiarism and both will be dealt with here.

a. There is plagiarism due to lack of referencing. This is theft from others.

b. There is plagiarism due to missing out and misrepresenting data. This is theft from the reader.

4. Plagiarism defined

Plagiarism can take various forms and happen to various degrees. Plagiarism is the deliberate, or careless copying of someone elses work or ideas, without acknowledgement, and implying that they are your own when they originated with someone else. The basic assumption is that anything without a reference must be your own work.

Deliberate plagiarism is a serious breach of ethical standards, and is the academic equivalent of theft. Plagiarism is stealing the credit for what you have written. Carelessness in referencing can also expose a writer to the charge of plagiarism. Since one of the standards for a good thesis is consistent error-free presentation, insufficient referencing is evidence that a student has not met the professional standard and level required. Here are some reminders.

5. Avoiding plagiarism

a. Ideas and paraphrases must be referenced, as well as actual quotations. It is unethical to use or copy someone else's idea or work and pretend that you thought of it.

b. A paraphrase must be acknowledged. The reasons for this should be obvious. "A reader will assume that any idea not referenced is your own, and that any passage not in quote[sic: ie quotation] marks [or equivalent block indentation] is in your own words. This is a contract which you must respect". (Wray *et al* 1998:241).

> Notice how I have corrected the English and the content of the quotation.
> 1. I have used square brackets to insert my own comments
> 2. I have used the word 'sic' to indicate that the author really did say 'quote' instead of 'quotation' and that I had noticed this, thought it was odd,
> 3. I have signalled that the original really did use that choice of words.
>
> I have also provided extra information – that there is a second way of quoting that does not involve the use of quotation marks.

c. All tables figures and diagrams need acknowledgement, unless they are totally original. You do this for instance by writing 'Based on xxx by yyy' or 'after/taken from/adapted from Bloggs 1990:21'.

d. Inconvenient data needs explaining and accounting for or simply highlighting as being unexplained, thus perhaps needing further research. Suitable phrases are:

. . . the results are inconclusive
. . . the data is against the sub-hypothesis
. . . the data is incomplete, therefore no conclusions can be drawn.
. . . the results are broadly in line with the hypothesis
. . . my data is confusing, therefore further research is needed to establish ...

This is a particular problem with numerical data and the drawing of graphs. The normal approach is to be 'up front' about failures and inconsistencies. The point is that **leaving out information is a form of deceit.** This point will be expanded upon in the section on Statistics.

6. **Avoiding accidental plagiarism**
   Plagiarism frequently happens by accident, because of careless note taking. In taking notes, you should habitually indicate when you are quoting, when you are paraphrasing, and when you are writing your own thoughts. You may forget to note down at the time the page number and other important information. Since even ideas must be referenced, not just paraphrases and quotations, there is little excuse. The rule for a thesis must be: if in doubt, give the reference. Over-referencing is less of a failure than under-referencing.

   Note 1 For examples of plagiarism, and worked exercises in avoiding it, see Chapter 22 of Wray *et al* (1998:241-254).

   Note 2 Avoiding plagiarism is only one side of careful selection of material and ideas. Every argument or statement needs support, and that support should be carefully acknowledged.

NB Rules of plagiarism apply to ANYTHING submitted to a supervisor, even if it is the first draft.

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CHAPTER 13
AVOIDING SEXIST LANGUAGE

Far too many students struggle when they are writing, and use *he/she* or other alternatives. There is no need to struggle: the problem has been solved a long time ago. It requires a change of style.

1. **References**
   APA (1994:50-60) has detailed advice. Gibaldi (1995) has none at all. The notes here are based on Matthews *et al* (1996:138-9)

2. **The traditional approach** has been to regard the generic masculine as including the feminine. English lacks a gender-neutral singular pronoun. The use of the generic masculine is offensive to some readers, and is no longer acceptable in academic writing.

   This change of language is a political decision. There is no linguistic reason for instance why there cannot be multiple senses to the word 'man' eg male only, a group of males and females, or the whole of humanity.

   Below are some possible solutions.

3. Use gender-neutral terms whenever possible

Old	Preferred
man	the human race
mankind	humankind, people
manpower	workforce, personnel
man on the street	average person
spokesman	speaker, representative
policeman	police officer
stewardess	flight attendant
chairman	chairperson, chair

4. Use plural constructions when you can

A doctor should advise his patients	Doctors should advise their patients

5. Replace the third person singular with the article

The scientist typed his thesis	The scientist typed the/their thesis
Each cleaner must be sure that s/he signs his/her time card	Each cleaner must be sure to sign their time card.

6. Try using a direct instruction

A nurse must be sure that she uses disposable syringes	Nurses must use disposable syringes

7. Replace 'his' by 'their'

The word 'their' is becoming acceptable for the singular, especially if it refers to a subject which arguably is a collective.

Each conference participant should have received his schedule	Each conference participant should have received their schedule

8. Use of the passive

The passive can be used to avoid this problem.

When did he write his book?	When was the book written?

9. Rewritten example

I have placed the sentences on separate lines for the sake of clarity. See the next page.

The original said:	**This can be re-written as:**
Was **he** a trained observer of the event?	Were **they** a trained observer of the event?
How competent was **he**?	How competent were **they**?
What was **his** relationship to the event?	What was **their** relationship to the event?
To what extent was **he** under pressure, (eg from fear or vanity) to distort or omit facts?	To what extent was **the person** under pressure (eg from fear or vanity) to distort or omit facts?
What was the intent of the writer of the document?	What was the intent of the writer of the document?
To what extent was **he** an expert at recording the particular event?	To what extent were **they** an expert at recording the particular event?
Were the habits of the author such that they might interfere with the accuracy of the recording?	Were the habits of the author such that they might interfere with the accuracy of the recording?
Was **he** too antagonistic or too sympathetic to give a true picture?	Was **the observer** too antagonistic or too sympathetic to give a true picture?
How long after the event did **he** record his testimony?	How long after the event **was the testimony recorded?**
Is **he** in agreement with other independent witnesses?	Were **they** in agreement with other independent witnesses?

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CHAPTER 14
DEFINITIONS

Definitions are frequently needed in a thesis, and since the French and English traditions differ enormously, this is an important chapter.

1. Reasons for using a definition

a. To differentiate between popular and technical usage

b. To differentiate between usage in different disciplines

c. To differentiate between usage in particular theories, approaches writings of different authors etc

d. To clarify and state how you will use the word from now on in your writing.

2. Use of definitions

This depends on how much something is in dispute, (eg several meanings), how self evident something is, and how important it is. Frequently,

- the meaning of key terms is not obvious:
- there is more than one definition,
- different authors have slightly different emphases,
- it is very difficult to agree on a common definition.

Therefore it is very important that when necessary, key concepts are suitably defined. The literature review is usually the place for this, but not always – it may be more appropriate to consider them in the methodology chapters. For simple definitions, the glossary might even be the best place.

3. When should you provide a definition?

Definitions are most common in the literature review and the methods. They can be needed at any point in the thesis, including the appendixes. They are usually needed when there is more than one meaning. If in your discipline there is only one meaning, and it is simple, then you only need a brief explanation for the sake of those who do not know the subject. But, often, there are multiple meanings, and there may even be significant discussion about them in the academic literature. Therefore you must include some discussion of this, and then take control, and choose one stream of definition, defend your choice, and stick to it.

Usually, lengthy definitions and discussions of definitions happen in the literature review, but in the introduction you may have to mention them. Therefore the concepts could be briefly mentioned in the introduction **with a forward reference** to where they are more fully discussed. Similarly, in later parts of the thesis it can be very useful to summarise and remind the reader where the meaning is explained and discussed in more detail.

4. Examples of definitions

Example 1. Several related words

Context: Situating a thesis in a methodological tradition
This paragraph of definitions began a major section on my theoretical perspectives and principles for doing research.

Quotation (from my PhD thesis)

> Broadly speaking, anthropology can be divided into three branches: physical anthropology with its links with genetics and ethology; prehistoric archaeology; and cultural (USA) or social (Britain) anthropology also known as ethnography. Ethnology is often taken to be equivalent to ethnography, particularly in the USA, but in Britain refers more to the history of peoples. Social anthropology overlaps with sociology particularly where field research is concerned. Ethology on the other hand is a branch of zoology which studies the behaviour of species, often interpreted as the result of evolution moulded by natural selection. (Bullock & Stallybrass 1977: anthropology, ethology, ethnography & ethology).(Lowe 1992 p5.5)

The last reference, Bullock and Stallybrass (1977) is to an encyclopaedic dictionary, hence the format of reference plus keywords, not reference plus page.

Notice here, how at the beginning of a major section of a chapter, several overlapping words are explained. Effectively there are brief definitions, but the style is light and there is no mention of the word 'definition'. I have also managed to summarise material from an encyclopaedia, which in itself was very concise.

Example 2. Defending the choice of a less technical word

Context: The introduction to one of the results chapters
Technically, the chapter should have been called ‘Systematics’ but I chose to use a more well known term, ‘Taxonomy’. Here I give two brief definitions, explain the similarities and differences, and defend my choice.

Quotation (from my PhD thesis)

> 'Systematics' is the study of biological classification, and 'taxonomy' strictly speaking refers to the principles of organising taxa into hierarchies, and looking for evolutionary links. Therefore in purist terms, this chapter should be headed 'systematics'. But in conformity with the Institute of Biology's report on Biological Nomenclature (IOB 1989) the term 'taxonomy' will be used.

Lowe (1992 p16.1) in the first paragraph of a results chapter headed 'Taxonomy', IOB refers to one of the authoritative documents on nomenclature for Biology in schools. It is a report from the Institute of Biology, referenced here as IOB 1989, and the abbreviation IOB was in the glossary). This document had been briefly presented and defended as authoritative at an early stage in the thesis.

Notice how in this case the available choice of two words is explained, and why one was preferred to the other.

In this example the use of the less technical word in the thesis is defended by stating conformity to one of the relevant standards appropriate for the baccalaureate level of biology studied in the thesis.

Example 3 Features analysis of words

Context

Lowe (1992 p9.7) reports observing a biology teacher explaining similar words, and building up a table on the blackboard. The teacher actually chose only two features, for two organisms and their effect on each other.

Parasitism Mutualism (symbiosis) Commensalism	- + + + + 0	Where + benefit - harm 0 no effect

It often happens that there are several related words. One way to compare them is to establish a list of features, and build up a comparative table. In linguistics this is known as a 'semantic features' analysis.

I also find it very curious that although the British biology teacher (teaching a biology class in Tunisia in English) had not been trained in linguistics, she still spontaneously used a component analysis table.

Example 4. Narrowing the meaning

Context

Sometimes a word has an extremely wide meaning and can either have several narrow meanings, or you wish to narrow the meaning for thesis purposes.

Adaptation/Adaption

This can refer to a time of a few seconds as in physiology, or millions of years as in the theories of evolution.

If you wish to restrict the meaning, you may in fact need to say nothing. It is often obvious just from the context of the discipline what narrow sense you use, in which case it needs no comment. If you feel the need, a simple footnote, and perhaps a note in the glossary, is enough.

Example 5. To explain unfamiliar terms or unfamiliar usages
Context
The need to explain the nuances of a French word which is vaguely known to English speakers, and which had a different local meaning

Quotation

> Strictly speaking in France the word 'lycée' refers to the last four years of secondary education. Tunisia uses the word both in the strict sense, and in the wider sense, of post primary education leading to the baccalaureate.

(Lowe 1992 p2.2 footnote 1. Note that this comment is now out of date, since Tunisia has adopted the French style division of a middle school followed by an upper school of the last four years, therefore the word 'lycée' is now used in the same way in France and Tunisia).

5. Using summary definitions as recapitulation and as a cohesive device

a. Important definitions need providing and repeating in each chapter

Each time an important word is first used in a new chapter and at other convenient points, a brief summary should be given, between commas, or in brackets. In effect you make a summary definition as a means of recapitulation and as a means of keeping the argument clear. You also in this way contribute to the overall cohesiveness of your writing.

You must make it easy for a reader to follow your argument, and must assume readers forget, and readers often start reading a thesis somewhere in the middle!

Brief definitions are excellent for recapitulations of what has been established. Note below the synthesis of multiple definitions.

Example 6 Definitions as recapitulation devices
Context
When Lowe (1992) came to write his chapter called "The cornerstone hypothesis" he first had two paragraphs with the sub-heading "Recapitulation". (Emphasis added).

Quotation

> In **Chapter 2** the situation of the English school and the French school was described. **It was shown that scientific language was assumed to be constant** in such a way that the scientific language learnt in one host language would transfer readily into another host language. **In Chapter 3** 'Basic terminology' **'constancy' was explained as meaning similar form and sense**. Also **'scientific language' was defined as** including the science specific component of 'mixed' words, and the specialised words of science. It is this scientific language which was assumed in a field situation to be constant in form and semantic fields, with similar distinctions in French and English between the specialised and mixed terms.
>
> In **Chapter 4**, **scientific language was explained** as referring to the language of textbooks, the language of the classroom and laboratory, and the language required for discussion, reports, essays, examinations and science magazines. **In Zylbersztajn terms scientific language referred to** the science of the curriculum and the science of the teacher. Pre-university science is foundational, concerned with well established statements. Therefore one would expect the scientific language at pre-university level to be more constant than the scientific language of the professional scientist working near to the frontiers of knowledge. (p7.1).

Notice how the paragraphs have many summary definitions, which had been elaborated upon earlier. These summary definitions function as cohesive devices.

Notice also that Lowe used **two short paragraphs not one long paragraph**. In the interests of clarity students must learn to use short paragraphs.

b. Using summary definitions to bring several points together as the foundation for a new point

It is sometimes helpful to bring various definitions together in one place. These definitions may well be explained in detail elsewhere, in which case you should cross reference them. Summary definitions, in order to remind the reader, are often helpful, especially if the point to be made depends upon them. Sometimes a suitable style would be to put a summary definition in brackets with the cross reference to the page with the full explanation.

6. Alternatives to formal definitions

The Anglo-Saxon world generally uses them sparingly, and finds their routine use to be rather odd and unnecessary. Popper in particular is against definitions of words in an attempt to establish meaning, for it leads to an infinite regression (definitions of words mean that the defining words need defining which means that the new words need defining...) and is rather pointless. In the examples given above notice how rarely a formal definition is given. Instead an indirect more readable style is used.

7. The alternative possibilities are:

a. Often it is clear what is meant by a word simply by the way a writer uses the word.

b. Some words in a thesis may need simply defining in a glossary in which you list the words you have chosen to use in a certain way.

c. You give a brief sentence explanation in your main text the first time you use the term. You also repeat the summary definition the first time you use it **in each chapter**. Especially if it is new or unusual, you need to **remind** your reader of the meaning. This is also a help for the many readers who do not read the chapters in order. Many readers will read you discussion before they read your literature review, therefore reminders of meanings are essential. This advice also applies to explaining the meanings of abbreviations.

d. Use a footnote, and cross reference the usage in future chapters to this footnote.

e. Take a section in a chapter and have a full discussion, in which case the fact of defining will be highlighted by the use of a heading.

f. Use a whole chapter, if your hypothesis means that your choice of definition requires a long explanation and that this is central to the line of argument.

g. If a long footnote is required, use an appendix.

What is important is that words are not confused with facts. A new usage does not mean there is a new statement of fact. (Thouless 1974: 77).

It is also very tiresome, in terms of style, if every new word or concept is pedantically defined.

B. Study and commentary on a whole chapter of definitions

1. Introduction

The second chapter of my thesis had a whole chapter – six pages – on basic terminology used in the thesis. This chapter is presented here, with commentary, because in a few pages it illustrates several techniques of presenting definitions as a pre-requisite for the rest of the thesis.

There is a high density of overlapping definitions, from four different research traditions. In each case I chose an authority, and seamlessly wove the definitions together and established working definitions for the thesis.

Cassels & Johnstone were interested in how science students at school learned new vocabulary, and found that technical words were easier to learn than common words with a science specific meaning. Trimble is an authority in ESP. Newmark is an authority in technical translation. Vinay & Darbelnet have published a well known textbook comparing French and English.

For convenience of presentation here I have broken down the sections into shorter parts.

The Table of contents for the chapter

Note, in this thesis I had followed the convention of including the Figures as part of the Table of Contents, and NOT listing them separately.

The introduction

Original Text	Commentary
As has been explained in the introduction and in Chapter 2 'The situation in Tunisia', scientific language was, in the English school, regarded as 'the same' or 'constant'. At no point though was 'scientific language' or 'constancy' ever defined by those involved in the English school. For the purposes of research a greater precision in these terms is required, which is what this chapter provides.	1. A central un-developed point from previous chapters is named 2. Justification for discussion is provided. 3. There is an explicit statement about what the chapter is about.

The assumption was widely held in the English school that scientific language was constant. If anyone knew well both English and French, and knew their science in English then they would have no difficulty studying science in French. At no point was any greater precision made. At least four alternative possibilities can be identified. These are summarised in figure 3.1 below.	1. In addition to the viewpoint about constancy, the implication that was always drawn is stated. This is new information compared to the introduction. 2. It is again stated, because this is important, that local people never were more precise. 3. A table is introduced – as all of them must be. 4. Sometimes it is helpful to present definitions as a logic table, followed by relevant explanation, discussion, and defence of the choice you made – the option you chose.

Expected

NOT expected

Figure 3.1 Alternative meanings for constancy in scientific language

	Same Word	**Different Word**
Same Sense	same word same sense eg French: oxygène English: oxygen	different word same sense eg French: azote English: nitrogen
Different sense	same word different sense eg French: dire, to say English: dire, terrible	different word different sense

In the English school it was assumed that most of the time the same words existed in French and English with the same senses. Occasionally different words existed with the same sense. Similar words having different senses, or different words with semantic fields that did not fully overlap, were assumed either not to exist or to be so rare that they were negligible in importance. This thesis tests constancy mainly in terms of the same word form with the same sense. Sense is taken to mean fully overlapping semantic fields and identical denotations and connotations. The same word form means identical spelling or with only only minor spelling differences.	1. It may seem strange to present a widely accepted and incontrovertible result in one of the literature review chapters without forward referencing. I could speak with authority because of two years field work. 2. Note how the definitions are summarised in a positive then a negative way. 3. Note the reminder of what this thesis does. 4. Here is the working definition of ‘constancy’. 5. I took my own reasonable decision about minor spelling differences.

3. 'SCIENTIFIC' AND 'NON-SCIENTIFIC' When various writers are consulted it becomes evident that there is no standard terminology to distinguish between: a) words which although they are used in science, do not have a meaning specific to science, b) words which have both a common usage in ordinary situations and a different and precise usage in science, c) specialised words used only in science with no meaning outside science.	A problem of lack of agreement on words and definitions is presented by introducing the desired distinctions. This may appear to be 'backwards' but in fact it was driven by intensive fieldwork. I needed these distinctions, and was about to discuss various authors and the existing confusion. The end point was a clear consistent terminology using descriptive terms that were memorable.

A common terminology is to use 'technical' versus 'non-technical' (eg Cassels & Johnstone 1985). In this case there is imprecision concerning the words classified in b) above. Cassels & Johnstone (1985) call the scientific part of b) 'normal English in a science context' (p1) while Trimble (1985 p128) refers to words with a common and a science meaning as 'sub-technical'. Trimble adds to the confusion in that he has a two fold definition of 'sub-technical' as being both words that are in common use between several scientific disciplines, and those common words with a special meaning in science.	1. I began with definitions from research into science lessons in schools – rather than from the field of translation or ESP. This was deliberate, because my research began in the field of research into science education. 2. Notice the critical 'voice'. Cassels & Johnstone support the common definition but this is problematic and why. 3. Trimble works in ESP. Again, fact then assessment.

Newmark (1988 p152-4) says that Paepcke (1975) distinguishes between four varieties of technical language, as in figure 3.2 below.	A table is introduced, Fig 3.2 then commented.

Figure 3.2 Paepcke's (1975) varieties of technical language	
Variety	**Example**
Scientific	chambre de congélation
Workshop level	compartiment réfrigérateur
Everyday usage level	congélateur
Publicity/sales	freezer (as a French word)

Newmark criticises this saying "a scale like this one is likely to be valid only for one or two terms in a few fields". (p153). He then suggests his own scale (p153) based on medical vocabulary, which is presented in figure 3.3 below.	Newmark's assessment. The quotation is used because it is short and unexpected – hence, I am saying, he really did say this. This is a rare quotation. Notice why I needed to quote.

Figure 3.3 Newmark's (1988) varieties of technical language	
Variety	**Example**
Academic	phlegmasia alba dolens
Professional	varicella, tetanus
Popular	chickenpox, lockjaw

Newmark's own criticisms of his scale are that these are general categories to which a word is often arbitrarily assigned; nomenclature is often clouded by obsolete, obsolescent or regional terms; there is a frequent tendency to use a trademark as the name of a product eg 'bic' for 'biro', and there is the problem of eponyms which are not recognised by another country and language. My criticisms are firstly that the distinction between 'academic' and 'professional', at least viewed from a school perspective, is a very fine one: both are technical levels. Secondly Newmark fails to distinguish between common words with no special meaning at all in science, and 'mixed' words which have both a common meaning and a science specific meaning.	Newmark's self assessment. Notice again how I managed to • concisely summarise Newmark • concisely summarise the self criticism of Newmark • present a summary of my own views My assessment of Newmark. It is based upon the distinctions I want: two of his labels are too fine, and another needed distinction which he does not make.
As a translator Newmark is interested in another distinction, that between 'technical' and 'descriptive' terms. He gives the following sentence in English with a possible French translation:	Dealing with another distinction. In this way I have been fair to Newmark, and assessed his work in relation to mine.

The submarine's surface is perfectly smooth, with the forward diving planes, rear rudder and radio and sonar bubbles as the only protrusions. (Newmark 1988 p153-4, Newmark's translation)	On a donné, au sous-marin une forme parfaitement hydrodynamique, seuls les ailerons de plongée, le gouvernail et les dômes longeant la radio et le sonar font saillie.

In the example given, 'smooth surface' is a descriptive term and Newmark argues it ought to be translated by the descriptive term ' surface lisse ' instead of the technical term ' forme hydrodynamique	

But even this so called technical term ' forme hydrodynamique ' to a scientist is a descriptive term. Both components ' forme ' and ' hydrodynamique ' have a scientific meaning in their own right, (depending on the context and discipline, for a scientific word can have more than one precise meaning), and together they form a descriptive technical term. Therefore this terminology of 'technical' and 'descriptive' is not helpful in determining appropriate levels of language used in science. The terminology presented below in figure 3.4 is much clearer, with ' forme hydrodynamique ' being classified as a specialised term and ' surface lisse ' as a mixed term with a science specific meaning.	Here, I as a scientist criticise Newmark's understanding. So, perhaps he just picked a bad example! My own more useful classification of Newmark's example.

There are not enough precisely defined terms to express all the distinctions needed to describe the language used in science in relation to the language used outside science. Part of the problem lies in a failure to distinguish between a term and its meaning. The terminology that will be used in this thesis is presented in figure 3.4 below.	The terminology problem restated. Presentation announced of my own terminology as my solution to the problems follows below.

<table>
<tr><th colspan="4">Figure 3.4 terminology: language in science</th></tr>
<tr><th>Term</th><th>Meaning</th><th>Example</th><th>Language</th></tr>
<tr><td>non-specialised (totally)</td><td>common</td><td>water</td><td rowspan="2">non-scientific</td></tr>
<tr><td rowspan="2">mixed</td><td>common OR</td><td rowspan="2">cell</td></tr>
<tr><td>science specific</td><td rowspan="2">scientific</td></tr>
<tr><td>specialised</td><td>science only</td><td>bacterium</td></tr>
</table>

Note to figure. A 'cell' can be in common usage, a 'room', as in a 'jail'. The word has at least two science specific meanings: in biology as a unit of protoplasm, usually with a nucleus, cytoplasm and enclosing membrane, and in electricity it is a receptacle for generating electricity by chemical reactions, or decomposing compounds by electrolysis.

A clear distinction has been made, as shown in figure 3.4, between words of 'science only' meaning, and 'scientific' words, which in this thesis includes mixed words with a science specific meaning. Similarly 'non-scientific' words are both all those non-specialised words with a common meaning, and the common meaning of mixed words.	Brief explanation of the important points in the figure.

The French authors Vinay & Darbelnet (1975 p65) have used terms which are close to the terms I have chosen to use. These are " mot usuel " (lit: usual word) for what I have called 'non-specialised'; " mot technique déguisé, " (lit: disguised technical word) for what I have called 'mixed'; and " mot technique " (lit: technical word) for what I have referred to as 'specialised'.	Interesting extra information, that some world authorities in a different language have developed similar terminology.
The distinctions are also important for CSL. It is the non-scientific words which are translated in the normal way, and the scientific words which are assumed to be constant. This is expressed in figure 3.5 below, taking English and French as the example languages.	Why all these distinctions are important for the thesis.

Figure 3.5 Words which are translated and words which are assumed to be constant according to CSL		
English	**Relationship**	**French**
non-specialised, common mixed, common	<–translation–> <–translation–>	non-specialised, common mixed, common
mixed, science specific specialised	<–constancy–> <–constancy–>	mixed, science specific specialised

CONCLUSIONS Constancy refers primarily to similar form and sense. A terminology has been established as in figure 3.4 in which 'scientific' words are in contrast to 'non-scientific' words. A 'scientific' term can be either the 'science specific' part of a mixed term, or a purely 'specialised' term. It is these 'scientific' words that were assumed to be constant between host languages, in particular, between the host languages of French and English. In the next chapter the subject of scientific language is discussed in more detail.	Statement of what has been achieved in the brief chapter. Coherency statement linking to the next chapter.

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CHAPTER 15
THE APA AND MLA REFERENCING SYSTEMS

Terminology

Referencing is divided into two parts, and they are labelled accordingly:
In text means how you refer to a source in the text of your thesis and in footnotes and appendixes.
References/bibliography is the full reference in a list at the end of a thesis or article.

1. **Major recent changes to referencing systems**
   a. **MLA**
   There has been a major change in the MLA system since 2009.
   - The end of each reference includes a key word to indicate the media: web, print, E-mail, CD-Rom, DVD, etc.
   - On the other hand, the exact web address is rarely provided in the references since, it is argued, these change, and sources can usually be found if the author and title are known.

   b. **APA**
   The situation with referencing the internet continues to evolve, therefore check authorities on the internet for up to date information.

2. Introduction

For more authoritative information, consult the relevant sites. For the MLA style it is www.mla.org and for the APA system it is www.apa.org .

In practice, the style guide sites are not that helpful. Several universities have made available some referencing guides which are clearer and easier to use. But beware – web sites swiftly become out of date. It is quite common for a style guide to be written then not updated. The problem of information becoming out of date is a very real problem for this textbook. Therefore, in this chapter, the basics of referencing will be presented. The basics are unlikely to change in the near future.

There is one site that seems to be in the lead and this is the OWL site, otherwise known as the Purdue University site and the following link will get you to the summaries for the MLA and the APA styles.
http://owl.english.purdue.edu/owl/section/2/

The OWL site is also an excellent site for advice on many areas of academic writing. For teaching purposes it has an interesting comparison table between three different styles. http://owl.english.purdue.edu/media/pdf/20110928111055_949.pdf
which can also be found on the Citation Style Chart page
http://owl.english.purdue.edu/owl/resource/949/01/

3. A few style families, and thousands of styles

One common misunderstanding is that there is ONE unique APA style, and ONE unique MLA style. This is completely false. It is more correct to say that there are several style families, therefore there is the APA style family, and the MLA style family. In fact, Mendeley (introduced and explained in the chapter 19 on computer tools) announced in their blog on 5 December 2012 that there were over 2700 citation styles in the academic world, and that they had developed a very flexible citations style editor so that the user of their program could modify an existing style and create another. By 1 May 2013 their blog said there were over 6700 styles.

http://blog.mendeley.com/academic-features/make-your-citations-look-exactly-how-they-should-with-mendeleys-visual-citation-style-editor/

http://blog.mendeley.com/academic-features/mendeley-contributes-2000-citation-styles-to-the-open-citation-style-repository-at-citationstyles-org/

For many – students and professionals – the easiest way to establish and maintain a clear referencing style is to avoid the guides completely! The guides can present a convoluted mass of detail. A far easier method is to choose a major journal, or a recent textbook from a major publisher in your field. Choose an article such as a review article that has several hundred references. Follow the style used therein.

So, the basic rule stands: pick a reputable variant which has hundreds of recent examples, and stick to it.

4. All systems

a. For date, choose the 'copyright' date, and note the date of the book you consulted. If necessary add the edition eg 3rd edition 1995. A reprint date is not an edition date.

b. Do not worry too much about matters like: should first names be abbreviated, and if so what is the punctuation. You must pick a style and a variant, then be consistent.

c. Underlining is now rare. Italics are used.

d. Underline (ie use italics) whichever is bigger, ie the titles of books, and the journals for articles.

e. It is safer NOT to use abbreviations. But students should know how to read abbreviations, and how to write them in full.
 eg. CUP = Cambridge University Press.
 eg. *English for Specific Purposes* 15(3)217-232, which is, in full: *English for Specific Purposes,* Vol 15, No. 3, pp 217-232

f. In English, the main words in a title are *sometimes* capitalised (depending on the style), but not in French. For other languages you will need to check.

g. The SPELLINGS must be maintained EXACTLY as given: do not change them to fit your chosen (English) spelling conventions.

h. Almost all books have an ISBN (International Standard Book Number). This is used mainly for ordering books. It is useful information for a source card, but is rarely used in academic documents. Similarly, the DOI system is becoming popular, but is not used in theses.

i. It is often useful for your own reference, on your source card to add a note as to which library has the item, and the reference number in that library.

j. All paraphrases, and allusions, must be given a full reference, just as if there was a direct quotation.

k. Page numbers must be given, for quotations and paraphrases alike.

All paraphrases, and allusions, must be given a full reference, just as if there was a direct quotation.

Page numbers must be given, for quotations and paraphrases alike. For web sources if needed write np for no page. This will avoid the examiner criticising you for missing out a page, and will help the reader.

5. The MLA System

a. **It is used mainly for Literature**. It has the advantage that a clear indication of the title is given in the text. (Not just a date, requiring someone to look up the reference in the bibliography). But it takes more room, especially in that a reference needs to be put in a footnote (for the first time the author is referred to), AND into the works cited.

b. **"The rules for CAPITALIZING TITLES are strict**. In both titles and subtitles, capitalize the first words, the last words, and all principal words, including those that follow hyphens in compound terms. Therefore, capitalize nouns, pronouns, verbs, adjectives, adverbs, and subordinating conjunctions (although, if, because)". Do NOT capitalize "articles ... prepositions ... coordinating conjunctions (e.g., and, or, but, nor, for), or the to infinitives, when such words fall in the middle of the title." (Gibaldi & Achtert 1988:50).

c. **There are commonly two lists**, 'Works cited' and 'Works consulted'.

d. **In the text, use:** Author, title [abbreviated, underlined], space, page number

e. **In a footnote.** It is common, the first time the title is mentioned, to footnote the full reference.

f. **In the bibliography.** NB The full reference of all the texts must be given in the 'Works Cited'. This applies even for the works you have given a full reference for in a footnote.

g. **When an author has several titles,** in the Works Cited, place the works in date order. Some variants of MLA then allow for the second and subsequent reference, the replacement of the author name by three dashes.

h. **When giving the reference in full, the date comes at the end.** See examples.

i. **Subsequent references.** After fully documenting a work, use a shortened form in subsequent notes. The author's last name alone, followed by the relevant page numbers, is usually adequate.

j. **If you cite two or more works by the same author –** for example, Northrop Frye's *Anatomy of Criticism and his Critical Path* – include a shortened form of the title following the author's last name in references after the first. Eg Frye *Anatomy* 278. Frye *Critical* 1-3.

k. **Repeat the information** even when two references in sequence refer to the same work. Remember, the abbreviations *ibid*. and *op cit*. are no longer recommended. (Gibaldi *et al* 1995:200)

6. The APA system

a. **In the text the author's surname*, and date*** in brackets with page numbers where possible, is put in the text. **Optionally, the full title is included, if the style permits. This is an important point.** Some people think that since this is close to MLA style, then it is forbidden in APA. **Including the title in the text the first time a reference is mentioned is not very common in the APA style, but is still acceptable**, and it certainly adds to the readability of a thesis provided it is not over-used.

b. **In the references, the date follows the name** (In the MLA goes near the end).

c. **When more than one work of an author is included,** the oldest work goes first in the bibliography. Where two or more are published in the same year, then the writer arbitrarily allocates a letter eg 1984a, 1984b.

d. **Capitalisation of words.** The rules are less strict than for MLA. The general rule is to follow the normal English rules for capitalisation.

e. **The advantages** of the APA system are that the system is very mechanical, clear, and unambiguous. It has the disadvantage that a reader needs to continually consult the bibliography to gain an idea of the title of works consulted.

7. When confused:

a. Find models
b. State all the information
c. Be reasonable
d. Be consistent

8. Commentary on the examples below

a. Notice how heavily referenced the paragraph is. Every single assertion is referenced, and some statements are given two references.

b. Notice also that ideas are referenced with page numbers: it is not just quotations that need a full reference.

c. There are ten references in this opening paragraph. Each statement is conservative, and is not uniquely the author's opinion.

d. MLA only. When an author has only one reference then just using the name is sufficient - it is not necessary to add an identifying phrase for the work.

Figure 15.1 MLA example of good style This is an adaptation of Lowe 1996:217**.**

It is commonly assumed by teachers of ESP that the language of science is 'international' (Richards p x, Strevens 153) or 'universal' (Widdowson Explorations 23,110). This applies particularly to symbols, and other "non-verbal devices" (Widdowson EST 7) such as "formulae and graphs", (Robinson 24) or "equations diagrams and models of chemical compounds" (Widdowson Explorations 24). Widdowson sees the non-verbals as being a type of interlanguage, which, he reasons, is universal, because they are drawn from a "universally accepted set of conventions" (Explorations 24 see EST 7). Wilson regards mathematics as particularly culture free (29,32), though he does recognise that differences exist in science.

Works cited

Richards, JC.(ed). "Teaching English for Science & Technology". *Selected papers from the Regional English Language Centre Seminar 'Teaching and Learning of English for Scientific and Technological Purposes in SE Asia' 1975*. Singapore University Press. 1976. Print.

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Strevens P. "Special Purpose Language Learning: A Perspective". *Language Teaching & Linguistics Abstracts. 10(3*) :145-163. 1977. Print.

Widdowson HG. "EST in Theory and Practice". *In: English for Academic Study with Special Reference to Science and Technology: Problems and Perspectives*. British Council Occasional Paper, ETIC. p3-10. 1975. Print.

Widdowson HG. *Explorations in Applied Linguistics*. Oxford University Press. 1979. Print.

Wilson B. "The Cultural Contexts of Science and Mathematics Education: Preparation of a Bibliographic Guide". *Studies in Science Education. 8,*:27-44. 1981. Print.

Figure 15.2 APA example of good style (adapted from Lowe 1996:217)

It is commonly assumed by teachers of ESP that the language of science is 'international' (Richards 1976, p x, Strevens 1977:153) or 'universal' (Widdowson 1979:23,110). This applies particularly to symbols, and other "non-verbal devices" (Widdowson 1975:7) such as "formulae and graphs", (Robinson 1980:24) or "equations diagrams and models of chemical compounds" (Widdowson 1979:24). Widdowson sees the non-verbals as being a type of interlanguage, which, he reasons, is universal, because they are drawn from a "universally accepted set of conventions" (1979:24 see 1975:7). Wilson regards mathematics as particularly culture free (Wilson 1981:29,32), though he does recognise that differences exist in science.

References

Richards, JC.(ed). (1976) Teaching English for Science & Technology. *Selected papers from the Regional English Language Centre Seminar 'Teaching and Learning of English for Scientific and Technological Purposes in SE Asia' 1975*. Singapore University Press.

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Widdowson HG. (1979) *Explorations in applied linguistics*. Oxford University Press.

Wilson B. (1981) The cultural contexts of science and mathematics education: preparation of a bibliographic guide. *Studies in Science Education. 8,*:27-44.

9. **There are two other systems, often used in papers, but not suitable for a thesis.**

   a. **The citation order system**
   Each reference is tagged with a number, in the order in which they appear in your text. The bibliography then appears in number order. Some journals allow footnotes and references to appear in the same list. It is a very good system for essays, if the teacher accepts it. It is also very common in medical journals.

   b. **The alphabet number system**
   First arrange the bibliography like the APA system. Then tag each item with a running number, and use these numbers in the text. The system produces a neat bibliography, but it does not give as much information in the text as the APA, and, the bibliography needs to be finished before the final writing of the text.

10. **Brief notes on referencing the internet**
    This is still a rapidly changing area. The best advice I can give is to repeat the advice given earlier, to use the OWL website, and/or a recent journal article or textbook. I will however provide a few observations.

    The MLA no longer require the web reference. This is one example where I think many academics would disagree. The whole principle of referencing is to lead your reader to your source, therefore providing too much information is never wrong. The old advice of providing the web reference – the URL – with the date of access is honest and informative.

    Where a journal has a print and a web reference, then state the official print details first, and then add: available at [provide the URL] with the date of access.

    Remember, while most supervisors will refuse to teach you referencing basics, it is part of their job to adjudicate and help you with difficult cases.

11. Internet references with no author and no date

a. No date is the easy bit: simply include **(nd)** in the referencing.

b. For no author, the title moves to the first position in the references list. For in text use the first 1-4 words, in double quotation marks, followed by the year of publication if known (if not, write nd).

12. Citations organisers

One easy way to get the citations right is to use a citations program. See Chapter 19 for Bibme and Textcite. You might also like to try out the online sites www.workscited4u.com and www.citationcreation.com .

13. The vexed questions of "cited in"

a. What happens when you only have access to a quotation indirectly? For instance, you see that I have made a quotation in this textbook, but you do not have access to my original source, so you choose to quote it anyway. Do you give the original reference, as if you had read all the original article or book? Do you refer to this textbook?

b. The answer for APA style is that in the text, you write something like this:

(Huff 1954:56 as cited in Lowe 2014:xxx)

Note, xxx refers to the page where Lowe 2014 quoted Huff. I have written it xxx because at the time of writing this chapter the page number is not finalised!)

In the references, you only give the source you personally used, in this case Lowe 2014.

c. I strongly disagree with this APA suggestion.

- It could easily be that the reader has easy access to Huff but not to Lowe.
- Perhaps the reader has access to both. In which case, in order to find the details of Huff 1954, the reader has to

use the references list in Lowe 2014.
- The system is therefore NOT reader friendly.
- The system also breaks some fundamental rules of referencing:
  - ** The writer should provide full and complete information.
  - ** The writer should make it easy for the reader.

e. Therefore, I strongly recommend that any writer provides details of BOTH references in the list of references.

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CHAPTER 16
DEFENDING A THESIS and POWERPOINTS

1. The format of the defence

In Tunisia, a student is allowed 15-20 minutes to make a presentation for an MA, longer for a PhD. Usually nowadays students use a Powerpoint presentation, but this is not always necessary, and students are free to also provide handouts.

Figure 16.1
Typical sequence of events in an MA defence

1. The President of the jury opens the examination
2. The Candidate speaks for 10-20 minutes
3. The Supervisor makes some comments
4. The Examiner presents their assessment
5. The President of the jury makes comments
6. The Candidate answers all the required questions and makes a few other comments.
7. The room is emptied and the jury deliberates.
8. The Candidate and the public are invited to return to hear the decision of the jury announced by the President.

The most common sequence of events is presented in Figure 16.1. There can be variations. For instance, points of clarification can be raised and answered at any time. In some defences the candidate replies to each member of the jury separately. In the best defences, a genuine and interesting discussion can develop.

Students are free to choose which comments and questions they wish to reply to, except where they are specifically asked for a reply.

2. **All students are strongly advised to attend a few thesis defences**
   Unfortunately, there is often very little advance publicity about times and dates, so students need to develop contacts with people, and make a serious effort to attend.

   Attending a defence allows you to see what the examiners are expecting, and helps you to write a better thesis, as well as making your defence itself somewhat less frightening.

   Defending a thesis in public is a tradition going back many centuries. Essentially, there are three parts to a thesis: the actual written text, the defence, and subsequent publication. In defending a thesis, a student is showing maturity, and is joining the research community.

3. **What examiners expect**
   Examiners are looking for a balance between self confident autonomy and humility in responding constructively to criticism. They wish to see if a student can make a strong case, orally, and can politely but firmly answer the criticism.

   In considering their verdict, many factors are considered. These can include:

   a. The written presentation of the thesis, with the number and types of error. The thoroughness in attention to detail. Consistency is looked for. Often there are several possible styles: students need to choose one and stick to it.

   b. Does the student have a thesis?

   c. Were the methods used appropriate, and did the results match the questions?

d. Has the student mastered the relevant literature? Can the thesis be related to the literature?

e. Is the candidate aware of the implications?

f. How fluent is the candidate in their presentation?

g. How significant are the findings?

h. Does the thesis tell a story? Does it have a thread of argument? Is there a logical progression of ideas? Is this progression shown clearly in the way the headings are presented? Is it always clear what you are getting at – what point you are making? What is NOT wanted, but commonly seen, is a series of mini-essays which are just a summary of a book or some lecture notes.

i. Has the student mastered the style of referencing argument and evidence? The opinion of the student must be reduced to a minimum. Broad sweeping statements must be avoided. Every claim must be substantiated by references, argument, or fresh data.

Every claim must be substantiated by references, argument, or fresh data.

4. The format of the defence speech by the candidate

Remember that your audience includes visitors who are totally unfamiliar with your work. The examiners too are probably bored with the detail of the thesis, and are expecting to be stimulated and enthused. **A presentation which is interesting to the audience and is clear will make a good impression on the examiners.**

Start by thanking the members of the jury by name. This is easy to do, and will help you to find your voice, get you used to the acoustics of the room, and help you to overcome your nerves.

Begin by announcing the title of your thesis (which will also be displayed on your powerpoint) followed by a brief summary of the context. State the questions clearly, and tell us why they interested you (therefore should interest us). Summarise the findings (do not bore us with detail). **Highlight the most significant findings**, and go into some detail about the implications. This is important: you are not aiming to present all your work – so highlight the main points. You are not able to present all the detail, so only explain the crucial points.

Probably up to a half of the thesis is concerned with methods and results. Yet in your presentation you should concentrate on the main findings and the implications of your work. In other words it is the argument, the thesis that needs clear presentation, not the detail.

While an examiner is speaking, the candidate should take notes, interrupting only for a point of clarification (Excuse me, would you mind ...). The candidate then replies, but is only obliged to answer a question if the examiner says so.

5. The speech should NOT be read from a prepared script

a. Many candidates find making a speech a very frightening experience. So, many of them write out their speech, in full, and read it aloud, paying very little attention to the audience, and generally making a very poor impression on the examiners.

b. Possibly a speech can be written in full in advance, but it must then be memorised. The written text of the speech then serves as a memory aid. Presumably the written text will have a clearly set out system of headings, and lists of points to be made. The candidate is free to pause and consult these notes regularly. They are **not** free to read them out in full.

c. Other techniques are possible. One I have used successfully is to use a sequence of slides. I keep a copy of each slide on paper, and annotate the copy, so that the audience sees the slide, and I have before me a copy with any notes I need.

d. People who make speeches regularly will often write out in full, and memorise, the introduction, the main headings, any key phrases, and the conclusion.

So candidates have been warned: if you choose to read aloud a script they can expect to lose at least one mark.

Powerpoints

Murphy's Law states that if something can go wrong, sooner or later, it will go wrong. In particular, there are two major eventualities that students need to foresee. Examiners will not take kindly to students who rely on a powerpoint and whose presentation is ruined if this aid is not available.

1. **Have an alternative for when the equipment fails to arrive, or fails to work**

   Powerpoints are only a tool, and few students have mastered them. Powerpoints only work well in a room with dim light. Even in winter, bright sun can shine into the room, therefore causing problems. Like all technology, they often do not work. There are all sorts of problems, from not having a long enough extension lead and adaptors, to the bulb breaking, to the projector not being compatible with the computer. Students who use them should allow at least half an hour to set up the equipment, and have an alternative plan. I suggest students have a basic number of handouts ready – more can usually be copied rapidly if needed.

2. **The slides should be prepared assuming extremely poor lighting conditions ie a bright sunny room with no curtains**

3. Good advice

Many students put a lot of work into having very pleasant coloured slides, and then in the poor lighting conditions some or all of the slide is not visible.

a. **Use black on white**, not white on black. If you are not sure of this, follow a golden rule of research - try it out first. Get hold of the machinery and try it out for yourself. Or attend a few thesis defences, and notice what works and what does not.

   The reason for using black on white is simple: it increases the amount of light actually transmitted onto the screen. Simple observation will confirm my advice.

b. **Avoid colour -** it rarely shows up.

c. **Avoid fussy backgrounds**. Most backgrounds confuse the reader. Use only plain text. This may seem humiliating, and it is very tempting to play around with the computer and be creative, but the goal is communication, and extra detail only distracts and confuses.

d. **Do not try and put too much information on a slide.** A common error in all types of visuals is to simply photocopy a page from the thesis. This rarely shows up because the font is far too small. **As a general rule aim for a maximum of 6-8 lines per slide.**

e. **Only put essential information on a slide**. Each slide requires at least a minute of display, and must be commented on. Use phrases NOT complete sentences. Do NOT simply copy something from your thesis.

Maximum EIGHT lines
Phrases – not sentences

4. Which font size?

The site www.thinkoutsidetheslide.com has some interesting advice. The author did some research and some calculations. Here is a version of his table, converted and adapted into metric.

Figure 16.2 Comfortable viewing distances for screens with the 4.3 shape.

Screen width metres			Font size, in points						
	9	12	18	24	28	32	36	40	44
1.0	5	6	7	9	10	11	12	13	14
1.5	6	7	10	13	15	17	19	21	23
2.0	**7**	**10**	**13**	**17**	**20**	**23**	**26**	**30**	**32**
2.5	9	12	16	23	25	29	34	36	39
3.0	12	16	20	27	31	35	40	42	46
3.5	16	20	23	30	35	40	46	52	55
4.0	20	23	26	34	40	46	52	60	64

There are various ways to use the table. The first thing to do is to check on the size of screen you can expect. If in doubt, plan on the standard 2m screen. The next step is to establish how big the room is. If in doubt, assume it is 10m. This means you need at least 12 point.

Figure 16.3 Required font size

Lines	14	12	10	9	8	7
Font size	24	28	32	36	40	44

Given the recommendation that eight lines of text is enough, then clearly you should be using font size 40.

5. **Which font is clearest?**
   By common consent, Calibri is considered to be the clearest font. It also has the major advantage with figures and tables, of positioning the numbers in monospace mode. This may not mean much to many readers. In the days of typewriters, all manual and some electric typewriters gave the same space to all the characters. Then came proportional fonts, in which for instance the letter i took up less space than the letter a. For tables with numbers in them, it is a major advantage to use a monospace font, so that the numbers all line up.

6. **Aim for clarity of content: not a bad impression with glossy visuals**

   Remember you are doing an academic presentation. Your goal is to convey content. Fancy visuals, colour, and other tricks, will only distract, and will NOT help you.

   Why then is there a whole industry to do with visual presentation? Just remember, the industry caters for worlds where the priority is to impress, rather than the priority of information and argument.

   Examiners will be unimpressed with gloss, spin, and pointless distracting visuals. In fact, if you use them it will be held against you.

   This should be a real relief. No one has to spend hours learning how to write a powerpoint. You do not have to spend days on the internet searching for that perfect visual. You have to concentrate on the research skill of clear presentation of content.

7. **An easier way than powerpoints**
   Not everyone has powerpoint software on their computer, or equivalent. Not everyone has time to learn the program. I reckon to know a fair bit about computers and computing, but I have never written a powerpoint. I use a much easier way.

In your favourite word processor, go to page setup. Choose Landscape mode, and 2.5cm margins all round. Then set the font to Calibri 28 point, and you are done! Type, include diagrams etc as usual, then save to pdf. Show the pdf file instead of a powerpoint. Note, I find it convenient to include a page number to keep track of them.

Easy. No frills, high speed, nothing new to learn, and you will impress your examiners and the public for your clarity and readability.

It takes courage to be simple. It takes courage to take the easy but unpopular way. But you will reap speedy and ample rewards.

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CHAPTER 17
CRITERIA FOR A THESIS

It is important that students know what is expected of them. Therefore, the criteria for a good thesis are very important. They merit careful study before starting, and before each time a thesis is re-drafted. Make sure you understand these criteria, and ask your supervisor for clarification if needed.

A. Short definition of a Masters thesis

1. A masters thesis is an initiation into serious experimental research. A good thesis shows that the writer can produce an extended piece of work, in perfect English, which respects the standards of form and structure.

    > The master's thesis is a carefully argued scholarly paper of approximately 12,000 – 13,000 words (roughly 50 pages). It should present an original argument that is carefully documented from primary and/or secondary sources. The thesis must have a substantial research component and a focus that falls within arts and science, and it must be written under the guidance of an advisor. As the final element in the master's degree, the thesis gives the student an opportunity to demonstrate expertise in the chosen research area.

    http://draper.fas.nyu.edu/object/draper.program.thesisguidelines

2. Different subjects have different traditions. It is the subject specialist/supervisor who has the definitive word. This particularly applies to the choice of topic, and the format of the

thesis.

3. For all disciplines, a masters thesis is data driven/practical. 'Data driven/practical' will mean different things: the concept is much broader than using questionnaires or interviews. For Literature it might well be the application of a theory or approach to a minor author (ie something new is achieved). It is NOT a critical review of existing knowledge/literature.

4. In all subjects, the research needs to be small and precise and do-able/feasible within the time permitted.

5. For further reading

http://www.iuj.ac.jp/gsir/thesis/evaluation.html

The Advanced Masters Program. MA thesis handbook. School of Education. DePaul University 2004-2005.
http://education.depaul.edu/_downloads/forms/MA_Thesis_Handbook.pdf

B. Short definition of a PhD thesis

1. A doctoral thesis is the culmination of three years full time work. By definition, it should be publishable in whole or in part. This means that the candidate has mastered the thesis genre, has written an original evaluation of the relevant literature, innovatively collected and analysed data, and presented the work in such a way that the thesis advances the existing knowledge on the subject. 'Knowledge' in this context does not just mean has assembled more data. There must be a significant link to theories in the subject, and a PhD advances the theory. That is why for instance that evaluating lessons, or evaluating curricula is not a suitable project for a thesis.

2. A doctoral thesis is proof that someone is now ready to enter the community of those who are capable of doing publishable work independently. The defence is also important, since it is a test of how well the candidate can present their material and argue their case in the face of sustained comment and criticism.

C. Overall evaluation grid for Masters, and PhD

Grade	Existing system	Comparable British system
Très bien	a. Near perfect defence b. Near perfect thesis	A few Extremely minor corrections by hand permitted on the existing copies.
Bien	Defects in the oral or one or two areas	Correct the referencing mistakes and other minor errors. Rewrite no more than one chapter.
Assez Bien	Significant defects in the oral and/or in three or more areas	Significant re-writing and editing needed.
Passable	Serious problems in BOTH the speech, and the thesis	A complete re-write needed possibly including new experimental work.

Note. Very rarely, a student is adventurous and goes beyond that which is normally expected. When they do this well, then there can be greater tolerance for some of the weaknesses.

D. Comparison between Masters and PhD

Feature	New Masters	PhD
1. Length	50-80 pages excluding preliminaries, references, and appendixes	300 pages or more, excluding preliminaries, references, and appendixes
2. Abstract	Publishable standard	Publishable standard

3. Overall thesis presentation

a. Respects the norms of the thesis genre.
b. The parts are in the correct order and in rough balance.
c. Few errors of English, presentation, or referencing.
d. There is a coherent readable argument and progression of ideas.
e. There is a high level of consistent adherence to an approved style of presentation.

Note: There is some flexibility in format. For instance, some theses have one chapter for results and discussion, whereas others keep these chapters separate.

4. Referencing

a. Only a few minor mistakes.
b. Every important point adequately referenced.
c. Does not over-rely on a few references.
d. Over-referencing is better than under-referencing.
e. Only the references given in the text provided in the references.
f. Every single reference in the text provided in the references.
g. One variant of the APA style chosen and used throughout. The easiest way to do this is to choose one journal, such as the Journal of Applied Linguistics, or the ESP Journal, and follow the style and style sheet guidelines. Reputable style handbooks can be used.
h. The number of references is rarely in dispute. Some subjects naturally have more references than others.
i. References are appropriate. This has a wide meaning.
   1) References are correctly evaluated for authority, accuracy, etc.
   2) Newspapers and Wikipedia, in certain contexts, can be used, but how they are used depends on the context and what weight the reference is given.
j. References are reasonably up to date.

5. Topic and originality	
*At MA level it is not expected that the topic will be very original. But, the topic must not be simply a repetition of existing work. *Theses are data driven. A more theoretical project belongs to doctoral work. *Validation work, where students extend existing work, is to be encouraged *The topic must be interesting and worthwhile, ie it must not be banal, and not merely a restatement of the obvious.	*The resulting thesis must be publishable in whole or in part *Validation work is possible as a beginning but a Ph.D needs something more and original *The thesis must present something which is new, and significant, and of interest to the research community.

6. Level of English

a. British or American English, but not mixing the two styles.
b. Academic English, with no inappropriate informal forms.
c. Perfect spelling and grammar.
d. Total avoidance of ambiguous sentences.
e. Subject/verb agreement should never be a problem.
f. The whole thesis should be understandable to any final year English undergraduate.

7. Audience and readability

a. The target audience is the final year English graduate - irrespective of the speciality. Anyone with an interest in your subject should be able to follow your thesis. There is a tendency to write the thesis at the level of research articles for specialists in the subject. This tendency must be firmly resisted. It is never wrong to be clear. It is possible to write a specialist text about a subject following the specialist structures and format, and still - without being condescending - be understandable to the general public.
b. A thesis - especially the literature review - should have a distinct thread or story line. It is this thread which improves readability.

8. Abstract

a. Follows one of the recognised styles. For instances:
   1) Swales' three move 'create a research space' framework.
   2) Introduction, Methods, Results, Conclusions.
b. Perfect English

9. Introduction

a. Addresses a final year English student - not a researcher.
b. Briefly presents the research question.
c. Outlines the methods that will be used to answer these questions.
d. Briefly presents the structure of the thesis.
e. Unlike the abstract, the main findings and conclusions are not mentioned.

10. Sequencing of ideas

a. A thesis should tell a story. There should be a clear thread.
b. From the beginning the subject of the thesis should be clear.
c. All the material must have clear explicit relevance to the thesis.
d. Each chapter should have the cohesion sentences and paragraphs that inform the reader of what has been achieved, and what now needs to be achieved.

11. Literature review

*20-25 pages *Short review of the relevant literature. Depth can be limited. Sidetracks rarely followed up. Critical stance required, but less demanding and deep than a doctorate. There is less requirement for originality. *Since the literature review can be modified even towards the end of the writing process, a higher standard is expected here than for the decisions taken in the methodology.	*Usually over 30 pages *Concise but extensive and thorough appraisal of relevant literature. Depth required. Sidetracks adequately but concisely covered. High expectations for the critique. Originality is expected.

a. The review should be a ‘critical’ evaluation of the following:
   1) the discipline.
   2) the topic.
   3) the theories.
   4) the leading players and authorities.

Note, it is rarely necessary to start a long way back in the textbooks. If desired, then it can swiftly be done in concise heavily referenced summary sentences. The references can be to the main detailed expositions, including textbooks and review articles.

Note, by ‘critical’ I mean the older academic sense of discerning, evaluating, linking, and putting in context. I do not refer to ‘Critical Discourse Analysis’.

b. A literature review is not a textbook. Neither is it mainly a list of some articles and books which are evaluated one at a time. **A literature review must involve the weaving together of material**. The thread must be obvious and never lost.

c. Sidetracks will be identified as such and speedily and authoritatively dealt with. Footnotes are an excellent place for these.

e. At the end of the research review the reader will have a clear and up to date grasp of the foundations of the thesis.

f. In other words, **the focus is the discipline-topic-theories-players and the argument. It is NOT the existing literature *per se.*** The literature mentioned is merely the clothing for the content and argument. This is a difficult idea to grasp. It can perhaps best be grasped by studying carefully the literature reviews in the top journals such as the Journal of Applied Linguistics.

g. Only relevant material should be reviewed. It should always be obvious to the reader why this particular literature is reviewed, and why this idea is important. Students must ruthlessly cut material that is not directly and explicitly relevant. Relevance should be explicitly and strongly linked to the research hypotheses.

h. Relevance must be communicated explicitly - the reader should not have to work this out for themselves.

i. The reader should never have to ask these questions
   *why is this included?
   *Why is the author telling me this?
   *So what?

j. The reader should never have to look forwards or backwards in the thesis in order to pick up the thread or to answer the above questions.

12. Research questions or hypotheses

*Testable/measurable in this country	*Testable/measurable.
*Data collection in a few weeks.	*Data collection can take place over a year.
*A very limited amount of questions	*A coherent set of hypotheses, with all of them tested

a. Choose ONE style. Either a series of questions, or a series of hypotheses, or a series of questions.

b. The questions must be answerable. That means they need to be worded in such a way that data can be collected which answers these questions.

c. Students must show they have known and evaluated the interaction of all the variables.

13. Methods	
*Longitudinal work not possible	*Limited longitudinal work is possible. Extensive case work is possible.
*Small samples with low validity tolerated	*When methods involving sampling are used, then larger samples and work of high validity is expected.
*Since these are decided upon early on in the apprenticeship, this is the one place in the thesis where standards can be lower. Even if later, with hindsight, poor choices were made, the thesis should be acceptable provided insightful explanation and remediation is provided.	*A doctoral student has already passed through the MA apprenticeship. Students have time to learn more advanced and sophisticated methods. Careful use of pilot work should indicate other major problems. Theses with serious methodology problems are not acceptable and may mean examiners require a candidate to do more experimental work. This is extremely important, because new experimental work is a serious setback, whereas extra details in the literature review or discussion are relatively easy to add later.
*Methods measure/test the hypotheses	*Methods measure/test the hypotheses

Methods continued

This is often the weakest part of the thesis. It is particularly difficult because often decisions are made at an early stage when the student is inexperienced. Once made, the decisions cannot easily be changed. Therefore it is very important that students study the principles of methodology before launching out.

a. The methods must correspond exactly to the research questions.
b. Most problems could be avoided if students decided how they were going to evaluate the data BEFORE collecting it. Therefore, methods of data analysis must go hand in hand with the methods for data collection.
c. Considerations of validity and reliability must be addressed at the planning stage.
d. A good researcher reasons from the larger population to the small population.
e. A good researcher at an early stage identifies and controls the variables.
f. The methods chapter should address two questions:
    1) Which methods were used. Some references to the literature on methodology can with profit be used.
    2) Why was each method used. Students need to learn to take decisions. Research includes facing the unexpected. Whatever decisions are taken need justification.

14. Validity/ reliability	
Limited validity and reliability is usually acceptable.	All theses should show a major concern for validity and reliability.

15. Results

a. The raw data, such as copies of the questionnaire, belong to an appendix - which needs suitable cross referencing in the results chapter.
b. The main findings are presented. The material is factual and inferential, with little discussion or opinion. Note, referencing is rare in the results chapter.

16. Discussion

a. The research questions are re-visited, and the results commented upon in their light. Personal opinion should be kept to a minimum but it is permitted provided it is justified.
b. The research findings are compared and discussed in the light of the literature.
c. Very rarely, new literature is introduced.

Note 1. In some theses the Results and the Discussion are one chapter, in which case, a clear distinction between fact and interpretation needs to be maintained.
Note 2. In doctoral theses, the Results and the Discussion may be divided up into several chapters.

17. Conclusions

a. There is a summary of what has been achieved using a careful balance of confidence and humility.
b. There should be a short balanced statement about the limitations of the research.
c. There should be a few suggestions made for further research. These suggestions should be precise, objective, and firmly based in the existing research.

18. Publishable	
If not directly publishable, it should be potentially publishable (with for instance more depth, greater sample size, more than one method, consideration of other variables and other related theories). The best MA theses are publishable.	By definition a PhD thesis must be publishable in whole or in part in a reputable peer-reviewed journal. This is commonly taken to mean forming the basis for two articles, or be publishable as a book by a peer reviewed academic publisher. The thesis should make a significant contribution to the advancement of knowledge in the field, and indicates that the candidate has acquired the skills needed to function without supervision at this high professional level.

19. The defence
The defence speech should be in perfect English. It is meant to be an interesting presentation of the main points coupled with a mature and balanced assessment of the work. The candidate should respond well to constructive comment and questions. No candidate should ever read their speech, though they are allowed to consult their notes. Powerpoints, if used, should be ultra-clear and only convey the main points. In view of technical problems, students should be prepared to defend their thesis without using a powerpoint.

Note: powerpoints are often used as a crutch. It is extremely difficult to make a good speech using a powerpoint effectively, and in my opinion many students would do better without the powerpoint.

E. Variations in theses

1. Number of chapters/sections to a thesis

a. In theses the following structures are common

Option 1	**Option 2**
Introduction	Introduction
Literature review	Literature review
Methods	Methods
Results	Results and discussion
Discussion	Conclusions
Conclusions	

In all cases, the distinction between data and commentary must be clearly maintained. Sometimes it is more appropriate to provide a detailed commentary interleafed with the results. In other cases, it is more appropriate to have separate chapters.

b. Other possibilities also exist

For instance, particularly in a PhD, there could be:

1) Several literature review chapters, where the literature review covers two or more distinct areas.
2) Separate chapters for the research question, summary of findings, assessment of validity and validity, etc
3) Several methods chapters
4) Several results chapters
5) Several discussion chapters

c. It is the content itself which determines chapter length

But, some candidates miss out a key area of research, or they are needlessly wordy, or they are too concise.

2. There are considerable variations between departments and between individual professionals as to what is considered to be acceptable style. In this manual I have argued that you need to choose one style, be able to explain and defend your choice, and, supremely, be consistent in maintaining your choice.

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CHAPTER 18
COMPUTING

Note.
This chapter is probably the one that needs the most frequent updating. Therefore, to make life easier for me and readers, there is a section at the end – Updates. So please do read this chapter backwards!!

French-English terminology
Working with the terminology of computers can be a pain. Many people have a Windows in French, but most of the advice is in English. Therefore, it is good to know that Microsoft have standardised their terminology, and rapid explained translations can be found at:
https://www.microsoft.com/Language/en-US/Search.aspx

Beware PUP – Potentially Unwanted Program

Many free programs, even reputable ones, often come packaged with other programs that you do not want. They are sometimes difficult to avoid.

1. Use the source site – the original publisher, instead of a download site, because even some reputable ones are full of PUP.

2. Make sure you read carefully when you are installing

3. UNcheck the boxes permitting the extras,

4. Where possible do a 'custom install' and make sure they are not hiding there.

User Beware.

Introduction

In this chapter I will present a lot of practical advice for using and maintaining a computer. Useful programs are in the next chapter. Finding and evaluating references is in Chapter 21. Skilled users should probably skip through this chapter and read only what is new. Others should probably read this chapter carefully. I have observed that many students say they have taken courses in the use of the computer, and the use of Microsoft Word, but there are huge gaps in basic knowledge. I hope you find this chapter helpful whatever your level of expertise.

> I assume you are using Windows 7. Sometimes I will also just provide the names of the programs rather than give the websites. This is because links change rapidly, and the reader can easily find the link using a search engine.
>
> I have tried to write for a wide audience. If you still do not understand, then you have several solutions
> - Ask a knowledgeable person
> - Google it
> - Read around the subject

Good sites for information

There are many sites, and some will give misleading information. So the old principle stands: **double check anything you read**. Having said that, some sites are more informative than others, and those that go into detail are more likely to be trustworthy. These are some of the sites I go to regularly.

- http://dottech.org/ A good site for reviews
- www.giveawayoftheday.com/
  Give Away of the Day. Check it daily, and then check the comments. you will find these when you follow the "Proceed to Download" link. In these comments look out for the free alternatives. The comments by Ashraf and Giovanni are usually very interesting. The one catch is that you have to install that day and you cannot reinstall another day. The free alternatives are often more interesting than the one being offered.

- www.makeuseof.com
  This has loads of comparison reviews.
- http://www.sevenforums.com/tutorials/ A large selection of Windows 7 tutorials and an excellent forum
- http://windowssecrets.com/ Good source for reviews
- http://windowssecrets.com/forums/ Nice collection of forums with strict policy of politeness.

A. Backups – general introduction

Introduction

A sociology researcher and lecturer once recorded over twenty full interviews over a period of two years. He realised that he needed to make a backup copy of them, so he put the cassettes in the back of his car and drove home. En route home he stopped for five minutes in order to buy some cigarettes. While his back was turned his car was stolen. The car was later recovered, but without the cassettes. He lost two years work.

- Laptops are easy to steal and there is a ready market for them.

- It is very easy to make a mistake and delete some important files.

- Computers seem to be very fragile – four years of life seems quite long, and a hard drive can fail without warning.

Therefore, backups of data are vital. And the easier you make the backups method the more likely it is you will do it. The more you can make a routine of backup the more likely you are to do it.

A student told me how helpful this insistence on backups was. On the way home from showing me something on her computer, she was robbed. Fortunately she had just done a paper printout, and had emailed important documents to herself.

There are in fact two parts to backup. Firstly, you need to backup your documents, photos, videos etc. This is usually quite easy to do. Secondly, you need to backup the computer itself, with its operating system and programs. This is known as a **system** backup. It is usually more complicated.

1. Ideas for document backup

The best backup for documents is a printout.

a. **Set your word processor to automatically save the file you are working on every 10 minutes** or so, to avoid a lot of loss due to power failure or other mistakes.

b. **On a regular basis, save Word files to a different file name**, using the **Save As** command. This will remove a lot of the junk information that inevitably collects in Word files which are repeatedly saved and corrected. It will also reduce their size and make them more readable on other computers.

c. **Use a file series**
Before you start on your day's work of modifying a file, begin by changing the name. For instance, the first time I worked on this chapter I named the file it as Chapter18a.docx. The next time I opened the document, I used **Save as Chapter18b.docx** and in this way began working on another version of the same document. Later I can easily go backwards to a previous version, and if I mess up the new file, I always have the old one to work with. Sometimes you can also set your program to make a series of backups. Google it!

d. **Keep some rejects files**
When you are editing a document you often want to delete sentences, or even several paragraphs. A few days later you may regret this and want to re-use the deleted paragraphs. So open a new file and save your rejects. This is especially important in the results section of a thesis.

e. **Email yourself your day's work**
At the end of your day's work, email yourself the files you have worked on. If you want to, create for yourself an email which you use uniquely as storage.

f. Upload your work to Dropbox. Google docs, Skydrive or or something similar

Dropbox is a free site where you can upload data. You can specify private folders and public folders, and you can use it to back up folders of data. There are other similar free sites.

2. More than one backup

People who are serious about backup have at **least three backups** and one of them is either using the internet – the so called, ‘in the cloud’ method – or uses ‘off site’ storage where you keep one set of backups in another house.

a. Memory sticks

Some people use these extensively. But, they often go wrong since they are quite fragile, and they are easily stolen. Memory sticks are great tools for sharing large files. They are poor tools for backup.

b. Copy to a CD or DVD

CD and DVD blanks are cheap. If you do not have a lot of data you can easily burn a series of CDs, one per week for instance. But, the quality is also poor, and you cannot rely on them. This method is now dying out.

c. Copy to an external Hard Drive (HD)

External hard drives are becoming cheaper all the time. They come in three kinds:

1) Portable, 2½ inch
2) Prefabricated 3½ inch
3) Make it yourself, usually 3½ inch, but 2½ inch is possible.

The sizes refer to the size of the hard drive. Basically, 2½ inch drives are the type used in laptops enclosed in a case and with a small cable which uses one, or sometimes two USB slots on the computer. They do not need a transformer to run them. The Portable kind are very convenient, but in my experience can easily go wrong.

The 3½ inch size is much bigger, and heavier. So much so that they are commonly referred to as bricks! In addition, they need a transformer. But, the drive size is inherently more reliable, and the prefabricated kind ie a drive inside a tough box with a transformer, seem to work well.

Some people make their own external backups. Literally, you buy your own hard drive – the kind used in Desktop computers – and you buy a box, and fit the drive into the box. Often the sales staff will do this for you.

But, once again, buyer beware. Most of the cases are robust but not all of them. And if you ever end up buying several boxes, take care to label the boxes and the transformers because while the transformers may look alike they are not and you can easily destroy a whole HD if you get it wrong. I write from experience.

Recommendation: use a mixture of backup strategies. A daily one for work in progress, a regular backup of all the data, and, less often, a backup of the computer system itself.

NEVER rely on USB-powered external hard drives, regardless of how appealingly portable they might seem. One forum expert said "I've never yet encountered a mains-powered external hard drive failure; with USB-powered drives over the years, I've probably lost count."

The small USB-powered drives often go wrong when they are disconnected. The ONLY safe way to disconnect them is a complete powerdown. That means you need to completely turn OFF your computer – not just put it into hibernation.

d. **Use cloud backup**
Provided you have less than 2Gb of data files you can set up Dropbox to backup your files in the background.

3. **Data backup and System Backup**
Windows, and the programs you have installed, are known as the ‘system’. Experienced computer users also back up their system, so that if there is a computer crash, or the computer is infected with a virus they cannot clean, then it is possible to restore the computer from a previous system backup.

Now, this is when life begins to get complicated. Data backup is fine. A whole system can be backed up onto another external HD and restored from that. The trouble is that when you backup a system you usually backup all the files on the computer ie programs and Data. If you ever need to recover the system you will also copy back the older data files which were part of the system backup. I repeat. Making a backup of the System requires you to copy the whole drive, and this takes time, so is not done very often. That is why the two drive solution is the best.

I recommend that, if possible, you use the two-drive solution. Experienced computer users frequently buy a computer with two hard drives: a smaller HD for the system – the system drive, and a larger HD for the data – the data drive. In this way you back up the System drive and the Data drive separately. In many laptops you can replace the internal DVD with another hard drive.

Another complication is that many programs, including Word, automatically save files to part of the system drive in an inaccessible and non-memorable place. You have to make sure when you use the two drive solution that you save files in a folder on the Data drive.

Where two drives are not possible, there are two other solutions.

- USB3 is becoming popular, and you can store your data on a USB3 external drive.
- You can 'partition' a single hard drive, so that the System is on the first part ie Drive C, and the Data is on the second part, probably labelled Drive D. There are big discussions about whether or not you should partition a drive. How to do it is beyond the scope of this textbook. This means you will have a separate partition for data backup. But this solution still does not overcome the problem of a system backup, because in Windows 7 onwards, to do a system backup you have to backup the whole hard drive. Go figure!

4. **Backup programs for the System ie Windows and programs**
The choice here for free programs is relatively limited. The better programs make what is known as a system image. This means that you can take your external HD to another computer and read it. You can also plug it in to your original computer, and using the correct key (for instance F8 or F12) you can boot to your external System copy, and so test it to see if it works! Then, in case of disaster you use a 'boot CD' or 'boot USB' to start the computer, and copy over the external drive to the internal drive. How to boot from external media depends on your computer, and you can probably find some youtube videos to help you, as well as the detailed manual from the computer manufacturer if it exists.

Believe me, System backup works. On a computer with two hard drives I first of all spent several weeks installing programs, and tweeking various settings. Then I took an old spare HD and I backed up the System drive to it. I labelled it 'first good'. Three years later when the computer was in a real mess, instead of re-installing Windows, which would have set me back to square one, I copied the 'first good' disk from the past back on to the computer, and I had a good as new machine, with most of the installed programs. All I had to do then was Antivirus update, Windows Update, and some program updates.

Programs and links

For a nice review see:
www.makeuseof.com/tag/5-ways-to-clone-and-copy-your-hard-drive/

- **EaseUS Disk Copy Home**
  This is a free disk/partition clone software for home users only. Regardless of your operating system, file system and partition scheme, through creating a bootable CD it can sector-by-sector copy you disk to assure you a 100% identical copy of the original one. It is a perfect free tool for Data Recovery Wizard to recover files from a backup disk.
  http://www.easeus.com/disk-copy/home-edition/
  Take care though. Some are reporting problems. If it interests you, google something like 'problem easeus'.

- **Xxclone**
  This copies (clones) your Windows system disk onto another disk with the system files, installed applications, and all of your data files. It is an ideal tool for periodic system disk backup on a regular basis. It makes the target disk Self-Bootable that can replace your main disk.
  http://www.xxclone.com/iproduct.htm

- **DriveImage XML**
  This is an easy to use and reliable program for imaging and backing up partitions and logical drives even from drives currently in use. Images are stored in XML files, allowing you to read them them with 3rd party tools.
  http://www.runtime.org/driveimage-xml.htm

- **Keriver 1 Click Backup and Restore**
  Backs up the operating system while you are using it. It can makes incremental or differential backups after the initial full backup (i.e. only back up the changes which occurred since the last backup or the last full backup.). Multiple snapshots are possible: you can choose whichever snapshot to revert your

system to.
http://www.keriver.com/oneclick_free.html

- **To create a personal Windows boot/repair disk**
  First make sure you have a blank CD or DVD ready in your burner. Now go Start>Control Panel>System>Action Centre >Backup and Restore, then click on 'Create a system repair disk'. Or even quicker Start>Maintenance>Create a system Repair Disk.

  For other ideas see:
  www.techfleece.com/2011/03/05/how-to-create-a-system-repair-disk-for-windows-7/

5. **Backup Programs for Data**
   Here, we are spoiled for choice.

- **GFI Backup**
  GFI Backup enables you to perform backups to multiple devices, among others, internal/external hard disks, NAS devices, CD/DVD/Blu-Ray media, memory sticks and removable flash memory devices (USB drive, memory sticks, etc). Can also backup on a network. Supports Incremental, Differential and other backup methods.

- **FBackup 4.8**
  Backup automatically to any USB/Firewire device, local or network location. This magic FREE tool uses ZIP64 compression (meaning it can create zip files over 2GB in size) and, unlike most (paid and free) backup software out there, it is capable of making a mirror without creating unnecessary folders.

- **Paragon Backup & Recovery 2012 Free Edition**

- **EaseUS Todo Backup Free Edition**

- **Personal Backup**. Good for backup of your important files and folders)

- **Comodo Backup**
- **Cobian Backup 11**
- **FreeFileSync** is excellent and free.
- **SyncBack.** Easy, simple, light, automatic, powerful.

C. Files and file types

1. Introduction

This section should not be necessary, but experience shows me that it is. For some reason, basic computer courses seem to leave out this information. Here I review the different types of file on a computer, what they do, and which programs use them. Crucially, these file times are labelled, and knowing the label system is very useful.

2. File extensions = file labels

Most file names have a suffix, which means a period followed by 3 or 4 letters of a label. These file labels/extensions are reasonably well standardised. Knowing how to read the label will tell you which file type it is and be a guide to which program to use to 'open' the file.

3. How to see the file extensions

For some crazy reason, Microsoft decided that the default view of files is to hide the 'extension'. Microsoft felt that the ordinary user did not want to be bothered with this level of detail. But, file extensions provide important information, and many viruses can be hidden, because some extensions are more dangerous than others, and if you recognise the file as dangerous because of the extension you can avoid doing something dangerous.

For instance, a virus spread by using the label **I love you.txt** but the real filename was **I love you.txt.vbs** and vbs files are a programming language known as Visual Basic Script which was executed immediately. Anyone who had turned ON file extensions could see that there was a 'double extension' and that the last extension – the one that counts – was dangerous, and so would avoid that file.

Here is how to turn ON file extensions. I assume you have a computer working in French.

Panneau de configuration > Option des dossiers > Affichage

You will then see a series of checkboxes. To see the file types you have to uncheck this box, so that it looks like this:

☐ Masquer les extensions des fichiers dont le type est connu

4. Dangerous file types

The most dangerous file types are programs. The most common extensions are .exe and .msi though there are others. If you see one of these files, perhaps in an email, or when browsing, then do not click on it! Clicking will cause the file to run, ie to start working! In fact, user behaviour is one of the main reasons why viruses spread.

If you find you do click on the .exe file, then hopefully other lines of protection will kick in. You could also quickly exit your browser. Note, lower case or capital letters are the same.

.exe	machine language
.msi	microsoft installer
.com	machine language
.vb	Visual basic script
.vbs	Visual basic script
.vbe	Visual basic script-encoded
.cmd	batch file - windows
.bat	batch file - dos/windows
.ws	Windows script
.wsf	Windows script
.scr	screen saver
.shs	Ole object package
.pif	shortcut to dos file plus code
.hta	hypertext application
.jar	Java archive
.js	Javascript script
.jse	Jscript script
.lnk	shortcut to an executable

Based on:

www.pcmag.com/encyclopedia_term/0,1237,t=dangerous+extensions&i=40709,00.asp

You do not have to know what all these extensions are. You do have to know enough to recognise the extensions as potentially dangerous.

5. Other common useful file extensions

a. Documents

.txt Raw text, without any extras that give for instance underline and bold.
.doc Word 2003 and earlier Word format, also used for other programs.
.docx Word 2007/2010 etc documents.
.odf Open Office documents
.wpd Word Perfect documents
.pdf Adobe Acrobat documents

Note: .doc and .docx files also easily carry viruses, so run a virus check on any file sent to you.

b. Images and pictures

.gif
.bmp
.jpg/jpeg

c. Internet

.htm/html
.mht Used by Opera and Internet Explorer.

d. Audio

.wav
.mp3 This is more compact

e. Video

.avi Large, but still used for video editing
.flv
.mp4

f. Other

.xls/xlsx Microsoft Excel spreadsheet
.ppt Powerpoint

D. Firewalls, antivirus and computer security

1. Introduction

a. All firewalls monitor the connection of the computer to the internet. This means that they protect you from the outside, and also protect you from programs on your computer that want to connect to the internet when you do not want that to happen. For instance, I once had to turn off my firewall in order to do something difficult on my computer. While it was off, a Microsoft product which was throttled by the Firewall and forbidden internet access sprung into action, and before I knew what had happened had installed an update and in the process touched my printer settings so I could no longer print. Imagine if there had been a virus which had sprung into action and invited its friends onto my machine and done even worse damage!

b. Most firewalls have other levels of protection. For instance, they usually have program control. If a program starts running that you did not authorise, or is not normal, then the firewall will either block it, or ask you a question and give you the choice to block or allow. They will also warn you when a program wants to do something unusual or dangerous. You can change your mind later. My antivirus/firewall usually recommends blocking, and checking first on the forum. I rarely do, but probably should take the 1-3 days wait to get things checked.

Windows 7 comes complete with its own, very basic, antivirus and firewall. They are apparently reasonable, free, and have the advantage that they rarely go wrong and rarely interfere with the rest of the computer. Opinion varies how good they are. In my view you are better off trusting an independent specialist program. Microsoft in general cannot be trusted. Many people though prefer more powerful tools. In addition, this section covers the main virus threats and how to avoid them, and what to do if you think you have an infection.

2. **Summary of the basics**. All these are explained later.

- Do not use a single 'administrator' account. Set up a 'user' account and work from there.
- Turn ON reveal extensions
- Turn ON automatic Windows Updates
- Uninstall Java
- Uninstall Adobe Acrobat reader and use an alternative
- Uninstall Flash and live without it if you can or use Chrome for those sites since Chrome has its own version of Flash which is more limited and is updated faster than the other Flash.
- Avoid dangerous sites
- Do not open unexpected email attachments, or click on links in emails
- Regularly update the browser and other programs, perhaps using File Hippo or Secunia update.
- Consider using a more powerful firewall and antivirus
- Uninstall Silverlight

3. **One time tasks**
   In this section I will cover several easy steps which only have to be done once. **If you are not sure how to do these, then get someone to help you or google the problem.**

   a. **Run as user, not administrator**
      If several people share a computer, you probably already have several 'users' set up. This means that each individual can personalise the screen etc. At least one of these users will also have full administrator privileges. The

idea is that even the main person who normally uses the computer does so by logging in to another account with 'reduced' privileges. This means for instance that to install a program, you will be asked by Windows for an administrator password.

The reasoning behind all these complications is excellent. Many viruses begin by installing themselves, and to do so they require 'administrator' privileges. If the user does not have these privileges then they cannot install the virus.

But, many sole users of computers do not bother to make other user accounts, and they run their computer full time as an administrator. Such a user is vulnerable to attack. So, the general advice is to avoid the problem and run as a user with reduced privileges. A big advantage of the firewall Online Armor is that the user can choose to run any program in guest mode. I have therefore protected all my browsers, Microsoft Word, my media players such as VLC and others that might want to access the internet.

It is easy to set up another user. Go to the **Control Panel** (**Panneau de configuration**) and select **Comptes d'utilisation** and from there set up another account, give it a name and do NOT give it administrator privileges. At the same time, password the administrator account. Then when you use the computer you start using this other user, and if you install a program and you are asked for administrator privileges you supply the password just for that event, and carry on.

b. **Turn ON the visibility of file types** (as explained above)

c. Uninstall Java

Most Windows computers come with Java preinstalled (not to be confused with Javascript – something different). The company that runs Java is very slow to offer patches. Also, the updates often leave behind the old versions which means you are still exposed to a virus. This makes Java an easy and very common target for virus writers.

The irony is that very very few computers actually need Java. **The easy solution is, uninstall it!**! If you do need it for a short period of time, then grab the latest version, install it, then uninstall it when you have finished. When you uninstall Java, why not also check to make sure it is all uninstalled. To do this google **java uninstall tool** and follow the instructions.

ed Uninstall Adobe Acrobat Reader and use an alternative

Many people are surprised to learn that one of the main targets for viruses is the Adobe Acrobat Reader. The virus spreads in a pdf file, and acts when the file is opened by the reader.

The simple answer is to uninstall the reader, and to use an alternative. This way you can safely open most pdf files. Google **alternative pdf reader** such as Foxit, Pdfxchange, Nitro or Sumatra. These are discussed later in this chapter.
http://maketecheasier.com/6-alternative-pdf-readers-for-windows/2011/05/13

www.makeuseof.com/tag/6-pdf-readers-windows/

e. Use an alternative browser

Most viruses attack the browser provided by Microsoft called Internet Explorer. You cannot uninstall Internet Explorer because it is needed for the Windows system itself. But you can avoid Internet Explorer, and avoid it like the plague, except for doing Windows Updates. Use an alternative browser such as Firefox, Chrome, and Opera, or Vivaldi.

Chrome is very demanding on a computer, but is built for safety, and because it has a variant of Flash built into the browser you can safely browse the news sites that use Flash even though you have uninstalled the dangerous Adobe Flash. Some people use Chrome only for the news, and Firefox or Opera for other sites. Firefox now has inbuilt flash. Opera in the last year has changed ownership, and has moved to being abysmal. If you have an old version of Opera, Version 12 or variant, then keep it. The new versions have taken away many of the features known and loved. Fortunately, there is now an Opera clone that provides the speed and functionality and customisability and features the old Opera users loved. It is called Vivaldi.

f. **Turn on the modem firewall**
Many people are surprised to learn that the modem has a firewall built in to it. This is known as a hardware firewall, and is a very important part of the defences. Ignorance means it is often forgotten. What is worse, my experience is that it is often turned OFF by default. This means that when you first get the modem, the firewall inside it is not activated.

To activate it you usually have to use your browser to access the modem, type in the administrator password, then find the firewall settings and turn them ON. The easiest way to do this is to take the modem back to the technician at the dealer. Or you could get a friend to help, or you could phone the help line of the internet provider and they should step you through the process. When you have finished, why not do a test of your firewall at a site like https://www.grc.com and look for the "Shields up" page and do some tests. With one reservation. Do not worry too much if you fail in a few details. Over aggressive pursuit of security can make things worse.

g. **Change the passwords in the modem**
Malware is now sneaking in via the modem, and few bother to change the passwords.

4. **Regular updates**
   a. **Microsoft patches**

Microsoft usually issues the updates on what is known as 'Patch Tuesday' ie the second Tuesday in each month. Apart from automatic update there are two more options. Firstly, you can set the Updates to 'notify' when updates are available. Many people use this setting because it does provide you with reminders. It is very common to have problems with installing the patches. Most problems can be reduced by a clean 'cold boot' ie a total shut down – not hibernation – and a restart. This cleans up the computer. Then, before doing anything, you do your Windows Updates and probably allow the computer to reboot. If there are problems you can usually use 'System Restore' to roll back the computer to a time before the updates, then research the problem, and choose to install one patch at a time. This is tedious, but I have had to do it once when my computer almost froze after installing some patches. Also, System Restore does not always work, which is why it is important to do some backups before applying patches.

Avoiding problems with updates

Most Windows Updates and other programs will give far less problems if you first of all do a cold re-boot. This means exiting Windows and turning off the computer fully – not just hibernating, and re-starting Windows.

A word about **Net framework**. This is a group of programs that are sometimes needed by other programs. If you need one of them then the installing program will install it for you. They are a known to give a lot of people problems with updating. When they cause problems, then google the solutions. One easy step is to selectively choose to install just a few of the updates at a time.

b. New advice since Windows 10

Until 2015 I recommended most users to turn ON automatic Windows update, and let it happen in the background. For those with a basic computer, and few extra programs, this usually worked well. **But a year ago Microsoft started imposing the change to Windows 10**. It basically did so by stealth. It cost people a fortune to download up to 6Gb of files in the background then people were confronted with a screen telling them the computer would be modified, like it or not, with no obvious way to stop it. As such, the updating was functioning like a virus.

Even Internet Explorer was used as a backdoor to oblige updates. The latest version has its own, hidden, update checkbox. You had to know about it and disable it to stop Internet Explorer update.

Fortunately some unselfish programmers saw and solved the problem. The GWX Control Panel
http://ultimateoutsider.com/downloads/
This is an excellent small program which will detect any signs of infection and get rid of them, then successfully block the Windows 10 download and install process**.** Which means that in practice you should be able to continue to do the regular security updates, at a time which suits you, with little fear.

Many people now regard patching as more dangerous than the problems patching should solve. I subscribe to the RSS feed for 'Woody on Windows'. Follow the links from this page:
http://www.infoworld.com/

Incidentally, the way to stop Windows 10 downloading too much and then demanding you stop what you are doing and let the changes take place is to set the Wifi connection as Mobile/Remote.

c. **Use a file update program to regularly check for updates of other programs**

There are three easy, centralised ways of checking which programs need updating, then following their advice.

1) **File Hippo**

The Update Checker will scan your computer for installed software, check the versions and then send this information to FileHippo.com to see if there are any newer releases. These are then neatly displayed in your browser for you to download. Please note that not all programs are supported. Also, there are a LOT of false positives, and 'beta' versions are pushed.
www.filehippo.com/updatechecker/

Bookmark www.filehippo.com
At the top of the page there are the latest updated programs, and you can get them from here. You can find others elsewhere on the site.

When you go to a program, it also has all the previous versions, which can sometimes be difficult to find. Another useful source for information about old versions is:
www.makeuseof.com/tag/10-websites-download-older-versions-software/

2) **Secunia Online Software Inspector**

The Secunia Online Software Inspector, or short OSI, is a fast way to scan your PC for the most common programs and vulnerabilities, thus checking if your PC has a minimum security baseline against known patched vulnerabilities. Note, the online version does not support all the programs. For that you will need the offline version. Unfortunately, at the time of writing, **this online version requires Java – which is a dangerous program and should only be installed if absolutely necessary.**

http://secunia.com/vulnerability_scanning/online/

3) **The Secunia Personal Software Inspector (PSI) – Offline**
   This is a free computer security solution that identifies vulnerabilities in non-Microsoft (third-party) programs which can leave your PC open to attacks. Simply put, it is a program you install which scans software on your system and identifies programs in need of security updates to safeguard your PC against cybercriminals. It then supplies your computer with the necessary software security updates to keep it safe. The Secunia PSI even automates the updates for your insecure programs, making it a lot easier for you to maintain a secure PC.

   You need to play with this. Personally I find the version 1-5-0-2 to be easier to use than the later versions and hopefully this older version can be found by googling.

c. **Use Belarc Advisor to check updates and provide other interesting information**
   The Belarc Advisor builds a detailed profile of your installed software and hardware, network inventory, missing Microsoft hotfixes, anti-virus status, security benchmarks, and displays the results in your Web browser.
   http://www.belarc.com/free_download.html

   This is a program I also install and run on any new computer so that I can get essential information about it. One nice bonus is that many of the software licence codes are also revealed. The results can be saved and printed.

5. **Firewall and Antivirus**
   I have already said that the basics provided by Windows are pretty good these days. The market is also one that changes, therefore only basic advice can be given here.

What you do depends in part on how knowledgeable you are. If you are not good with computers then you will want an easy product. For this, an 'all in one' works well, and you will want one that is user friendly. But, most of the free material is separate: you will need both.

a. Free Microsoft Products

For the ordinary user, the products supplied by Microsoft are a reasonable first start before you have time to install anything better. The trouble is that they are NOT turned on by default. You will need to google two items:

- Microsoft Security Essentials – this is the antivirus
- Windows Firewall. Make sure it is turned on. For this look for *Panneau de Configuration>Pare-feu,* or simply type '*pare-feu*' into the search box you see when you click on the bottom left button '*Démarrer*'.

b. Uninstalling other antivirus/firewalls

Many computers come pre-installed with something like Norton, then it stops working after a few months. The best thing to do is then to uninstall it and use something else. The trouble is that security products have to embed themselves deep into the system, and it is rare that a simple uninstall will work. When you try to install another product the installation will often refuse, saying that there is another product already installed (you cannot have two products installed simultaneously) even though you have just uninstalled it. When this happens there are two solutions.

1) Google and find a specific uninstall tool. For instance, Avira openly advertises a 'cleanup' tool.
2) Install and run The free AppRemover utility which enables thorough uninstallation of antivirus and security software and public file sharing applications from your computer. http://www.appremover.com/

This is actually VERY important. For instance, I was trying out Avast, faced problems with it – it gave me a Blue Screen when I booted, the so called Blue Screen of Death, or BSOD/BSD error. By complicated time consuming means I had to remove all traces of the program to get back normal Windows.

c. Firewalls

Google **best free firewall** and see what you get. I trust these sites

- http://www.makeuseof.com/tag/free-firewalls-windows/
- http://www.techsupportalert.com/best-free-firewall.htm

My first choice for amateurs is **Zone Alarm.** I personally use **Emsisoft Internet Security Suite**. The company in 2015 killed their flagship product, one of the best firewalls ever produced. I like it because it gave me a lot of control. They offered me a bargain change to their new product, and gave a reduction because the 'delivery address' was outside Europe. I paid the three year subscription. Then, when I bought a laptop, I was allowed to buy an additional two years and apply it to two computers for no extra cost. So now I have two computers with six years credit on each. Wow.

The new product has the power of the old products without the detailed control, and it rarely asks my opinion, so they have worked hard on an interface that suites a power user and an ordinary user.

Comodo comes highly recommended and is best suited for power users.

d. Antivirus

- www.techsupportalert.com/best-free-anti-virus-software.htm

There are several good Antivirus programs. The problem is that though Avast has come near the top for years, especially in being light on resources, it is also known for being too powerful, and for giving BSOD errors ie the dreaded blue screen when you boot. Before trying it, make sure you do a system backup, have the application remover installed, and know how to boot into safe mode (which usually avoids most problems) so you can uninstall properly. Avast also provide an uninstaller, but it works ONLY from safe mode as I know from experience. Reader beware.

"Users who run Avast's security software should be aware that their surfing habits are tracked by a company called Jumpshot who creates statistics based on visited websites, as Avast recently announced. These might be impressive and interesting statistics, but keep in mind that once data is sent to countries with different legislation, there is little control left on what really happens with all the information. Avast's installer also preserves the right to submit usage data without specifying further what that means."

e. Second opinion scanning – Malwarebytes

That is right! No system is perfect. You cannot have two firewalls, or two antivirus products running at the same time, but there are extra free products which you can use to do a second opinion scan. Among the best used to be Malwarebytes. You run it on demand and it often traps problems which an antivirus has missed. If you can afford the Pro version, it also resides as a resident extra online scanner, like an extra antivirus. I used to find it incredibly useful, and it has effectively blocked unexpected dangerous links in websites. But, it forcibly updated itself to version 2 – that in itself is a malware activity.

Any program that insists on self updating, and does not allow you to delay or refuse the update, is malware. It is a highly dangerous practice that has resulted in:

- Newer disliked versions being installed
- System crashes
- Unable to start the computer
- Leaves the door open to criminals who will imitate or piggy back on the update process

User beware.

Twice I tried to cope with this change. Each time I was locked out of my own computer. The first time, 'system restore' quickly helped. The second time I could not even boot to safe mode, so I had to use a Windows Rescue Disk, and from there was able to access System Restore.

Malwarebytes as a second opinion engine is now Malware. I cannot take the risk of testing the latest version to see if that continues to give problems.

Solutions to the auto-update programs

1. Try to see if there is a setting you can use to turn it off
2. Use an alternative program
3. Use your firewall to block internet access for that program. This only works if the program itself does not need internet access!
4. If available, use a 'portable app' version.

f. Online Scanners

An easy way to double check, or fight a virus, if you have internet access is to run a full scan from a specialist website:

- ESET's Online Scanner http://go.eset.com/us/online-scanner/run/

- Microsoft's Safety Scanner
  www.microsoft.com/security/scanner/en-us/SysReq.aspx

- Trend Micro's HouseCall
  http://housecall.trendmicro.com/

But, can you really trust these online companies with your data? Much better is the solution below.

g. Scanners from a boot CD/USB

If you get a bad infection, then the normal antiviruses will not work, because many viruses are capable of evading or even blocking the antivirus programs. First try the online scanners above. If this fails, then use an antivirus boot CD program. On a clean computer, download the 'avira rescue disk' or the AVG rescue disk . Burn to a CD or USB. Then go to the infected computer, boot from this disk/USB and do your scanning.

- www.avira.com/en/support-download-avira-antivir-rescue-system

- www.avg.com/us-en/avg-rescue-cd

- http://www.emsisoft.com/en/software/eek/ This is the Emisoft Emergency Disk which is completely portable and works from a flash drive.

h. Portable scanners

There is a whole world of ‘portable apps’ ie portable applications/programs. These programs do not have to be installed. Instead, you can set them up on a memory stick and run them from there. Computer technicians use them because it means they have their own toolbox of favourite non-infected programs they can use on the computers of others.

Portable antivirus scanners exist. Google them! One of them.

6. **Alternative pdf readers**
   As mentioned above, Adobe reader is a magnet for viruses. There are several alternatives, including Foxit, Nitro, and Pdfxchange viewer. Some even allow you to make notes on top of a pdf file, which is excellent for adding a comment, or copying and pasting the URL onto the document and saving it so that in future you can remember where on the web you found that file. Check out these alternatives!

http://maketecheasier.com/6-alternative-pdf-readers-for-windows/2011/05/13

http://www.makeuseof.com/tag/6-pdf-readers-windows/

I particularly like Sumatra, which comes in a portable version. It is extremely fast, and, joy, it can read other files such as mobi, djvu, chm etc – the files used for portable documents for the e-readers.

On a regular basis I use the powerful pdfxchange editor and viewer. This program has changed my working habits.

- I can make comments on a pdf file, just like when correcting a Word file. I can have text bubbles, or actually type into the text. I can delete and add pages.
- I can copy parts of most pdf files. This means that when reading a book or article and preparing a lesson, I can copy and paste sentences from the texts without needing to retype. This has really speeded up my lesson preparation.

E. Computer customisation and maintenance

1. **Cleaning**

   The insides of Desktops and laptops get dirty with dust. At least once a year you need to clean this out. For this you will need a cannister of compressed air. NEVER use a vacuum cleaner because these machines create static electricity that can severely damage a computer. For instructions, google it. There are probably even some videos.

2. **SpeedFan**

   This free program will tell you the temperature of your computer core – the CPU, and the Hard Disk. It will also give you various levels of report about the state of your hard drive.

3. **Recovery and undelete software**

   Note, you probably need to be familiar with several of these programs because none of them is perfect, and one will succeed when the other fails. All of them need to recover files to a different partition or different hard disk.

   a. **Redo http://redobackup.org/**

      Most backup and restore programs require your system to be up and running in order to restore. But what if you cannot boot into Windows? What if you have a nasty virus, and you can't even open Windows to try to restore it back to how it was?

      Redo does not need Windows. Download and burn a bootable disk, (by double clicking and following instructions), place it in your CD-ROM drive, and reboot your machine. The system will load a complete mini operating system with a point-and-click user interface into your computer's memory, without writing any information to your hard drive. Then you will be able to perform backup, restore and recovery actions even if you aren't able to boot into your regular operating system.

b. **Recuva**
This is a great little file recovery program, working at two levels, easy, and deep. It even exists as a portable version you can put on a memory stick!
http://www.piriform.com/recuva/features/portable-version

c. **Pandora Recovery**
Another excellent program, with a really easy Wizard that steps you through the recovery process.
http://www.pandorarecovery.com/

4. **Uninstall software**
One problem with new computers is that they often come pre-installed with a pile of software (ie programs) that are not needed. These programs do not simply take up space, they often work in the background at odd times, and generally slow down a computer. A similar problem exists when the computer is used by the family and a pile of games are installed, settings are changed, and the games are no longer used.

Microsoft provides a place for listing all your programs, and uninstalling the ones you do not want. This is in the **Control Panel/ Panneau de Configuration** and called in French **Programmes et fonctionalités**

There is an easier way. Install and run **Zsoft Uninstaller**. It is quicker, easier, and has several advanced functions such as searching for remaining traces of the program after the uninstall.

5. **Managing Startup programs**
Every program and its grandmother wants to start up automatically at Windows boot. Why? To combat this there are several programs such as **WinPatrol, AnVir Task Manager**, **Autoruns** (detailed) and **Startup Inspector**(less detailed).

Startup programs are programs that are automatically started by Windows when the operating system starts. The problem is that many programs, viruses, hijackers, spyware, and other malware set themselves to start automatically when Windows starts. As more and more programs are started automatically, your computer's valuable resources are drained, causing your computer to operate slowly.

Windows has a built-in controller, called **MSConfig** but it is a dangerous program if you are not sure how to use it. In addition, some firewalls such as **Online Armor** have a very detailed list, and **Ccleaner** (see below) has a restricted list.

However, there is one problem with trying to control what programs/processes start at Windows boot and which ones don't: You need to know exactly what the program/process is before you can decide if you want it running or not. This is where two sites come in useful. They maintain detailed lists of over 20,000 Startup Applications. Each database will allow you to search for programs that you find starting automatically on your computer and determine if they are considered to be malware (harmful), optional, unnecessary, or necessary to run.

To examine your computer for programs that are automatically started by Windows, you can download and install **Autoruns** or one of the other programs above. You can then search for entries found in the programs output using this database to determine if the program should be running. If from the information you decide they are not necessary to run, you can uncheck that entry in the Autoruns program and it will no longer start.

http://www.bleepingcomputer.com/startups/
http://www.pacs-portal.co.uk/startup_search.php

6. **Windows housekeeping**

   Windows, and Word etc scatter data and temporary files all over the computer. Many of the temporary files are never deleted, so the junk and clutter just builds up. One way of coping, in one easy place is to use **Ccleaner**. It is free, highly controllable, and is usually fairly light. There are other programs out there that do a similar job and they can be too aggressive and therefore cause problems. There are three major parts. The Cleaner does what it says – cleans up temporary files, and gives you total control by presenting a long list of labels with checkboxes. Go ahead, and delete the browser temp files etc. The Registry cleaner is to be used with caution. Many experts say it does more harm than good but my experience is that I need it, and the registry cleaner is cautious and only cleans what can safely be removed. The Tools section gives an easy list of programs you can uninstall, a list of Startup programs you can control, easy access to System Restore, and Drive Wiper for securely wiping free space on a computer.

7. **Unjamming Windows – a tip for everyone**
   Sometimes, something goes wrong in Windows. For instance, you cannot start a program because it says that it is already running, but it is not! Or, one program will simply not shut down when you want it to. At this point most people are forced into doing a reboot. Before you do that, there is a trick that works on all versions of Windows. In order, press Ctrl-Alt-Del and choose **Ouvrir la gestionnaire de tâches** and you will see the active programs that you can forcibly close.

   For more advanced users, install **Process Explorer** by Sysinternals but now owned by Microsoft. So as to make it available at all times, choose a shortcut key *(touche de raccourci*) which can be set when you right-click the icon on the screen. Its main use is to see which programs are working on your computer. If one of them suddenly jams, then within Process Explorer you can forcibly close that program.

8. **Nirsoft Utilities**
   This is a free collection of very useful utilities which is completely portable. Many are very advanced, but some are not. None of these utilities need installing – you just put them in a folder on your computer and assign an icon to it. You do this within the file manager (Ordinateur, or Windows Explorer) by right-click the file and follow the "Envoyer vers" to Bureau (créer un raccourci).

   You can either download the utilities you need, or download one package, which gives a tabbed interface, with each tab providing many programs under that heading. The package can be found here http://launcher.nirsoft.net/ and is known as Nirsoft Utilities Suite. The launcher also allows other suites and programs to be included. My favourites include:

- **WhatInStartup** – disable/enable/delete programs that are loaded at Windows startup.

- **MultiMonitorTool**– the only tool I have found that copes with situations where you have more than one screen. In these cases sometimes a program window gets stuck. With this tool I can move the stuck window onto the main screen and therefore take control of it.

Updates

1. **DesktopOK.**
   Sometimes the icons on your screen go crazy. This is especially true if you work using two screens as I do. Several times this neat free program has saved me loads of time. You run it, and allow it to save your Desktop configuration. You can supply your own label for it. Then, when things go crazy, open up this program, click 'Restore' and a few seconds later you are back to normal.

2. **Diskmgmt.msc**
   If you find that an external drive is not recognised, or if a partition disappears, or if you want to change drive letters. The easiest route is to use the Windows disk-management tool to check the partition configuration. In an admin-level account, enter diskmgmt.msc into Windows's start, search, or run box (depending on the version of Windows you're using). The Disk Management console will open.

   Note, this is dangerous if you do not know what you are doing. Do NOT touch anything to do with the C drive. The other changes can probably be changed if you get them wrong.

3. **Reading pdf files on a tablet or e-reader?**
   - Many files, but not all, can be re-flowed to make it easier to read. See
   www.howtogeek.com/69481/how-to-convert-pdf-files-for-easy-ebook-reading/

   - I also use **ktopdfopt** which is a standalone program which resizes files for various readers.
   - Use **Calibre**. This program is great in its own right for converting between different e-reader formats.
   - **Coolmuster**
     As someone said: "I used Calibre to make ePub books from PDF files, but I get the terrible quality in the output ePub books, Some days ago I stumbled upon yet another ebook tool that deserves its place on this page:

Key features:
– Build ePub eBooks from 5+ popular formats (.doc, .pdf, .html, .txt, .mobi, etc.)
– Preserve the original text, images, graphics, etc. in ePub eBook.
– Convert a 500-page document to ePub eBook in less than 1 minute.
– Fully compatible with almost all popular portable devices, including iPad, iPhone, iPod touch, Nook Tablet, Surface, PSP, Sony Reader, etc.
Yes there are plug-ins to remove DRM from all the major formats except iBook lit format. Do a search for Apprentic Alf removal tools. They work beautifully with Calibre.

4. **Searching for files and within files**
   - **Windows Grep.**
   - **SearchMyFiles** is a standalone/portable program which has very customisable searches, including duplicate files and text search within files.
   - **Use the search within a good file manager.** I use Free Commander XE. You can search within files, and easily set criteria such as date before/after/between.
   - For documents, I highly recommend **Mendeley.** You choose which folders to index and monitor. Mendeley is a free program mainly for articles and books and enables you to build up a document database exportable in various referencing styles. You can use the built in pdf viewer or your own, and type comments on the pdf files. Zotero also does this, but is a bigger tool.
   - **Glorious Dos.** For finding files, I use the easy way. Dos text files. I create simple text files using the dir/s *.pdf >pdflist.txt and open the file pdflist in a text editor or spreadsheet.

5. Information about your computer

a. SPECCY by Piriform

Piriform, the same company that gave us the very useful program CCleaner. Speccy is COMPLETELY FREE for home users and has no nag screens or ads.

Speccy tells you most anything you want to know about your PC and uses very little resources to load and after quickly loading, uses only a very small amount of RAM.

Speccy features: S.M.A.R.T., drive temperature, SSD info, processor specs including temperature, motherboard specs including temperature, RAM specs including temperature, network specs, operating system specs, etc., etc.

Visit the website http://www.piriform.com/speccy/screenshots for more info.

It is a very small program, does not install ANY services and runs on-demand, as you wish.

b. Others

1) **CrystalDiskInfo** –
http://crystalmark.info/software/CrystalDiskInfo/index-e.html
(portable version available at
http://portableapps.com/apps/utilities/crystaldiskinfo_portable)

2) **HDDScan** – http://hddscan.com

3) **DiskCheckup** by Passmark –
http://www.passmark.com/products/diskcheckup.htm

4)**EASIS Drive Chec**k –
http://www.easis.com/easis-drive-check.html

6. **File synchronisation**
   Whenever you have two computers or two devices such as a tablet and a computer, it is often important to synchronise one or more folders. That means to make sure both are similar, and updates on each are transferred to the other. Here is what I discovered on a forum.

- **Create Synchronicity** (light , about 220 kB zipped)
- **PureSync**
- **Synchredible**
- **AutoVer** (http://beanland.net.au/autover/)
- **DirSync Pro** (http://www.dirsyncpro.org/)
  AutoVer is good for real-time backups with version control, a feature that DirSync Pro also can perform but with a lot more overhead. AutoVer also handles the problem of real-time backing-up of MS Office files which are in use at the moment of synchronizing.
- **Dsynchronize**
- **FreeFileSync,** found at http://www.freefilesync.org/. Recommended by some, but others say it comes with inbuilt malware. User beware.
- **Syncredible**. Said to be the market leader in this particular sector. Synchredible continues to be free of charge to domestic users. (And no, there aren't two different versions, one paid-for, one not: domestic consumers get the exact same software as commercial customers.) It has one of the best User Manuals I've ever encountered — large print text used sparingly on lots-of-white-space pages — and it synchronizes at not far short of the speed of light thanks to a patented engine that certainly isn't to be found in any other program of this type.

  Actual operational options for this particular program can seem a little daunting but the superb User Manual is easy to read and easy to follow. At set-up, then, it's but a matter of moments to walk-through the step-by-step wizard and specify the source of the data you wish to backup, the destination where that data is to be copied, and user-chooser refinements such as skipping files with identical time stamps, synchronizing files with different content only (rather than continually synchronizing files that have never been changed), ignoring hidden files/folders and deleting files/folders that continue to exist on the destination drive but no longer appear on the source drive. (Note: Synchredible sends that data to the Recycle Bin; if after synchronization you think you might have made a mistake with the original source deletion, just open the bin and click 'restore': the software hasn't erased it irrevocably.)

7. **Pdf resize**
   A useful online place to resize your pdf files. Suppose you are sent a file and the margins are too small. This site will keep the same page size and resize the text to suit your margins. It works the other way round. Suppose you have a file with 5cm all round margins and want to make it 2cm all round, so increasing ALL the text slightly. This site works. I use it to prepare this book.

   http://createpdf.neevia.com/pdfresize/ I found it worked, provided I filled in the boxes such as Scale (tick) Constrain Proportions (tick) and Center text.

Lowe I 2016a. A first textbook of research methodology and thesis writeup for second language English speakers. www.scientificlanguage.com Version 1.1

CHAPTER 19
USEFUL PROGRAMS

Introduction

The last chapter was at times a little technical, and covered the basics of running and maintaining a computer. In this chapter I will cover the programs useful in research. Some will be well known, and others will probably be new to you. Take a look.

Before getting into this list of programs, which starts with general computer programs and productivity, and ends with a selection of programs very useful for research, there is one site worth mentioning.
http://alternativeto.net/

Whenever you want an alternative program, this is a good place to start looking. It is this site for instance that provided me with alternatives to commercial software for keeping track of references.

The only problem with it is that when a program is mentioned they do not provide a link – you have to make a note of the name and google it for yourself.

1. **Classic Menu for Word 2010, Excel 2010, Powerpoint 2010 and OneNote 2010**
   Microsoft love to innovate, and sometimes they do a good job. However, for each innovation it takes time to learn the new ways of doing things. I for one regret spending time learning to do things I can already do very well in older programs.

One major change from 2007 onwards is to replace the familiar menus with a ribbon. Fortunately, several programs exist which restore the menus – alongside the ribbon if you want to use it sometimes. One such 'addon' is **Classic Menu** for Office Home and Student 2010 (32-bit and 64-bit). The Classic Menu product line brings back your familiar menus and toolbars of Office 2003 to ribbon of Office 2010 and 2013. It makes Office 2010/2013 look like 2003, and allows you to work with Microsoft Office 2010/2013 as if it were Office 2003, XP(2002) and 2000.

The software is Only Free for Personal Non-Commercial (Home Computers) Use. If you are using Microsoft Office Home/Student, or using other suites of Microsoft Office in your home computers, the software is suit for you. Full features and functions, no fee, no limitation!

http://www.addintools.com/office2010/menutoolbar/index.html

2. **Commenting and editing a Word document – Hotkeys**
   Hotkeys are the short-cut keys that speed up work on a computer, especially if you can type quickly without looking at your fingers – touch typing. In fact, learn the shortcut keys (ie hotkeys) for Windows and Word and you will become more productive.

   There are whole lists of keys, and you can find them in many places on the web. There are two that are not well known, and are very useful for editing Word documents.

   a. **Adding a comment in a balloon**
      This is done by Ctrl-Alt-M each time you want to open a balloon.

   b. **Turning on correction**
      If you press Ctrl-Alt-R then from that time on in that document, any corrections will appear in a different colour.

      Now, this is just the introduction to editing, and it gets far more complicated than that, and an editor can accept, reject and modify comments etc. But these two commands will be useful. You can for instance write a note to your supervisor in a balloon. Everyone who comments on your document on a different computer will automatically do so in a different colour.

3. **Coping with compressed file: .zip .rar etc**
   Sometimes files on the web are compressed – they take up less space. Often several files are zipped together into one file. This is especially convenient when you are downloading from the internet since the files all arrive together in one file. The inconvenience is that zip files have to be unzipped before you can use them. There are many programs that will do this. Note, sometimes files are zipped as a self-unzipping file, ie they unzip when double-clicked. These have the suffix .exe which normally means program file. Be careful! Make sure you unzip in the place you want all the files to be in. Usually, make a separate folder, and move the file there before you try anything.

   In addition, if you zip a file and send it as an email attachment, it is less likely to be rejected by the spam filters of your friend.

   There are many free programs. The best known is Winzip. But **7-zip** is still free and is more powerful.www.7-zip.org/
   This program can be run separately, or from Windows Explorer as a right click option. It can unzip .zip files, but also many other file types such as .gz . For rar files then Winrar works well, even beyond the trial period.

4. **Clipboard extenders and screenshot tools**
   A clipboard extender saves everything you send to the clipboard. A good one allows you to organise your clips into folders, and to save images – either the whole screen or part of it.

   So what is a clipboard? Every time you mark some text, and copy it, the text is kept in memory. You cannot see it! But you can ‘paste’ the text into a document. The trouble is that there is room for only one ‘clip’. Next time you save some more text, it replaces the previous selection.

A screenshot tool takes a photo of the whole screen, or part of the screen.

I do not have a recommendation for a free program. I use Clipmate, which I can use to save, edit, and organise my clips. I can also make a small box round part of the screen and take a photograph of it ie I can make a small image file, which can then be manipulated, resized etc just like any other image.

Clipmate is so useful to me that it is one of the first programs I install on any new computer. For instance, whenever something starts going wrong with installing a program I can save a series of images, so record what is happening.

There are many possible programs. Look out for one that is fully featured,

- An unlimited number of clips that you can organise into folders
- Backup your clips
- Merge several clips into one clip
- Can mark a region of the screen and create an image, known as a ‘screenshot’. That is how I have done it in this manual in order to show how the computer works.

As a starting point check out reviews on http://dottech.org/
See here for a good long list
http://www.nonags.com/nonags/clipb.html

Here is what Giovanni thought (6 Oct 2012).

- **aiClipboard** PORTABLE
  Can store forever everything you copy to your clipboard: files, folders, graphics, texts, URLs, emails addresses etc.
  http://www.aiclipboard.com/

- **ClipMon** PORTABLE
  Terrific program with a stunning set of features and a magnificient user interface for monitoring and managing all of your items stored in your PC's clipboard.
  http://www.pa-soft.com/clipmon.html

- **Shapeshifter**
  Very handy clipboard manager with an elegant design: it's one of the few cliboard managers out there supporting any kind of format (Text, HTML, videos, graphics etc…) and any language spoken on earth.

- **Archive Clipboard**
  Funny multiplatform light clipboard app designed to easily manage your clipboard content with a couple of mouse clicks. With this magic tool you can edit, merge and Drag&Drop all your clipboard content anywhere, making notepad and mspaint a memory of the past.

- **Clipboard Master**
  It stores texts, pictures and files copied to the clipboard with an impressive array of options.

- **Clipboardic**
  It shares the clipboard data between multiple computers on your local network.

- **101 Clips** (multi-clipboard + screen capture program)

5. Pdf readers and editors

There are several PDF reader option apart from Adobe's, including Foxit, PDF-Xchange Viewer, Nitro PDF and Sumatra PDF.

www.techsupportalert.com/best-free-non-adobe-pdf-reader.htm

http://maketecheasier.com/6-alternative-pdf-readers-for-windows/2011/05/13

http://www.makeuseof.com/tag/6-pdf-readers-windows/

Why are they so important?

a. The use of an alternative will avoid many of the viruses that spread inside pdf files.

b. Most of the alternatives also have other functions, such as pdf editing. And this is VERY useful. One of the biggest problems in academic research is that you accumulate documents in the form of pdf files. Later, when you come to write the list of references you have forgotten where you found the files, so you have to go through the time consuming process of googling each title. One easy solution is this.
   1. Download the file: it will open within your browser.
   2. Copy the link from your browser
   3. Paste it into the pdf document
   4. Save the document to disk. The pasted information will be saved with the document.

6. Convert documents to Pdf

Some programs come with a convertor to pdf built in. But not all programs do. There are several free ways of doing this. Most of them work by installing as another printer. So instead of using 'Save as' and saving a file in pdf format, you print the document, then you choose the 'printer' which is really a pdf convertor. Each free program that does this has its differences in detail. Some work better than others, so, if you do not find one that works for you then try another one!.

I like **Primopdf**. It installs as a printer as usual, but it also places an icon on the screen. Now, all you have to do is to go to your file manager (=*ordinateur* =my computer), find the file, and drag and drop it onto the primopdf icon. Then the computer will flash several times and you will end up with a pdf file of the same prefix in the same folder, and the pdf file will probably open in your pdf reader so that you can check that it has worked properly.

7. **File managers**

'My Computer' ('*ordinateur*') or Windows Explorer give a tree like view of folders and files, with a preview pane. In Windows 7, this works quite well. You can also have more than one My Computer open at the same time, and for instance drag and drop files from one folder to another, and in this way making a copy of them.

But, the Windows File Manager is quite primitive. Here are some free alternatives you might like to try out. Some of them have 'portable' versions, which means they do not put anything in the registry of Windows. Portable versions are great for when you want to try something out.

Note, in my experience, these programs do NOT conflict with each other, so you can have several of them, even load a few, and copy and paste files between them!

Here are some suggestions.

- **FileMind**
- **CubicExplorer**
- **Multi Commander**
- **Q-Dir.**
- **Free Commander XE**
- **xplorer2 lite** http://zabkat.com/x2lite.htm

What do I use? First, the basic Windows, My Computer, or Mon Ordinateur, is not bad. I especially like the preview pane, which previews docx and pdf files quite nicely. You can run more than one copy, so you can work on more than one directory and copy files between them. The next program I use is the dual pane, Free Commander XE. It has a very fast and customisable File Find, with the ability to search within files for a key word. Xplorer2lite is excellent for previewing pictures and videos, with the anti-virus advantage of previewing within an unusual program.

Here is what Giovanni said on 15 January 2013.
BEST & always updatable FREEWARE

- http://belintesa.com
- http://www.softwareok.com/?seite=Freeware/Q-Dir
- http://www.efsoftware.com/cw/e.htm
- http://www.wxcommander.com
- http://justmanager.ru
- http://lunarfrog.com/taggedfrog
- http://www.miner-mole.com
- http://www.mhvt.net/quicktime/eng/ddzonexwin.php
- http://www.filemind.net

8. Typing tutors

Every researcher should learn how to type without looking at their fingers. This is known as touch typing. The time spent in learning to touch type will repay itself in a lifetime of future time gained.

Now, you could pay, and go on a typing course. But there is no need. There are several ways of learning to type for yourself.

First, a word about keyboards. Most people in this country will be using the French keyboard, and it may be best to learn to use this keyboard, even for English. Since I type mainly in English I have learned one of the English keyboards. When I want French accents I use some ‘hotkeys’ where for instance I press the key on the right of M and then e to get é. These hotkeys are available if you install the American International Keyboard.

a. Look at a diagram of the keyboard

I know people who have taught themselves simply by finding and printing a diagram of the keyboard, then looking at the diagram rather than looking at their fingers. Of course, they forced themselves to use ALL their fingers and not just one finger of each hand!

If you want to, you can put the keyboard on the screen. it is possible to put a small version of the keyboard on the screen. The advantage of this is that it even changes according to your choice of keyboard. So if you do not know the Arabic keyboard, when you switch to Arabic it will appear and you can study it. Search for 'Clavier Visuel' in Windows, and you will find a small window that can appear on the screen and show you the keyboard you are using.

b. Use one of the free typing tutors

These are in three types:

1) Online such as

- http://www.keybr.com/
- http://10-fast-fingers.com/
- http://www.typingweb.com/

2) Games, such as:

- http://www.funtotype.com/typinggames/
- http://www.typingkaraoke.com/
- http://www.bbc.co.uk/schools/typing/

3) Download and install serious programs

- **Rapid Typing.** http://www.rapidtyping.com/

- **Amphetype** http://code.google.com/p/amphetype/
  This is portable, and for any keyboard. It provides you with statistics including viscosity i.e. it measures the "pauses' one takes in between words. More pauses means higher viscosity. A lower rate of viscosity translates into better typing performance. You can also choose your own material for practice.

- **Klavaro** http://klavaro.sourceforge.net/en/index.html
  Includes French and Arabic keyboards.

- **Tipp** http://klavaro.sourceforge.net/en/index.html The lesson texts react instantly to your typing mistakes by repeating mistyped letters more frequently. The system helps you eliminate typing mistakes and learn touch typing efficiently. A wide range of dictations ensures you'll never get bored. You will become acquainted with all the keys on the keyboard in 20 sequential practice lessons. Commonly used characters are practiced earlier and more frequently than those that appear less frequently. Note, it is not clear if the French keyboard is included.

9. **Research tool: Zotero 3.0**
   www.zotero.org. Zotero is a powerful, easy-to-use research tool that helps you gather, organize, and analyze sources and then share the results of your research. Zotero 3.0, released in January 2012, is in two versions. Firstly, as part of Firefox. Secondly there is **Zotero Standalone** which is a separate program.
   a. On many websites such as library catalogs, PubMed, Google Scholar, Google Books, Amazon.com, Wikipedia, and publisher's websites, Zotero shows an icon when a book, article, or other resource is being viewed. By clicking this icon, the full reference information can be saved to the Zotero library.

   b. Zotero can also save a copy of the webpage, or, in the case of academic articles, a copy of the full text PDF. Users can then add notes, tags, attachments, and their own metadata.

   c. Selections of the local reference library data can later be exported as formatted bibliographies. Zotero users can generate citations and bibliographies through word processor plugins, or directly in Zotero, using Citation Style Language styles. As an open-source software, Zotero allows users to create their own customized citation style.

   d. There are many tutorials on the web, including videos. Try searching for **Zotero 3** on youtube and see what you get.

http://www.galter.northwestern.edu/Guides-and-Tutorials/zotero

10. **Bibme Online bibliography maker** http://www.bibme.org/
    BibMe is a free automatic citation creator that supports MLA, APA, Chicago, and Turabian formatting. BibMe uses external databases to quickly fill citation information for you. BibMe will then format the citation information and compile a bibliography according to the guidelines of the style manuals. If you prefer, you can enter your citation information manually. BibMe also features a citation guide that provides students with the style manuals' guidelines for citing references.

11. **Textcite** http://textcite.sourceforge.net/
    TextCite is a program for organizing and commenting textual citations from texts (books, articles, or other published works) for use in producing scientific or academic publications. You can organize by publication, author, category, or outline. It works with bibliographic management programs like Citation, EndNote, RefWorks, and BibTeX, providing important text/citation management capabilities that these programs lack, while still allowing for rapid footnote and bibliography generation by means of your favorite bibliography manager. It also exports to PDF and Word (RTF).

12. **Docear** http://www.docear.org/
    Docear ("dog-ear") is an academic literature suite. It integrates everything you need to search, organize and create academic literature into a single application: digital library with support for pdf documents, reference manager, note taking and with mind maps taking a central role. What's more, Docear works seamlessly with many existing tools like Mendeley, Microsoft Word, and Foxit Reader. Docear is free and open source, based on Freeplane, funded by the German Federal Ministry of Technology and developed by scientists from around the world, among others from OvGU, and the University of California, Berkeley.

    The main advantage of Docear is the mind-mapping capabilities. The main disadvantage is that it requires Java.

13. Qiqqa Free http://www.qiqqa.com/

Another tool for organising and linking together and commenting on pdf files. The integrated Qiqqa web browser is honed for one specific task – research. You can easily search multiple academic search engines at once to discover new papers. If you locate a useful PDF, then you can import it into your library (with original download location already set in the metadata) in one click. There is the ability to export the contents of your Qiqqa library/database. Qiqqa is designed to avoid lock-in. You can export your entire library to a combined BibTeX file for import elsewhere. All your PDFs are included with smart links in an html page, so you can easily access them by tag, author, and title, even without Qiqqa. You can also backup a snapshot of all your Qiqqa work at any time to a portable .ZIP archive file – could be useful, for example, if you want to establish a recoverable backup breakpoint prior to making big changes in the database content.

See for a comparison with other programs: www.qiqqa.com/About/Compare

For a good review see: www.makeuseof.com/tag/qiqqa-organizes-academic-papers-students-friend-windows

Most of large projects require collecting and reading a large number of papers or "knowledge items" - sometimes thousands of documents. The sheer volume of these documents can sometimes make it difficult to work with them, sift through them, and keep things under control.

Qiqqa was designed with this task in mind, and it has these main features to help you keep those documents under control and to keep your knowledge expanding coherently:

1. Comprehensive PDF document management.
2. The ability to import documents to the Qiqqa library/database.
3. OCR of imaged documents, with capture of text contained in any imaged PDF documents.
4. Automatic collection/creation of metadata for the documents.

5. "Super Tag" functionality to categorise and cross-reference your document content.
6. Sophisticated Find/Search functionality.
7. Ability to export the contents of your Qiqqa library/database.
8. Knowledge analysis/discovery.
9. Research web browser.
10. Brainstorming (Mindmaps).
11. Knowledge-linking.

14. Jabref http://jabref.sourceforge.net/

Open Source (ie always free) bibliography reference manager. Needs Java therefore is unsafe.

15. Mendeley http://www.mendeley.com/

Mendeley is a free reference manager and academic social network that can help you organize your research, collaborate with others online, and discover the latest research. It has several functions. Firstly, it can index your folders of documents, and allow rapid searching and finding. Secondly, it tries to extract bibliographic data from the files, and prompts you to fill in the extra missing information whenever you have time. Third, you can backup the files for free. You can also link up with colleagues with similar interests.

Note, you do not have to accept the online part. Also, I advise you **not** to use the free pdf viewer and editor to make comments. Mendeley stores the annotations you make in PDFs in a proprietary format. You can choose to open files in your favourite reader/editor to avoid this problem.

My opinion

Of all the programs here, Zotero, Mendeley Qiqqa, Textcite and Bibme online are probably the most interesting. For an easy bibliography maker, use Textcite. For indexing and searching pdf files use Mendeley. For a comprehensive solution, use Zotero, which is an extremely varied program all under one umbrella.

D. Web Whackers

Introduction

Sometimes in research you want to download a whole website. For this there are special programs. If this is just for data, then all is well. But sometimes you will want to analyse the files, and for this you will need to convert the files to txt format. In addition, thousands of small files from a collection downloaded websites is extremely difficult and slow to back up. Therefore, the easiest method is to turn the website into one image file known as an iso image, then 'mount' the image and read the contents in the usual way as if you were reading the files on a DVD. This section explains.

1. **Website downloaders**

   In the modern world, a corpus is often collected by downloading all or part of a website. This is tedious to do by hand. Therefore there is a huge range of programs, some free, some with a high purchase price, to download a website in whole or in part.

   eg http://www.spadixbd.com/backstreet/ where you will find backstreet downloader**.**

   Take your pick - there are many available. Google **free website downloader** and see what you can find.

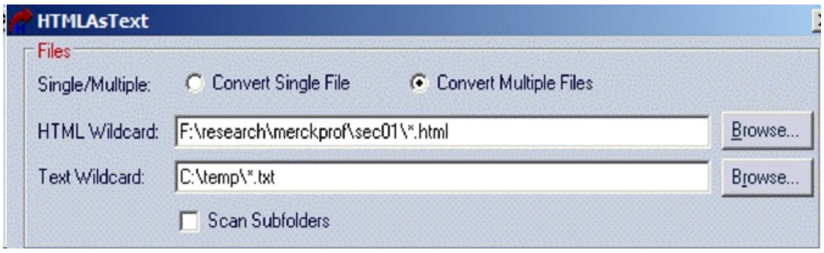
   Note, if you want to do some kind of text analysis, then pdf files can rarely be converted into a usable format, so data collection is usually restricted to data in html format.

2. **html convertors**

   The next task is to convert the files you want to analyse into txt format. Most text analysing software will only accept text.

   Of course, in the browser, you can always save a document as txt. My experience is that the browsers do not always do a good job. The other way is to copy the page to the clipboard. You can often avoid the pictures, the sidebars and adverts and other superfluous information. In which case you will need a free clipboard extender, see below.

Therefore there is a need for convertors which will take a group (or batch) of files and convert them. Unfortunately, good ones which are free are hard to find.



If you look at the screenshot above, when I wanted to convert multiple files I needed to specify the folder, (in this case F:\research\merckprof\sec01\ ) and then specify all the html files by using what is known as a wildcard. The star symbol [*] is used to indicate any name.

Sometimes you come across htm files instead of html, in which case you can write [*.htm] or even simpler still, write [*.ht*] which will cover all possibilities!

Similarly, I advise you to put in the output as [*.txt] as above.

3. **Making an iso image**
   Having saved your whole website on disk, the next step will be to turn it into an iso image then you can copy it easily. There are several free programs for this. One of the easiest is Imgburn. Install it, and choose the option **Create Image file from files/folders.**

4. **Reading an iso file**
   These two programs essentially do the same thing, but slightly different. **Virtual Clone Drive** differs from **WinCDEmu** in that it offers a System Tray icon, through which you can

mount and unmount images.

Virtual Clone Drive also lets you pre-mount virtual drives without content to reserve drive letters. What Virtual Clone Drive does not support is creating ISO images.
www.makeuseof.com/tag/extend-the-life-of-your-optical-discs-with-iso-backups-virtual-clone-drive/

www.makeuseof.com/tag/mount-your-image-files-on-a-virtual-drive-with-wincdemu/

Once you have downloaded, and made your iso file and proved you can mount it and therefore access it, you can then delete the downloaded files.

The other easier alternative is to use 7zip to make ONE file from all the thousands of small files. I have successfully done this for websites of over 50,000 files. It is a huge advantage for backup to be copying a small number of large files, rather than over 100.000 small files.

E. Programs for analysing data and miscellaneous

See http://tiny.cc/corpora This is a megasite of links, not just for corpus linguistics, but anything to do with programs for work in linguistics.

1. Lists of words, organised by frequency, have existed for years. The common division follows Paul Nation, and groups words by 1000 families. See http://www.er.uqam.ca/nobel/r21270/freq_lists/ and http://www.lextutor.ca/ for an online site for analysing language.

2. **Major tools from:** http://www.antlab.sci.waseda.ac.jp/software.html including **AntConc** (concordancer), **AntWordProfiler** for word frequency analysis etc, and **AntMover** for studying the moves in a text.

   For studying vocabulary, see the original programs, in DOS at http://www.victoria.ac.nz/lals/resources/range.aspx . I find there are advantages and disadvantages with both versions. For most purposes, the Windows programs are fine, and very reliable.

   Note, the user will often have to experiment with the programs - documentation is often thin, and the meaning of the various features only becomes obvious once you have tried them out!

3. **Ghawwas** (previously known as Khawas) is an open source system for Arabic etc corpora processing. Ghawwas V4.0 provides the following main functions:

   a. Frequency list for single word and N-Grams
   b. Concordance
   c. Collocation (MI, CHI Squared, LL, T-Score, Z Score, Dice, Log Dice, Weirdness Coefficient)
   d. Lexical patterns search
   e. Two corpora frequency profile comparison based on MI, CHI, LL, T-Score, Z Score, Dice, Log Dice, Weirdness Coefficient

f. Accept Windows and UTF-8 character encoding
g. Accept TXT, DOC, DOCX, RTF and HTML formats
h. Export the processing results in CSV file format
https://sourceforge.net/projects/ghawwasv4/

It does even more than this and apparently works well. The major drawback is that it uses Java. This means you must have Java installed on your system for it to work. And readers of this book will know that Java is an extremely dangerous product to have on your computer. There is no easy solution.

3. **Express Scribe - dictaphone software**
   http://www.nch.com.au/scribe/index.html

   Sometimes in research you have a recording and you wish to type what is there. This is called transcribing. Express Scribe makes this easier. It establishes hot keys like the play stop forwards and reverse on a cassette recorder. With it you can play a sentence, type what you hear, play the next sentence, and so on.

4. **Audacity**
   This is an excellent free sound recorder and editor

5. **Video editing and converting**
   There are several interesting free suites. Try:
   - Handbrake
   - DVDvideoSoft Free Studio

6. **Reading pdfs on a smartphone or tablet**
   Take a look at the following:
   - Calabri, for converting between different formats
   - http://www.willus.com/k2pdfopt/ provides a simple program that does not need installing. It takes a pdf file and reflows the text in such a way you can read it on a small screen.

Lowe I 2016a. A first textbook of research methodology and thesis writeup for second language English speakers. www.scientificlanguage.com Version 1.1

CHAPTER 20
EVALUATION OF SOURCES

Introduction
All researchers at some point will have to evaluate documents. Some research will be based only on documents. This chapter presents only the basics – the main points that all researchers need to know.

Nowadays, there is a high demand for the skill of evaluating internet sources. But, the principles are similar to evaluating documents which is in turn much easier. So evaluating documents is the starting point for the chapter, which leads into evaluating the internet.

For more details see Burns (2000) Chapter 27 and Bell (1999) Chapter 7.

A. Documentary sources

1. Historical research

Historical research is the systematic and objective location, evaluation and synthesis of evidence in order to establish facts and draw conclusions about past events. (Cohen & Manion 1985:48). It has value in that it enables solutions to contemporary problems to be sought starting from a knowledge of the past, it throws light upon present and future trends, and it allows reevaluation of data.

Evaluation of historical data is often referred to as **historical criticism**, and the reliable data that results is called **historical evidence**. First, the **authenticity**, (external criticism) of the source is appraised. Secondly, the **accuracy** or worth (internal criticism) is evaluated**.**

2. Questions that can be asked include:

Was he a trained observer of the event? How competent was he? What was his relationship to the event? To what extent was he under pressure, (eg from fear or vanity) to distort or omit facts? What was the intent of the writer of the document? To what extent was he an expert at recording the particular event? Were the habits of the author such that they might interfere with the accuracy of the recording? Was he too antagonistic or too sympathetic to give a true picture? How long after the event did he record his testimony? Is he in agreement with other independent witnesses?

Note: this passage above uses language which is unacceptable in the modern academic world. For a proposed revision of this see Chapter 13 Avoiding sexist language.

3. Beware eisegesis

Eisegesis is the process of interpreting a text or portion of text in such a way that the process introduces one's own presuppositions, agendas, or biases into and onto the text. This is commonly referred to as reading into the text. The act is often used to 'prove' a pre-held point of concern to the reader and to provide them with confirmation bias in accordance with his or her pre-held agenda. Eisegesis is best understood when contrasted with exegesis. While exegesis is the process of drawing out the meaning from a text in accordance with the context and discoverable meaning of its author, eisegesis occurs when a reader imposes their own interpretation into and onto the text. As a result, exegesis tends to be objective when employed effectively while eisegesis is regarded as highly subjective.

It is extremely easy to read back into the past some expectation from the present day, and to be critical of the past. For instance, Chaucer and others were inconsistent in their spelling. It would therefore be unfair to read back into their work modern day standards of accuracy.

4. Primary and Secondary sources

It is the goal of research to use primary sources wherever possible. Primary sources have less of the element of commentary to them, and are usually more reliable and less influenced by opinion. Your evidence should be traceable back to the primary sources.

a. Primary sources

These are original sets of data produced by the people who collected them. This means that for instance a government census bureau would be regarded as a source of primary data, because one department, as a single entity, collects analyses and publishes the data. **Primary sources include data before it is interpreted**.

A primary source presents original research for the first time. Examples include:

- a journal article that presents new findings or new theories

- an eyewitness account, even if published in a popular source such as a newspaper
- dissertations
- A review on the internet or in a magazine of a new product such as a printer.

1) *Contemporary primary sources*: compiled at the time by the writer. eg court record, Hansard (transcript of speeches in the British Parliament], Census data, some newspaper reports, contracts, letters, tape recordings, films. 'I am writing it now'.

2) *Retrospective* primary sources: compiled after the event by the writer. eg personal diary, autobiography, various reports. 'I wrote it afterwards'.

b. Secondary sources

This basically means **sources that are second hand, sources that repeat other sources.** These are sets of data culled from other people's original data. The principle is that it should always be possible for the reader (by following the references) to get back from the secondary to the primary source.

A secondary source provides a re-telling or evaluation of previously presented material. Examples include:

- a review article in a journal
- an entry in an encyclopaedia
- a textbook (usually, though care is needed, some advanced texts are actually presentations of new research by the author who did the research).

1) *Contemporary secondary sources*: transcribed from the primary contemporary sources. eg a research report based on the fieldwork of an assistant, historical study using actual documents, statistical research based on census data, research using other people's correspondence. 'He wrote it on the spot'.

2) *Retrospective secondary sources*: eg research using diaries or autobiographies. 'He wrote it afterwards'.

c. The distinction is not clear cut

Unfortunately, the distinction is not clear cut. therefore it is easy to think the distinction is unhelpful. But this would be to fall into a fallacy. Just because it is sometimes difficult to decide does NOT mean that the distinction is invalid. The distinction is especially important when combined with the principle of using primary sources where possible, and in referencing, to guide the reader to the primary sources.

> **Two principles:**
> 1. **Use primary sources where possible**
> 2. **In referencing, guide the reader back to the primary sources.**

The literature review covers primary and secondary sources. The findings, the raw data in your results are a primary source.

5. **Types of sources** (Taken from Mann 1985 ch 4).

a. Official records

Distinguish between verbatim transcripts, and edited summaries eg minutes of meetings.

b. Newspapers

Some parts can be primary sources, such as eye witness reports of a football match. Often they are secondary sources. Either way, newspaper reports are to be treated with caution because of their lack of other features making them trustworthy.

c. Official statistics

1) Researchers must be absolutely sure they know what the statistics are about. What do the terms mean? Eg a 'crime' can be 'crimes known to the police' or 'people prosecuted' or 'persons found guilty'. They also need to be aware of any changes in the definitions of a term: was it widened, or narrowed? Also, some social history is needed. The number of divorces went up in UK after 1937. But this was associated with the introduction in

1937 of three new grounds for divorce. Then after WW2 legal aid became more readily available.

2) Take special care with indices and ratios. These are often 'corrected' for various reasons.

3) The heart of the problem of using statistics is in the method of compilation and the meaning of the terms used.

4) Look out for errors, and inconsistencies.

d. Diaries, memoirs and autobiographies

True personal diaries kept for personal reading are rare. Diaries of famous people published maybe years after the events took place are common. Diaries are written at the time of the event; memoirs are the recollections of a writer (who was not necessarily the central character of the events described); an autobiography is an attempt to give a systematic and chronological record of the author's life, with the author as the central figure.

A problem with a memoir is that they tend to be defences of the author's actions at the time.

Unless memoirs are based upon documentation of the time, they are likely to be greatly influenced by memory effects. People tend to remember what is significant to them, and to remember the good times and not the bad times. People tend to self-justify, to self-aggrandise ie to boast. People fill in the gaps, they start reasoning, and reconstructing. All this is well known for instance to judges interviewing witnesses – something that can happen a long time after the event.

Memory is very open to suggestion and manipulation, either by the writer, or by those influencing the writer. The easy example of this is childhood memories of abuse. This used to be, and perhaps still is, a popular area in counselling. It is extremely easy for someone to invent stories, while being fully convinced they were true. Because of this the standards for evaluating such evidence have had to be significantly stiffened. Anyone evaluating a diary could with profit learn from this parallel stream of research.

'Hindsight' is a great teacher, but a harsh taskmaster. Diaries etc are very useful as evidence, but need careful interpretation. The good researcher rides two parallel horses: the explicitly state their own reasoning while questioning and evaluating the source. The more explicit the reasoning, the easier it is for the reader to engage with the assessment. In other words, the 'reliability' improves, and with it, objectivity.

Diaries tend NOT to be of lower class people.

e. Biographies
Take care to identify why a biography was written. They may contain primary sources eg original letters previously unpublished.

f. Correspondence, private and public
These usually greatly condense events. They are also written with a particular recipient in mind.

g. Historical documents
This term refers particularly to events of the past about which the main source of information is documentary, the participants being dead.

h. Legal documents

i. Books
These usually present secondary sources, but sometimes present original research done by the author(s) in which case this part is primary. Some people publish original research as a book or monograph.

j. Articles
When these report original research done by the author(s) then the articles are primary sources. When they summarise existing work, they are secondary.

k. Internet sources
See later in this chapter for a full discussion of internet sources and their credibility.

l. Grey literature
This is material that is reasonably public, but has not been published. Examples would be: school timetables, minutes of a committee meeting, departmental memo sent to all the teachers, etc. You may need to get permission to use this material in your research. As a guide, you should ask the person or office who issued the document. If in doubt, check with your supervisor. If there is a substantial amount of this as source material, you may need a separate list in your bibliography. Otherwise, it is best referenced using a footnote or a brief comment within brackets.

6. Scholarly versus popular

a. Scholarly journals almost invariably use **Peer review**: articles are checked by experts, and critical reports are written on them, and the author usually has to make changes in the light of the feedback from the experts. Therefore articles published in a peer-reviewed journal have passed a very strict test. Scholarly sources usually include sources of information, the author's real name, and the author's credentials. Most scholarly journals are not dominated by advertising, and the editor is subject to an editorial board of experts.

The audience for scholarly journals can vary. There are some very good scholarly journals aimed at teachers for instance, rather than researchers and other experts. When written for teachers the language will usually be less technical, and the subjects presented will be of interest to teachers, not just researchers.

b. **Semi-popular** magazines include *Scientific American* and the *New Scientist.* When describing new research they usually get their facts right (though not always - see subsequent letters in the journal and on the web). *Scientific American* is well accepted as providing state of the art summaries of existing knowledge for Baccalaureate level or higher scientists. The *New Scientist* is much more readable but is still authoritative, and sometimes news breaks in this magazine before one sees it in the journals, so it is useful in keeping up to date with a science in general.

c. **Popular** magazines include general interest magazines such as *Newsweek* and the whole range of hobby magazines, such as computer and business. Articles in the general interest magazines have usually gone through some kind of editorial standards checking, but their goal is to sell magazines, and they often have an obvious preference for one particular set of political values. At best they are a statement of one viewpoint, and they can raise questions for further documentation, but they cannot be relied upon as being authoritative.

7. **Author and publisher**
Some publishers are known for their academic standards. Most books published by a *University Press* such as *Cambridge University Press* bear the marks of authority. In a similar way, an author is more credible if they have good academic credentials (university post, doctorate, previous publications in peer reviewed journals).

8. **Documentation**
A bibliography (along with footnotes) shows that the author has consulted other sources. A good author will indicate the primary sources where possible, just like in an article for a journal. The bibliography authenticates what is being said. Also, it is easy to check the bibliography to see what sources the author is relying on. Are these sources up to date? Are the authors opinions representative, up to date, and fairly represent

the field? If Widdowson says something, he has a much greater reputation than a writer of an MA thesis. Authors build a reputation. Writing from a professor at Oxford is more likely to be accepted for publication than someone just starting their career. This is partly their ability, partly their experience of the ways to get published, and partly the fact that those with a reputation are more likely to be trusted.

Of course, this issue of credibility does vary with the subject. In most fields, only the professional has credibility: it is extremely rare for an unpaid amateur, an outsider, to get published. There are still a few fields left where the amateur is accepted by the professionals and does make significant discoveries. These fields include botany and astronomy.

See also
www.lib.berkeley.edu/TeachingLib/Guides/Evaluation.html
Critical evaluation of resources.

9. Wikipedia
This source of information can be used! But it must not be used as a dependable reference, and it must be evaluated. Wikipedia is quite variable in how good it is, so the general assumption in academic writing is that **you cannot use it as a reference except to criticise and evaluate it.** What you can use it for is background reading on a topic when first starting to do research.

B. Web sources

1. The burden of proof on the thesis writer

If you are not good at evaluating non-web sources, then you will find web-sources particularly difficult. It is true that many print-sources are now also available on the web, and this is a great help in countries with limited library resources. But, all sources have to be evaluated. **The web is relatively un-regulated** - there are few editors for instance who check what is published. In theory, almost anyone can publish anything they like on the web. They can easily lie, or exaggerate, about their content and about who they are. Documents can easily be copied and falsified (so the original correct document might be there, but on another site), or copied with omissions and errors (intentional or accidental).

> **The burden of proof is on the reader to evaluate the web sources. This means evaluating the validity, authorship, timeliness, and integrity of what you find.**
> **Be extra critical of internet resources. You the writer must prove that the source is academically credible. You must prove that your sources are serious.**

2. Online versions of articles

Where an article is published in a peer reviewed journal and this is also made available online, then the online article has the same credibility as an original paper journal. Some 'internet only' journals carry out peer review to the same standard as traditional journals. Official publications from organisations or learned societies are also highly credible.

Care needs to be taken on university sites, because there can be a range of material, from official, reviewed material, through lecture notes, to sample essays by students and forums for discussion. The lesson here is that just because a site is an official one does not mean that all the content on it can be given a high degree of credibility.

3. **Is the page updated?**
   Sometimes the author explicitly states when the page was last updated and gives an email for feedback.

4. **Who sponsors the website?**
   Reputable organisations like those who publish academic journals, or university sites are usually to be trusted, but be careful, some of the information will be personal opinion, and has not been through rigorous checking and editing. A good example of a website to trust would be “The linguist”. Check it out for yourself and see why!

5. **Why was the page put on the web?**
   To inform? To give facts and data? To explain? Many university lecturers are putting their material on the web. Some do it out of sheer love of the spreading of knowledge. There is a well honoured tradition in the academic world that knowledge should be free and shared freely, and the internet is a great way to share material that is available in Europe and America, but not easily available elsewhere. As a bonus, a good website can be listed in the Curriculum Vitae of the author, and they may even become more widely known than by the usual “articles in journals” route.

   Many people are now paying for their own websites. This is comparatively cheap. But why are people paying to put information on the web? Is it out of mere altruism and generosity? This may exist, and altruism is NOT to be dismissed as a motive. There is still in some parts of the academic world the belief that knowledge should be free or low cost, and that information should be shared freely. Therefore lecturers make their material available, some with the explicit hope it will help those in countries with limited access to libraries. One strong incentive to a lecturer to have their own website is so that they have total control over the site. Getting material published takes an enormous amount of time, and is a high risk activity - rejection rates are high even for professionals. So remember this when judging the quality of personal websites - peer review is rare.

On some websites, there is provision for commentary and a reply by any reader. This to some extent allows peer review.

A major advantage of personal websites is that many different kinds of material can be presented. Lesson material is common. Short essays and provocative comments are possible, along with reviews, and the possibility to also stray off the main subject into other fields the person is interested in. In linguistics, audio files of the material often exist. Sometimes there are small videos.

6. **What are the author's credentials?**
   Are they academic? Are they an expert in the area they write on? Some experts also write on areas that are their interest, but not their expertise, so care is needed.

7. **Are sources documented with footnotes or links?**
   Are these links in themselves reputable ones? We evaluate web sites in a similar way to other printed material, and similar questions apply. Scholarly work needs careful documentation or other means of revealing the sources of information. Saying what you believe without documentation is no better than giving an opinion.

8. The CARS checklist

See www.lib.berkeley.edu/TeachingLib/Guides/Internet/Evaluate.html
A useful memorable framework for evaluating websites is the CARS checklist, outlined below.

Credibility believability

Author's credentials

Evidence of quality control peer review, checking, representing an organisation

Metainformation. This is information about information eg abstracts, tables of contents, also recommendations, reviews, ratings, commentaries.

Indicators of lack of credibility eg anonimity, lack of quality control, bad grammar and spelling, basic facts wrong**.** Exaggerates.

Accuracy

Timeliness Some information does not date. Other information is out of date in a matter of weeks or years.

Comprehensiveness. Has covered the main points/ theories/ people/ facts/ disputable areas, and not ignored something that is significant which may be contrary to the case they are making. When important facts, qualifications (hedges) consequences or alternatives are deliberately left out, the author may be misled or misleading. How have they handled the selectivity bias?

Audience and purpose. This is just like reviewing a book. A web page must be assessed by the audience and purpose, and the content and style and argument must match the audience and purpose. Ideally the bias of the author should be declared, and you should take it into account. Eg a review of a Renault Express car by someone who works for Renault will be biased in favour of Renault, though no doubt it will make some interesting points.

Indicators of lack of accuracy These include:

- no date on the document
- vague or sweeping generalisations
- old date on information known to change rapidly
- a one sided argument that does not reveal there are different views and does not engage with them.

Reasonableness

Fairness

Objectivity

Moderateness

Consistency ie the information does not contradict itself

World View for some people their agenda takes precedence over truth.

Support

Source, documentation, bibliography, links

Corroboration. This is an important point. Corroboration, or confirmability, is an important test of truth. Information must be used to test information. Sometimes three or more sources should be used, and these three should be different types of sources. For instance, three companies reporting on a product may not be as good as a company, an expert, and a purchaser. When buying a computer, there could be three complementary sources of information: the manufacturer's website, a review at www.epinions.com, and a reputable computer magazine site such as www.pcpro.co.uk.

External consistency. A reliable author is likely to be reliable in the future. Similarly, when the author writes well about something you know about, he is likely to be writing well in areas that are new to you. Similarly, if you find mistakes where the author discusses something you know about, the author is likely to err in areas you do not yet know much about. The author may be right, but skepticism is needed.

Indicators of a lack of support

The main indicator is the lack of supporting evidence.

9. Web page types most useful for research

a. **Informational pages**. These are commonly from independent authors, companies, government, universities, and charities.

b. **News and journalistic sources** In general, news sites are bad sources for academic work because the information posted is ephemeral - it is taken off the site once it is history and not recent news. Some organisations (eg the BBC) operate extensive archives. The site pages are constantly changing.

c. **Advocacy pages.** Groups and individuals advocate certain points of view and certain lines of action. By definition, the pages are slanted, but, often they are written by people who care enough about the issues to thoroughly investigate them. A good check is to see how critical they are of themselves, and the ideas they are promoting.

d. **Personal pages**. These are useful sources of information about an author, and often have other material by the author, perhaps work-in-progress, or material that is not yet published, or web versions of published material.

10. Web hoaxes and misinformation

This is not really a problem in linguistics, but it may be in other subjects. There are sites that deliberately seek to deceive. They usually attract you by moderate pages at the beginning, then lead you into extreme material later. There is misinformation on health matters, and certain areas of history**.** For a good article on this search on the internet for "Better read that again: web hoaxes and misinformation" by Paul S Piper, who is a librarian at Western Washington University.

Lowe I 2016a. A first textbook of research methodology and thesis writeup for second language English speakers. www.scientificlanguage.com Version 1.1

CHAPTER 21
SEARCHING THE WEB

Introduction

Nowadays, most of the information, in the form of articles from academic journals, comes from the web. Therefore, one of the first tasks for a new researcher is to become familiar with the journals relevant to their speciality, and then to the journals likely to have information relevant to their research topic.

The normal complaint from students though is that most journals require an access code, which is unavailable. In this chapter I will show you how to get round this problem, and in doing so to get better articles and more of them! Searching is an ever-changing art which improves with practice. I will also present you with some search strategies and tips. The best part is at the end: how to find and obtain articles without paying for them!

A. Getting started

1. Become familiar with the journals in your speciality

Familiarity with the journals takes time. It comes in various ways:

- Note the journals used in articles and books that you already have in their possession.
- Go to the journal sites, and generally become familiar with the journal, and download a few free articles (many journals have free sample articles).
- Every journal will have available, free of charge, their Table of Contents (TOC) and almost always an Abstract. Save these for future offline reference.
- When you get an interesting article, look carefully at the references used. Try to get some of them.
- When you get to a journal you like, browse and read the TOC (Table Of Contents) for the last 5-10 years. Often in this way you will find a related article.

Tip: Save your browsings
You will gain a lot of time if you save the TOC and Abstracts to a clearly labelled folder. This folder is then something you can use when the internet is not available – ie you have offline access.

2. Save and use the Abstracts

Often, the Abstract will have almost all the information you need. So, even if you do not have access to the full reference, you can still use this article as a reference, even though you have only read the Abstract. This is particularly applicable to providing references for the wider ideas used when putting your specific topic in context.

3. Use the subject directories

Subject directories are a collection of sites organized by a human. At the top of the directory is a general topic. From that general topic the deeper you go into the directory, the more specific the information you will find. Sometimes subject directories are called trees.

I suggest you time the search string: what is a subject directory? This will give you several useful pages of information, such as
http://www.lib.ied.edu.hk/is/tutorial/module3/internet_resources/4_1/4_1_content.htm

Subject directories are especially useful when you are just starting out in your research and you are not familiar with the main sites, journals, and ideas. They are also useful when you are asked to add another direction to your research.

The site below has a good table comparing four major directories.
www.lib.berkeley.edu/TeachingLib/Guides/Internet//SubjDirectories.html

4. Examples of subject directories

- **Academic Info** gateway to college and research level Internet resources. http://www.academicinfo.net/subject-guides. Thankfully, with the abandoning of so many good resources, this one still exists in June 2016.

- **INFOMINE** A large collection of scholarly Internet resources collectively maintained by several libraries, including those from the University of California. http://infomine.ucr.edu/

- **Research Guides** An extensive collection of subject pages from the University of Delaware Library. They point to article databases, websites, research strategies, and more. http://guides.lib.udel.edu/

- **Open Directory Project** A significant resource collection spanning more than one million categories compiled by thousands of volunteer editors. http://www.dmoz.org/. Fortunately, it is still going strong. Long may it survive and grow, this resource is invaluable.

- **HCCLibraries.** A growing and updated subject directory of helpful websites. http://libguides.hccfl.edu/subjectweb

5. **Other ways to find a directory in your subject**
   The simplest way is to search for them. For example:
   directory:linguistics
   directory:history
   directory:psycholinguistics

B. Search strategies

1. **Phrases** can usually be indicated by placing the words inside double quotations, eg "**critical realism**". Sometimes Capitalising the words will mean it is treated as a phrase, as in **Critical Realism**. The trouble is that Google in their wisdom which seems incredibly condescending and arrogant has chosen to ignore the conventions of phrase search. At the time of writing they have introduced it as a buried option and called it **Verbatim Search**. Since Google often changes the layout, if you cannot find this option, then google it and find instructions!

2. If you want an assessment of an idea or a person, try adding the words **review** or **critique**. Critique has the advantage of working well in French as well as in English. Eg, typing **Chomsky** will get you thousands of references. Typing **critique Chomsky** without double quotation marks, will get you hundreds of critiques.

3. If there are **synonyms, or variant spellings**, or foreign spellings, use the OR function eg (literature OR litterature), (women OR females).

4. If you are looking for **terms with many possible endings**, then truncate (cut) down to the stem and add the wild card, eg to look for children and child search for child*, to search for feminism, feminist, and feminine, search for femini*.

5. **Boolean logic**
   Many search engines use this. For instance if you were interested in David Crystal, and the subject of language death. Both are phrases so need putting in inverted commas.

   - "David Crystal" "Language death" will get you a combined search, depending on the search engine.
   - "David Crystal" AND "Language death", Find all the pages where Crystal is linked with language death.

- "David Crystal" OR "Language death", Find all the pages mentioning David Crystal. Find all the pages mentioning language death.
- "David Crystal" AND NOT "Language death" Find all the pages mentioning David Crystal except those where he also talks about language death. Sometimes the command EXCEPT is used.
- "David Crystal" NEAR "Language death". Find all the pages where these two terms are close to each other.

Many search engines make this easier for you using the **Advanced Search function**.

6. When there are a lot of results found in a search engine, the option of **search within the results** will open up a dialogue box that helps you to narrow your search.

7. Similarly, when you have found one page that is really good, you can use **find similar pages** which is explained later.

8. Sometimes you find a page and want to know which sites refer to that page. Simply copy the page reference and put it into google. You will get a list of sites which reference that page.

9. On big sites, you sometimes want to search that site for information. There are two ways to do this. Supposing I wanted to find the pages on globalnet referring to the new ADSL link. The following two possibilities will work.
   site: www.gnet.com ADSL
   www.gnet.com ADSL
10. Another useful trick. If you want the definition of a word such as linguistics, in google type **define: linguistics** and you will get various definitions.

11. To find academic material, add the word **pdf** to your search phrase, or, **filetype:pdf** and this will give you lists of material in pdf format. Why is this important? Because most academic material is in the format of pdf and restricting your search to pdf documents will more likely provide academic documents.

C. Other useful sites and search engines

1. Use a variety of search engines

Do not assume that Google will give the same results as Yahoo, so if you cannot find what you want on one search engine then try another.

2. Use a mega search engine

There are search engines which in turn search several big search engines such as Google and Yahoo, and combine the results. These are worth trying out. Webcrawler is one of them. http://www.webcrawler.com/

3. Try out Yippy

Yippy queries several top search engines, combines the results, and groups similar results together into subgroups. You see this in a list on the left. You really need to try this out to see what it is like. http://yippy.com/

4. Google Scholar

Provides a search of scholarly literature across many disciplines and sources, including theses, books, abstracts and articles. You may find yourself using Google Scholar without you realising it when searching for an article, but it can be consulted directly using this link: scholar.google.com/

This is a major resource, and all researchers should be familiar with it.

5. The Directory of Open Access Journals https://doaj.org/

The Directory of Open Access Journals (DOAJ) is website maintained by Lund University which lists open access journals. The project defines open access journals as scientific and scholarly journals that meet high quality standards by exercising peer review or editorial quality control and do not charge readers or their institutions for access.

As of June 2016, the database contains over 9000 journals. It would be worthwhile searching this directory for journals relevant to your thesis, and seeing what you can find. Since the journals are ‘Open Access’ there should be no problem obtaining most of the articles.

But, there is a problem. This depends enormously with the field of study, but in some fields the most important journals are NOT Open Access, therefore you will find that most of the journals are lower level journals, perhaps run by non-native speakers, with lower standards of language, peer review, and so on.

D. How to find and read articles without paying for them

Introduction
I often hear the complaint: what is the point in learning how to find articles on the web when 'most' of them are unobtainable without payment or without an access code?

Unfortunately, in this country, there are very few access codes available. However, there are ways round the problem as I will show you below. Also, there is an emotional attitude point that needs addressing. The cold objective reality of the situation is that, compared to before 2000AD, we now have access to a huge amount of scholarly information.

I am assuming now that you have an article you want to download.

1. **Search for this article, using part of the title, and maybe the author and 'pdf' at the end**
   Sometimes there is more than one source for the article, and if you cannot get it on one site, keep looking and see if it is copied on another.

2. **Try other search engines**
   If Google is your main search engine, and you cannot find it then try one of the others.

3. **Google the author**
   Sometimes an author will have their own site, and they have placed there copies of their publications. Sometimes they are not allowed to post them all, but a similar article is provided, or a 'pre-publication' version. Many times when I have googled an author I have discovered a gold mine of similar material and articles that I did not previously know about.

   You should routinely google authors since this often leads to other articles which are even better than the one you were first looking for.

4. **Google part of the title and accept the similar results**
When you google part of a title, google will routinely provide you with similar articles. These similar articles can often be more interesting than the article you originally wanted.

5. **Make use of 'cited by' and 'related articles'**
Cited by means the more recent publications that include a reference to the original article. **Related articles** means what it says: similar material, which can be older or newer.

For instance, I knew about a critique of the communicative approach to teaching languages by Swan. So I googled **swan communicative approach** and the second hit looked like this:

[PDF] A critical look at the **Communicative Approach**...
seas3.elte.hu/coursematerial/HalapiMagdolna/**Swan**1.pdf
File Format: PDF/Adobe Acrobat
by M Swan - 1985 - Cited by 201 - Related articles
Communicative Approach (1). Michael **Swan**. This (the first of two articles) examines some of the more theoretical ideas underlying the 'Communicative ...

As can be seen, for this rather old though still relevant article, there has been 201 citations listed by google going right up to recent dates.

6. **Make use of Abstracts**
Often, all you need to know is in the Abstract, and most Abstracts are free. Also, you can reference them in the usual way, as if you had read the whole article. In my opinion Abstracts are underused as a source of information in theses.

Conclusion
You need to be familiar with the search engines, search methods, and with the journals in your field. With a little effort it is usually possible to find either precisely what you are looking for, or something similar. Often searches reveal even more and better information than you hoped for when you started.

Lowe I 2016a. A first textbook of research methodology and thesis writeup for second language English speakers. www.scientificlanguage.com Version 1.1

CHAPTER 22
MODELS, THEORIES, FRAMEWORKS AND TRUTH

Introduction

This chapter explores the vexed topics of:

- frameworks and models
- objectivity and subjectivity
- realism and constructivism

All researchers should be aware of these topics, which often function as hidden cross-currents underneath the work they do.

Models are almost always **simplifications**. Some detail may not be needed for the purposes of the model eg details of every screw in the airplane model placed in the wind tunnel.

Models are an analogy, which simply suggests one or more correspondences between two things. A model suggests many correspondences, and will be systematically developed and pushed to the limit. A model therefore is a complex analogy. The word has a wide range of usage.

In general English, the word 'model' has become more popular in recent years, and has taken on a wide range of meanings. These examples are common:

- a model of car.
- a plastic model of a ship.
- a person as a model.
- In recent years, 'model' in the sense of 'good example' has become common, as in ‘a model school’ or the way that a teacher must be a good ‘role model’.

But in the scientific and academic world there are additional meanings.

Models are a representation of something else for a special purpose

1. **Types of model**
   a. Something that **represents the original**, to remind us what the original looked like, eg a model aeroplane. The model is not the original. The model is an artificial representation, but is not the actual object.

      Clearly, this meaning contradicts the popular usage as in 'role model'. A person as a role model is to be copied in some aspects of their behaviour, but this person is not artificial or abstract, this human model is real.

   b. **Discovery**. eg doing experiments using a scale model plane in a wind tunnel, to do experiments to predict future performance and behaviour.

   c. **Explanation**. Such models are usually called theoretical. eg when the sun and planets is proposed as a model for the structure of the atom. Note that the model does not have to look like what it represents. The model could be a set of equations!

   d. **Theory**. A model is like a theory in that it proposes relationships between concepts. But models often use analogies, to give a more graphic or visual representation of a particular phenomenon. Models help to focus on key issues. Sometimes model=theory in the way people talk. Both are explanatory devices or schemes. A model is a tool, a help to think about reality.

2. **Five functions of models**
   a. **Psychological**
   To give a visual representation, at a human scale eg of a building.

   b. **Logical**
   eg using a computer to mimic possible ways a brain might work. Predicting the weather would be another example.

   c. **Explanatory**
   eg the common school experiment where a working model is set up including a tank of water and a pump to send water down a pipe then back to the tank. The height of the tank gives pressure, comparable to voltage, and the size of the pipe is comparable to the current size.

   d. **Normative**
   When a model represents an ideal, eg model pupil (diligent, hard working).

   e. **Interpretive**
   eg the theory of evolution is used to interpret many areas of human behaviour.

3. **Status of models**
   There are at least three viewpoints:
   a. **literalism**
   Identifies the model with reality. The model is so close to reality it is the reality.

   b. **Instrumentalism**
   Models are useful fictions. They are successful if they work, if they predict and handle the data well.

   c. **Critical realism**
   This is close to a softer form of instrumentalism, since models are likely to work because they describe well the phenomena being studied. A model is a simplification of reality, and a close approximation to it. A model is a tool

to help people understand reality.

4. **Theoretical models in science**
   a. They are mental constructs devised to account for observed phenomena in the natural world.

   b. They originate in a combination of:
      1) analogy to the familiar
      2) creative imagination in the invention of the new

   c. Eg **billiard ball model of a gas**
      This is really two models. First, you imagine a billiard ball table, and how at the beginning, shooting one ball at the rest sends the pack flying in all directions, rebounding off the sides, hitting each other, and changing the directions of each other. Then you imaging a bingo machine of coloured ping-pong balls bouncing around in a stream of air. The balls randomly bounce about and hit each other and the sides of the container. This bingo-machine is a visualisation of how atomic particles as a gas bounce around. The so called billiard ball model (both models combined) helps us to make predictions and comparisons, and has several correspondences to the reality being modelled.

5. Features of models
   a. Models are often a convenient calculating device
   b. Models are often a temporary psychological aid – they help humans to visualise it
   c. Models have an important continuing role in suggesting:
      1) modifications in existing theories
      2) the discovery of new phenomena
   d. Models are taken seriously but not literally
   e. Models are:
      1) partial and provisional ways of imagining what is not observable
      2) symbolic representation of aspects of the world which are not directly accessible to us.
   e. Models are **NOT** literal pictures of reality

f. Models are NOT necessarily useful fictions

NB. This is an important tight rope to walk. Models are NOT fiction, but they are not necessarily either the full reality.

g. Models are selected for their likely fruitfulness in generating further insights.

6. Use of models

We choose to use models when we are confronted with phenomena which are:

a. Complex. A model helps us to simplify and to concentrate on the main points or features.
b. Inaccessible to our senses. For instance, a model helps us to visualise the atomic world which is too small to see.
c. Conceptually difficult.
d. Novel.

7. Limitations of analogies and models

'Tautology' is when something is said twice in the same sentence. It is a form of circular reasoning (A is B and B is A).

a. It is tautologous to say that no analogy or model is perfect. If an analogy were perfect it would become an identity, ie no longer be an analogy; it would be the phenomena being modelled.

b. Some features of a model will:

1) provide helpful comparisons
2) appear to be unhelpful
   This prompts further investigation. Maybe a better model can be developed. For instance, inconsistencies in the model proposed by Hertz and developed by Rutherford led to the development of Bohr's quantum theory.
3) be neither helpful nor unhelpful
   And this in fact is how most science works.

8. Pitfalls of models, ie dangers of using models

a. **Over-extension**

   Extensibility can easily lead to mistakes. eg comparing sound waves and light waves could lead to expecting light to need a substance to vibrate in, hence the 'aether'. This is not true. It is easy to overextend because it is easy to make invalid comparisons.

b. **The serious danger with models is that the theory will be identified with the reality**

   Thinking of scientific theories as models is always a kind of 'as if' thinking. It must be clearly and loudly stated that **models are NOT the real thing**. For instance, the satellites view of the electrons in an atom is very helpful at the beginning of the study of atoms. The danger is that people will think this picture is real, whereas the model is a grosse simplification for beginners. The reality is much more complicated.

9. Choosing between models or theories

Scientists try to identify the main competing theories. The theories absolutely must be phrased in operational (testable) terms. Then they seek out evidence. The evidence they seek can be:

a. Evidence which supports one or more theories

b. Evidence which contradicts one or more theories

NB c. Evidence which decides between competing theories. It is this last type of evidence which is most valued.

It often happens that evidence can be used to support more than one theory. Therefore such evidence is of little practical use. It is surprising how many people get this wrong, including respectable academics who really should know better. What frequently happens is that people give too much value to supporting evidence **instead of to the evidence which decides between competing theories.**

- **A theory is not necessarily true just because there is a lot of evidence supporting it.**
- **A theory is more likely to be true when the same evidence supports ONE theory AND contradicts ALL the other theories.**
- **Evidence which helps decide between competing theories is the most valued**

d. Recent example

For an example of this in 2014, a new theory was presented to account for changes in global temperature.

Science is about testable hypotheses. Over the next decade, **the changes in temperature will reveal which theory is more correct, the carbon dioxide model or the notch-delay solar model.**

Here's the criterion: A fall of at least 0.1°C (on a 1-year smoothed basis) in global average surface air temperature over the next decade.

If the criterion does not occur: Then the notch-delay solar model is falsified and it should be thrown away.

If the criterion does occur: Then carbon dioxide driven models are falsified, and they should be thrown away. (Note that the carbon dioxide theory predicts only warming over longer periods such as a decade, and we've already had a pause in warming for 15+ years.)
http://joannenova.com.au/2014/06/big-news-viii-new-solar-model-predicts-imminent-global-cooling

10. Relativism

Models are very useful tools for conceptualising reality, but the models are not themselves reality. Therefore the whole question can be raised as to whether or not an objective world actually exists, or are people only debating various theories held by people.

Many people say, ‘there are no absolute truths, all is relative’, therefore we ought to be tolerant of the views of others, and all beliefs and values are of equal worth.

If the foundation is true (there are no absolute truths), it is self contradicting, even the statement itself is relative. In effect, people are dogmatically saying that you cannot be dogmatic. This is a self contradictory statement. Therefore a relativist position cannot be held consistently. Eg can we be tolerant of someone who is intolerant?

This is the sort of mess that one gets into once one denies the concept of objective truth.

The best practice seems to be to:

a. Try to distinguish between right and wrong

b. Realise that one may be mistaken

c. Actively encourage what is right

d. Try to change what is wrong

e. Tolerate distinctions that are of little consequence

11. Conceptual relativism

a. In an attempt to escape the fatal weakness of simple relativism, it has been claimed that the problems arise **only if one accepts the laws of logic which in themselves thought to be culturally determined.** It is argued that the basic rules of logic are in themselves a product of culture and that the notions of Logic and Truth vary between different cultures. Because Logic and Truth are said to vary from culture to culture, therefore it is argued that the standards of one culture cannot be used to judge another.

b. Conceptual relativism also claims that the concepts are social constructs which determine the world, rather than the world determining our concepts.

   Concepts ARE formed through social negotiation, but that does not mean the world is the way it is BECAUSE of our socially negotiated concepts. Take for example the fictitious animal the Unicorn which had the body and head of a horse, hind legs of a deer, tail of a lion, and one long straight horn. The concept is well defined, but we do not believe such creatures exist. To establish their existence, what could we do? Negotiate it? Or by searching for one in a world which they either exist in or do not exist in? The existence of Unicorns is independent of (not related to) whether or not we have a concept of the Unicorn. They could exist, and no one has seen one or described one.

   Take another example, that of counting. We commonly count in units of 10. But in the language of computers, the unit (called a base) is binary, ie base 2. Some societies count to the base 12, as did Britain until 1973 for the use of its money, when we had 12 pennies in one shilling, and 20 shillings in one pound. The bases vary, but the fact of counting does not.

12. The Law of Non-Contradiction

This law is the foundation for all logical thinking. It is known by a couple different names: the law of contradiction, and the law of non-contradiction. No matter what you call it this law is absolutely inviolable. The law may be defined as follows: a statement (a proposition) cannot be true and not true at the same time and in the same respect. For example: It cannot be both raining and not raining at the same time and in the same respect. It could have been raining yesterday, but not today. Or, it could be raining in Denver but not in Colorado Springs.

When one denies the law of non-contradiction, then there can be no right and wrong. There can be no real opposition when it comes to truth claims. Truth and falsehood would not exist. Think of it, that would mean that nobody could ever be wrong; and nobody could ever be right.

In fact, if someone wants to deny the law of non-contradiction, that person runs immediately into the law. Let me explain. In order to actually communicate a denial of the law of non-contradiction one must presuppose (assume) the validity of the law; otherwise my rejection of their claims would not be contrary to their claims. Imagine the following "conversation":

A. Hey, I don't think the law of non-contradiction is really that important. In fact, I believe that we need not follow it at all.
B. Really? So you think we need to follow the law of non-contradiction. You really believe that it is that important?
A. Didn't you hear me? I said just the opposite from what you said I said.
B. Oooh. Do you have a problem when people contradict you?

If there is no law of non-contradiction, then there can be no contradiction. But if there is no contradiction, for me to affirm that there is such a thing as contradiction would not be a contradiction. When expressing a denial or affirmation of any claim, proposition, belief or idea, one must presuppose the law of non-contradiction. It is fundamental to any kind of distinctions: right and wrong, good and bad, true and false.

13. **Conceptual Relativism asserts that there is a variety of beliefs and values, therefore there are no absolute truths.** Truth is only what a given society labels as truth.

    The argument goes that since societies interpret the same data in different ways, the reasons for this are to be found in the social conditioning rather than the things themselves. The research agenda is then diverted from establishing the truth. Instead, the research agenda is to study of why different beliefs are held. There is no concern to distinguish between objectively true and false beliefs.

There is nothing wrong with studying why different beliefs are held, provided the study does not go on to deny the existence of truth. They are two different questions. A phenomena can exist, whether people believe it or not.

In other words, we must distinguish between **causes for belief** - social, psychological and **grounds for belief** - which requires evidence. Reality exists, and by experimentation, theorising, and testing, we seek to understand and accurately describe this reality. But sometimes people choose to believe something else, against the evidence, and this whole subject of why people believe what they do is a valid line of enquiry. But studying belief, and studying the reality, are two different areas of study.

Studying belief, and studying reality, are two completely different areas of study, and they must not be confused and they must not be mixed up.

14. Traditionally, TRUTH means Correspondence to the Facts. eg ‘Andrew is 7 years old’ is a statement which is either true or false. The statement can be confirmed as true (a fact) by various objective means, which anyone presented with the same data would agree on as establishing the fact. Similarly, the data could be used to deny that this statement is true.

‘I believe Andrew is 7 years old’ expresses opinion. ‘I know that Andrew is 7 years old’ implies they have valid ground, eg having seen his birth certificate.

We can believe something which is not true. We cannot know something which is not true. A Culture DOES play a significant part in standards of rationality. eg a geocentric system for the Greeks was perfectly rational. But we use the same logic rules as the Greeks. There is a common core. eg identity, negation, the law of non-contradiction (the sky is blue, cannot exist with its opposite, the sky is not blue). The man-eating tiger is alive versus is dead. These are all univeral concepts of logic.

To say culture influences what is thought of as truth can be a fair statement, if by this we mean that **sometimes** there is a cultural influence. We cannot go on to say that **all** statements, all truth, all the time is always influenced by culture and that objective truth does not exist. Neither can we say that most statements most of the time are relative and cultural.

15. Examples from my own research

a. Xerophyte, mesophyte, and hydrophyte.

In English these terms refer to plants which are adapted respectively to dry, temperate, or wet conditions. The equivalent terms used in French are *xérophile, mesophile*, and *hygrophile* (*hydrophile* has another meaning entirely, it means something that absorbs water, and the English 'hydrophily' refers to living in water, see Lowe 1992 p 9.6). But in French the terms *xérophile, mesophile*, and *hygrophile* refer to plants or animals, unlike the English which refers to plants only.

Does this mean that the world is different in English and French? All that has changed is the classification system, based on the definitions. French and English can both have the same definition if this is desired, but French would have to say something like *des plantes xerophile* to express the English sense.

b. Definition of a line

This is a by now classic case where the definitions are so totally different in French and English and the ways of thinking and terminology based on this definition are therefore different. For details see Lowe (1992 p9.15ff). Basically, a line in French is defined as coming from infinity and going to infinity. In English, a line is the shortest distance between two points. Now at advanced level, both definitions are known in both languages, but at school level different choices are made depending on the language. These different definitions lead to different language and different concepts. The French can talk about a *demi-droite* which in English, 'a half line' or 'half a straight line' is a nonsense, because when a line is divided in two there are two lines. In fact, the English 'line' would be called a *segment de droite* in French, or 'line segment' in English. In this case, 'line segment' does exist in English, but it has the sense of one part of a longer line.

Now all this could easily be interpreted in terms of knowledge being relative, as a good example of how different languages by their different definitions have not just a different understanding of reality, but are constructing a different reality. But this would be unfair to the evidence. When the definitions are unpacked and explained, we realise that we are talking about different things. A line coming from infinity and going to infinity can and does exist independently of the language used or the label. A line which is the shortest distance between two points can and does exist independently of the language used or the label. In addition, in both languages both definitions are possible. The reality does not change. **What does change is the preferred way of dividing up reality, of categorising, of defining.** And this can lead to different ways of describing and perceiving the reality, of different emphases.

16. The so called Sociology of Knowledge, ie the study of belief

a. Science is usually taken to be a study of the phenomena in the natural world

But, in the Sociology of Knowledge facts have more to do with the way society works. If knowledge is socially determined, rather than socially influenced, then the Sociology of Knowledge would reign as the super-science.

b. **Problem of reflexivity**
The Sociology of Knowledge cannot ITSELF make claims to the truth of their statements of how science works. They can only relate to beliefs, or whatever sociologists count as true about the practice of science. Therefore no finding of the Sociology of Knowledge can be relied upon as real knowledge.

c. **The answer** is for the Sociology of Knowledge to concentrate on determining what is objectively true about the social origins of science, and what is cultural.

d. **The belief in social determinism must itself be socially determined**

Sociology of Knowledge people do argue their point that they are right, and verifiable facts do not exist. But what makes them so sure if (as they themselves have to agree) their own beliefs must be socially determined?

17. **Discussion**
In my own research I documented that French at High School level are less likely than the English to use graphs and other visual means of solving problems in mathematics or physics at school level. The French consistently prefer to use the more abstract methods of algebra. But the French could do it differently if they chose to. Indeed, I have heard that the Tunisian mathematics curriculum (programme) is currently being revised to use more concrete examples, to root mathematics in everyday life, just as the English do.

To say that different cultures have different approaches to a subject like mathematics does not mean to say that there is no underlying common reality. In other words, we cannot say that because different cultures have different approaches, then knowledge is constructed and invented. As Greg (2000:389) says,

> The simple irrefragable [irrefutable?] fact, though -- a fact that postmodernists consistently ignore or deny -- is that **scientific theories are not metaphors,** ***they are explanations of phenomena that occur in the natural world ....Scientists test claims.*** They test them by making predictions about the world, which they try to confirm or disconfirm by experiment and observation.

Newton's theories and laws were sufficiently accurate, sufficiently real, to be used as a basis for getting twelve men safely to the moon and back. In terms of the wider universe they might well be seen as approximations. But we all know that approximations are every bit as real as highly accurate measurements. Approximations are merely lacking in the detail of precision. There is an element of opinion, and community consensus, in arriving at truth, especially at the frontiers of science when new discoveries are being made and interpreted. There is an element of approximation in the way humans conceptualise and describe. But that is a struggle for humans to understand reality which objectively exists.

For those who wish to study this subject further, I suggest you do an internet search using the following expressions **critique "social constructivism"** and **"critical realism"**.

18. Approximations

It is easy to confuse two completely different concepts. They are confused because similar language is sometimes used. It is content and subject knowledge that will enable you to distinguish them.

Concept 1: an approximate measurement

Concept 2: an expression of confidence and certainty

Scientists commonly measure to only three significant figures – needless precision is abhorred. Other times, they will use terms like 'about' before a number to express their suspicion of that number. **Reader beware.**

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CHAPTER 23
LEVELS OF EXPLANATION

Introduction

I once had a discussion with an older member of my family about the likely future world dangers. She was concerned by the so called rising tide of violence in Britain. I replied that I thought the biggest dangers for the world were environmental and medical. In particular, I rated the dangers of the coming flu pandemic to be potentially very high. I did so, as a graduate in Human Biology. In 1979 I had studied epidemiology in detail. I had studied the history of the various flu pandemics. Even in those days, the lecturer was saying that we were overdue for a flu pandemic, and overdue for one that was extremely dangerous.

My relative's reaction though was interesting. She did not rate this as very important. She said, if it was so dangerous and so important, when was it coming? The scientists had been talking about it, but it had never happened. Therefore she had no faith whatsoever in the scientists.

My relative wanted and expected certainty from the scientists. Scientists deal with probabilities, with the element of chance, with factors that they do not have control over, and factors they do not have enough information about. In fact, because scientists take the threat seriously, they are working hard to detect new cases and deal with them swiftly in order to stop the spread. Paradoxically, because scientists are right and act swiftly the threat may be reduced in size so that some will think the scientists were wrong.

Yet the possible consequences of not taking the threat seriously are horrendous. In the pandemic following the first World War over 50 million people died - more than died in battle in the war. Something on that scale is still possible.

Because uncertainty exists scientists have developed tools for dealing with these matters.

In an effort to cope with large amounts of information, scientists also use the method called **reductionism.** This means that they focus on one level of explanation, and see how much they can explain only using this one level. This method can be overdone, and leads to the logical error known as 'ontological reductionism' or, 'nothing buttery'. ['Man is 65kg of elements', is true, and is reductionist. 'Man is only/nothing but 65kg of elements' is false, and is an example of reductionism going too far].

All scientists, including linguists, work with levels of explanation. Surprisingly, there seems to be no commonly agreed framework for such levels. The Dutch philosopher Herman Dooyeweerd seems to have been the one who most worked on this, but his work is not well known, and though extensively worked out, is debatable in many areas.

I remember when I was a student of Human Biology, we roughly worked with the following levels.

Figure 23.1 Broad levels in Science

Mathematics
Physics
Chemistry
Biology:
biochemistry
anatomy
physiology
Psychology
Sociology

1. **Common linguistic levels**
   Introductory material on linguistics commonly includes an explanation of levels of linguistics. (If you are not sure of this see Crystal 1987 chapter 13) In linguistics a sentence can be studied at one or more of several levels.

Figure 23.2, common linguistic levels

Two levels
Form
Meaning

Many levels
Various layers in biology
Phonetics
Phonology
Morphology
Semantics
Pragmatics
Sentence structure
Discourse

The number of levels, and the differentiation between them, does not seem to be important or fixed. For instance, it is common to work at two levels: form and meaning, of which the above list is but an expansion. What is obvious is that there are levels, and these levels help us in the business of describing and explaining language. Often the same text can be studied simultaneously at more than one level. This should be a matter of stating the obvious. In fact, the existence of levels of explanation is usually assumed and left without remark or comment. Sometimes it gets confusing when working at more than one level.

In addition, each subject will tend to have its own methods, theories, and traditions.

2. Common reasoning levels

In reasoning, there are also commonly used levels. Once again, the existence of levels is widely accepted. But in this case the exact nature of which levels are admissible or which levels exist depends very much on your starting point, the actual topic, and on your World View.

Figure 23.3 common levels in reasoning

Physical or biological, historical
Human, morality, justice
Human, behavioural
Psychological
Statistical, coincidence, luck
God, fate
Satan
Other

NB. Mixing levels can lead to confusion.

3. Levels of evidence in medicine

The field of medicine has several sets of levels. Here I will include two of them.

Figure 23.4 Recommendation grades in medicine

I - *Strong recommendation*	The described effect is plausible, precisely quantified, and not vulnerable to bias
II - *Provisional recommendation*	The described effect is plausible but is not quantified precisely or may be vulnerable to bias
III - *Consensus opinion*	Concerns about the plausibility or vulnerability to bias severely limit the value of the effect being described or quantified

Figure 23.5 Evidence grades in medicine

A - *High*	There is robust evidence to recommend a pattern of care
B - *Intermediate*	On balance of evidence, a pattern of care is recommended with caution
C - *Low*	Evidence being inadequate, a pattern of care is recommended by consensus

The world of medicine gives great importance to consensus guidelines. Some doctors hotly dispute them, but, any doctor who goes against them is in legal danger. The so called consensus guidelines are often dominated by vested interest and the drug companies. Given this, and the tendency for medicine to overestimate its skill and importance, even given this, very little of modern medical practice has the highest, IA level. Much of it has IIC or IIIC.

The details of this can be disputable. What is useful here is that the medical profession has established clear levels of evidence, and levels of confidence in the clinical judgement based on a summary of the state of the objectively known evidence. This is a far cry from constructionism.

4. Example: the spread of disease

The spread of disease is a good example because all of the above levels of explanation have at some time been invoked by people to account for the spread of disease. Take the rise of AIDS for instance.

Physical. The origins can be sought in the biology of disease, and the historical reasons why the disease developed when it did.
Morality, behaviour. Others explain it in terms of morality, and patterns of human behaviour, since it is a well known fact that total faithfulness in marriage would have eliminated the chief cause of the spread of AIDS.
The **psychological** is a well known factor influencing whether people resist disease or are badly affected by it. Of course it is not the whole story - physical disease cannot be wished away by overconfidence, but it is a significant factor influencing the development of the disease, and it is a significant level of explanation.
Coincidence and chance also play a part for instance when a doctor cuts themselves and happens to touch infected blood, or when infected blood destined for blood transfusion hit some people but not others.
God. Still other people see the hand of God involved, in punishing immorality, and others invoke **Satan** in the way he pushes people to behave and think in an evil way.

I am NOT saying that ALL the explanations can be invoked every time. The above example is just convenient in that I can explain it at all the levels, by way of illustration.

There is also the temptation to attribute individual disaster to God's direct intervention. Any given explanation can be generally true (for the majority of people for instance), it may NOT be particularly or specially true in any given instance. This point will be elaborated on below.

Note, it is possible to have more than one correct explanation provided that each explanation is at a different level.

5. **Some people exclude from consideration one or more levels**
The theory of Darwinian evolution is a case in point. This theory has been attacked by believers in God and by non-believers. Some atheists have written clear books opposing the theory of evolution. Why then is it still widely held by scientists? Scientists should of all people be experienced skeptics.

There are in this case three broad types of explanation
a. Evolution
b. Creation/Intelligent design
c. No explanation - I do not know - suspended judgement.

Many scientists do not like to live with scenario c., No explanation. They do not like the idea of some kind of belief in God, so they continue to believe in Evolution, even though they know that the evidence supporting it is weak. It would be fairer if people would acknowledge openly that there are two conflicting theories, each of which has its evidence and arguments.

Atheists commonly deny *a priori* any explanation involving God or Satan. This means they start by making an assumption, and are not interested in contesting that assumption. Once assumed, atheists sometimes go on to commit the notorious fallacy known as the 'God of the gaps' fallacy. Atheists sometimes say that when people see no obvious physical explanation, people invoke God and say it must have been directly due to Him. In other words, instead of suspending judgement, or instead of seeking a human or physical explanation, people attribute it to God.

Some people who believe in God do explain various phenomena as directly due to God. Other believers in God may also fall into a similar trap known as the ‘devil of the gaps’ fallacy. In the devil of the gaps fallacy, evil that cannot be explained is attributed to Satan. Thus those who believe that both God and Satan exist, and who wish to avoid accusing God of doing evil, will sometimes explain things by blaming the devil. Note, I am NOT saying that everyone who believes in God believes in Satan (the devil), or that people always behave this way.

I do not understand why some scientists are so committed to evolutionary theory (which they know has weaknesses) and are so vitriolic in their refusal to consider the possibility of Intelligent Design. These people prefer a bad theory to considering a viable alternative. Surely a good scientist behaves politely and courteously, and considers fairly all possible explanations! Scientist who want to consider only all possible natural explanations (and arbitrarily excluding God from consideration) are trying to change the nature of science to only considering non-god explanations. This is a relatively new development. When Western science originally started in the sixteenth century, it began in a broadly christian framework. See for instance Harrison 1998 and Grant 1996.

In my own field, linguistics, one figure, Chomsky, has dominated. But Chomsky has also been the focus of intense debate for and against. Alternatives are actively evaluated. Good science considers evidence, and tries not to exclude prematurely from consideration ideas which are radically different.

6. **Some people use only one explanation**
   Sometimes authors explicitly acknowledge that they are working at only one level, for instance, the chemical reactions undergone when a new medicine is digested, but they do not deny the existence of other levels. This is in fact a technique, well known in science, of **reductionism**. For the purposes of detailed study of one level, reductionism is a useful tool. The danger comes when people become exclusive of other explanations, and say there is ONLY a chemical explanation – the psychological does not exist or, is not important. The danger is that people only acknowledge one of the levels.

7. **Some people seek an answer at the wrong level**
   Harpaz (2003) gives a good example from psycholinguistics of how many people seek an answer at the wrong level. The focus of much research on child language acquisition has been on how children acquire grammar. As an example He quotes Culicover (1977:5) as saying "The learner is presented with data from a language, and has to make a decision as to what is the grammar". Harpaz argues that the focus on grammar is the wrong focus, the wrong level of explanation. The key focal point for the child is the question of the effectiveness of communication. Grammar is secondary to this point, and would only be one of many levels. How children learn to communicate is the more important question.

8. **Some people hastily jump to one conclusion**
   It seems to be a human tendency to make hasty decisions, to quickly jump to a conclusion. Some people are worse at this than others. Certainly, in the academic world, hasty jumping to conclusions must be avoided, and a deliberate effort must be made to suspend judgement. **No explanation is better than the wrong explanation.**

   In fact, in the tradition of science there are some guidelines, commonly called rules, as to which explanations are the most likely.

9. Guidelines for accepting theories

Figure 23.6 summarises the basic reasoning that scientists follow.

Figure 23.6, basic guidelines for accepting theories

1. **A simple theory is more likely to be true.**
2. **An elegant theory is more likely to be true.**
3. **A theory attributing malicious intent to someone is less likely to be true. A theory that is charitable is more likely to be true.**
4. **No explanation, or the presentation of several possible explanations, is better than the wrong explanation.**
5. **There is often more than one possible explanation, and several explanations may simultaneously be true especially if each one is at a different level, or if the**

So for instance, in normal healthy people, when you have a headache, the most likely explanation is the simplest and most common one: you are dehydrated and need to drink some water. It is not at all likely that you have a brain tumour. But if symptoms persist or get more severe or other signs of illness are noticed, you need to seek advice from a doctor.

Similarly, a loud bang in the house is most likely to be due to a window or door banging, or furniture falling over - it is not likely in peaceful countries to indicate attack on the house, or that demons have been busy.

It is very easy to attribute an injustice to the ill-will of someone ie to blame someone for the injustice. Possibly there was an injustice but it is quite possible that it was simple misfortune (the papers genuinely were mislaid), or the official genuinely made a mistake, or there were other circumstances which were coincidental. All these other explanations had nothing directly to do with the person concerned, therefore there was not malicious intent.

Among the uneducated people, 'conspiracy theories' abound. It is all too easy to attribute events to the mysterious actions of super powers. It would be more accurate to calmly list this as one possibility (scenario), but to suspend judgement, and to look for alternative explanations.

10. The mis-use of the word "Law" in the social sciences

In the social sciences this word "Law" is sometimes used in a deceptive way unworthy of any serious academic.

a. Legitimate uses of "Law" as legal

In the legal world, Law is the strongest word, and much stronger than rule, regulation, policy, administrative decision, protocol etc.

b. Legitimate use of "Law" in the sciences

In the hard sciences, a Law refers to a well tested theory that has never or almost never been known to be wrong. A good example would be the Second Law of Thermodynamics (variously explained, for instance, all matter tends towards the chaotic state, overall in the universe entropy increases, never decreases). This Law is simply put, in a testable measurable format, has extremely wide applicability with few if any exceptions.

c. Popular uses of "Law"

Rules of thumb, proverb-like approximations, are commonly called a law. For instance, Murphy's Law: if it can go wrong it will go wrong.

d. Deceptive uses of "Law"

A strongly held opinion by someone who styles themself as an expert. In the hard sciences such as physics chemistry and biology, you would be hard put to find such a usage.

Lesser words are used, such as 'hypothesis' or 'rule' or 'guideline'.

11. Why do Social Sciences tolerate the mis-use of "Law"?

It is a strong opinion held by scientists such as Gross & Levitt 1998 (Higher Superstition, John Hopkins University Press) and Sokal & Bricmont 1998 (Fashionable nonsense: postmodern intellectuals' abuse of science) that some parts of the social sciences, including psychology, sociology, and business, are trying to copy and emulate the experimental hard sciences. Promoting a good idea as a "Law" gives it higher status in the eyes of the reader. These people seek the higher status for their work afforded by such language.

Very few theories and rules in the soft scientists have been refined and tested so that they have the same weight as a Law in science. People who think otherwise are, frankly, deceiving themselves, and therefore living in a state some psychologists call 'denial'.

I actually think many soft scientists are unaware of the deception – and the rest prefer to avoid the question, and get very upset when challenged. However, that merely begs the question as to why they are unaware, because it is so simple and obvious that the deception exists.

12. Example

John Maxwell dares to call his propositions on leadership as "irrefutable laws" (The 21 Irrefutable Laws of Leadership – John Maxwell).When you look at them you will find:

- his key terms are not defined, or, if defined elsewhere, are not as extendable as he thinks
- no account is taken that the reader may have a different understanding to the writer
- there is little concern for validity – ie Maxwell's ideas may well be true for a small subset, but cannot be assumed to be applicable to a wider group by the very nature of the loose definition and the wider complex social situation.
- The so called 'laws' are not worded in testable measurable

format
- The ‘laws’ are easily questioned and refutable.

Frankly, such language is irritating, and perhaps a legitimate stimulus to the professional and to the academic to expose this language as deceptive and fraudulent. **Deliberate labelling of IDEAS as LAWS is conscious dishonest deception. Reader beware!**

13. Therefore be extremely sceptical whenever you see ‘Laws’ instead of ‘propositions for discussion’

Any writer in the social sciences who labels their work with this word is telling me that he is using deception. I once challenged a businessman who presented some Laws. I knew his first degree was in physics. I asked him why he so uncritically accepted the material and taught ‘discussion points’ as hard facts and laws that were indisputable. To his credit he immediately agreed with my assessment, and, at least while I was present, took care to continue explaining with suitable ‘hedging’ that the ideas were not fixed.

He knew the propositions were provisional. I knew that. But by using strong labels language, and with his authority, most of the audience took his material as indisputable. I was not popular in the audience for being sceptical – a case once again where the ill-informed resent the informed!

A general audience does not have the training to see through the confidence. Why did he continue to use the material? Because it was a ‘useful fiction’. This is fine, as long as everyone knows it is fiction and not fact.

Any person who teaches fiction when the audience takes it as fact is deceiving the audience.

He also taught the ideas because they ‘worked’. Here we have another fallacy to avoid in the social sciences. Just because a model/system/framework appears to work, does NOT necessarily mean it is true! Many frameworks work, but for other reasons.

Common Fallacy: it works therefore it must be true.
This is a fallacy because there may be other factors making it 'work', and there may be a situation where many things work, but they are NOT necessarily true.

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CHAPTER 24
TRIANGULATION

Triangulation is the use of more than one method, approach, source of information, or theory. It is dealt with in many textbooks of research methodology, and is relevant to all subjects.

Many people do research, and 'triangulate' without realising they are doing so. These people for instance might ask three different groups of people about the need for English: the students, the teachers, and the administrators. In this way they are studying the question of 'need' from three different perspectives. Or another researcher might tackle the same question using classroom observation, questionnaires, and interviews. Again, this is a form of triangulation.

Triangulation seems to be misunderstood, and students use the word almost as magic word, a word which adds value to what they have done. There are several kinds of triangulation in research.

1. **Types of triangulation**
    a. **Between method triangulation** when different methods are used in relation to the same object of study. (After Burgess 1984 p145). **This is a very common type of triangulation.**

b. **Within method triangulation**, that is the same method used on different occasions.

2. **Data triangulation**
   a. **Time triangulation** where the researcher attempts to consider the influence of time using cross sectional (the sample is a cross section of the community) and longitudinal (where a group is studied over a long period of time) research designs,

   b. **Space triangulation** by which researchers engage in some form of comparative study between two similar or dissimilar groups.

   c. **Person triangulation** at the following levels of analysis
      1) the individual level
      2) the interactive level among groups
      3) the collective level
      4) the individual in society

   d. **Investigator triangulation**
      More than one person examines the same situation.

   e. **Theory triangulation**
      Alternative or competing theories are used to analyse one situation.

3. **When more than one method is to be used, three principles are useful:**
   a. Researchers should keep their options open at the start of the project, especially when ideas are not very clear.

   b. Flexibility should be maintained.

   c. "...uncontrolled methods should be used to determine how controlled methods can be used". (Burgess 1984:145). You move from the general to the specific.

4. Example. Scientific language

In my research, many types of triangulation were used.

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a. People were interviewed using the unstructured interview format. I interviewed several types of people: teachers, heads, inspectors.

b. Lessons were observed, and a description of two schools built up.

c. Eighteen clear types of scientific language were identified. To give just one example: one of these types was the names, the nomenclature, in organic chemistry. For organic chemistry the differences were first documented. (The work of documentation was not easy since rulebooks existed only in English and I had to derive my own rules for French and compare chemical names in English and French. I myself, who had studied biology, which included some chemistry at University, found it very difficult to get all the details right in French.) The difficulty of doing this was in itself strong evidence against the theory that scientific language was the same in English and in French.

   So that you can see some of the differences I am talking about, see Figure 24.1 below.

Figure 24.1, Examples of differences in writing organic chemistry names

English	French
Z but-2-ene	Z butène-2
E but-2-ene	E butène-2
2methylbutan-2-ol	méthyl-2 butanol-2
1,1-dichloro-4-methylpenta-2-yne	dichloro-1,1 méthyl-4 pentyne
4,5,5-trichloropenta-1,3-diene	trichloro-4,5,5 pentadiène-1,3
1,2-dibromo-3-methylbutane	dibromo-1,2 méthyle-3 butane
buta-1,3-diene	butadiène-1,3
3,6-dimethylocta-4-yne	diméthyl-3,6 octyne-4

d. I used the textbooks, and other reference books.

e. I was also interested in seeing if these differences made a difference to Baccalaureate students, either for recognition, or for production. Therefore students were asked to recognise formulae in L2 and L3. (The native language is L1, the language of instruction L2 and the third language L3) My test instrument was to ask students to draw the formulae. The students had had a lot of practice in this skill, and I rightly thought that the skill was so highly developed that the skill could be used as a way of measuring if students had recognised a formula correctly. The results are presented in figure 24.2

Figure 27.2 Failure with organic chemistry names
(The percentages represent the **mistakes**, not the successes)

	L2 Recognition mistakes	**L3 Recognition mistakes**	**Production mistakes in L3**
English school	5.3%	26.7%	92.4%
French school	6.4%	13.6%	n/a

It can be seen that a significant but small increase was found in the mistakes in L3, in both schools. What is surprising is that the French school pupils were superior to the English school pupils in L3, despite the probable exposure of students at the English school to both languages.

Question to the reader: How would you have dealt with any cases where there was no error in L3 but there was an error in L2? It would be unethical to ignore these results, or to eliminate them from the results. If this had happened it would have raised questions as to how valid my testing was. The unexpected results would have had to have been noted and commented upon.

f. Students were also asked to rewrite formulae, converting from L2 to L3. This proved particularly difficult. For reasons of time, this was only done at the English school. A total of 198 questions were answered by 33 pupils and only 15 formulae (7.6%) were re-written correctly in French.

g. Commentary

The examples above illustrate how **several methods** were used. First a difference was documented, then it was found to be a small problem for recognition, and finally it was shown to provide significant problems when transforming a formula from L2 to L3. This example will also be discussed further in the book, a Feel for Statistics where I discuss research design that works against a difference being found (Key 9).

In this case, a difference was first identified and documented in detail. Then the question of the significance was dealt with at the level of the real world. There are many differences, but do they make a difference to real people? And in this case, do the differences cause a problem for recognition, and for production?

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CHAPTER 25
VALIDITY AND RELIABILITY

1. Introduction

Every thesis should involve an accurate assessment of validity and reliability. Considerations of validity and reliability are involved in the early stages of planning the research, the methods, data collection, and also in presenting the results, discussion and conclusions. Therefore it is vital that this subject become so well known that it is instinctive to all researchers.

In this chapter I present the basics. Types of validity and reliability seem endless, but those presented here are sufficient.

Any student of literature who thinks this chapter is irrelevant to them, should think again. This chapter is highly relevant, and I have a special section at the end, citing Literature experts, to defend my case. **"The activity of interpretation can lay claim to intellectual respectability only if its results can lay claim to validity"** Hirsh 1966:164).

It is also relevant to them for teaching, and, indeed, for normal life. In particular, the distinction between validity and reliability is frequently needed, not least in the field of personal health, so that we can begin to understand and sensibly interact with doctors. Read on.

1. The difference between validity and reliability

In simple terms, reliability is how well you can trust your measuring tools so that they always give the same result when measuring the same object. Validity refers to how fairly you can generalise your findings to other groups or other situations.

Burns (2002:350ff) explains it by asking students to imagine a factory which produces 30cm plastic rulers (Burns, being American, uses the antique unit inches, here I have changed it to modern units). Now it is well known that it is easy to make a mistake in the mixture of the plastic, so that sometimes a batch of rulers is produced that is, in practice 30.3cm long. Now the question is this. Are the rulers reliable? Are they valid?

The rulers are quite reliable, because they produce consistent results. Drawing a line of 30cm will always mean drawing a line of 30.3cm. But the rulers are not a valid measuring tool, since though they consistently give the same result, they are not actually measuring the 30cm accurately.

A similar question arises with other measuring tools, that often need calibrating. A blood pressure meter will always give consistent results, so that a change of blood pressure would be reliably detected. An increase of 10mmHg would probably be measured accurately on most instruments, but the absolute value, be it 140mmHg or 145mmHg for instance, will vary with the instrument. The newer electronic blood pressure meters need calibrating against the more valid (consistently maintaining standards) mercury barometer machines. If an electronic machine were used to establish data that were to be internationally acceptable, it would need to be calibrated, checked, and adjusted regularly, so that the readings would be valid and comparable with other meters. Remember, mercury instruments are simpler, easier to calibrate, and are known to be valid and reliable, unlike most electronic meters.

In logic, a valid argument usually means an argument that is coherent and relevant. Here I am talking about validity in experiments and measurements.

Figure 25.1, Summary of validity and reliability (Derived from LeCompte & Goetz 1982 p32)

	RELIABILITY Replicability, especially in interpretation. Repeatability. Trustworthy. Consistent	**VALIDITY** Accuracy. Measures what you set out to measure. Calibrated.
INTERNAL Agree on findings	Degree to which other researchers would match generated constructs with the given data	Observations are authentic representations of reality
EXTERNAL Selectivity problem	Independent researchers **discover the same phenomenon** or generate the same constructs	**Degree of generalisation** possible and how comparable the results are across groups

2. **Internal reliability**
   This refers to the degree to which other researchers, given a set of previously generated constructs, would match them with the data in the same way as did the original researcher. It is concerned with the accuracy of scientific findings. Would other researchers match the data with the theory in the same way you have. This is a key concern for ethnographers and LeCompte and Goetz (1982) go into detail on how to enhance the probability that within a single study, several observers would agree on the findings, and would agree on how the theory fits with the data.

3. **External reliability**
   This addresses the issue of whether independent researchers would discover the same phenomena or generate the same constructs in the same or similar settings. LeCompte & Goetz (1982) say that external reliability is enhanced by being explicit about five major problems:
   a. **Researcher status position**
      "Research reports must clearly identify the researcher's role and status within the group investigated". (p38).

   b. **Informant choices**
      "External reliability requires both careful delineation of the types of people who served as informants and the decision process invoked in their choice". (p38).

   c. **Social situations and conditions**
      "Delineation of the physical, social and interpersonal contexts within which data are gathered enhances the replicability of ethnographic studies". (p39).

   d. **Analytic constructs and premises**
      Be explicit about the theories used. "Replication requires explicit identification of the assumptions and metatheories that underlie choice of terminology and methods of analysis". (p39). Recognised frameworks and classifications have the advantage of helping the research to be understood and making the results more comparable, but they may hinder, in that the categorisation may be made prematurely, and the data may be made to fit the headings thus misrepresenting the data.

NB **The biggest danger** pointed out by LeCompte & Goetz (1982) **is selectivity of informants.**

Informants tend to tell you only part of what you want to know. This selectivity can be minimised by seeking corroborating evidence – triangulating and checking so that you do not rely on just one informant, or you check using for instance written information.

e. Methods of data collection and analysis

"Ideally ethnographers strive to present their methods so clearly that other researchers can use the original report as an operating manual by which to replicate the study." (p40). The authors argue that shorthand designations for methods are inappropriate, since there is no commonly understood set of descriptors for the many methods that can be used in ethnography. They also give an admonition that replicability is impossible without precise identification and thorough description of the methods used to collect and especially analyse data. (p40).

4. Internal validity

This refers to the extent to which scientific observations and measurements are authentic representations of some reality. It concerns how closely the theories match the situation, is often a major strength of an ethnograph in that unlike surveys and other quantitative techniques, the ethnographer often lives in a situation over an extended period of time, which gives the opportunity for refinement, and continual re-evaluation of the research.

5. **The main threats to internal validity**
   See also Burns (2002:357-360 and Cohen & Manion 1984:194-195)

   a. **History** ie other events
      Sometimes in research we do a test, then after doing something, some time later, we retest. In theory the changes noticed are due to what you did. But, in this time something else might have happened and the change might be due to these other things, other variables, not due to what you planned. Time is a threat to internal validity.

   b. **Maturation**
      Subjects mature over time, and the result may be due to these maturation factors rather than your experiment.

NB c. **Regression towards the mean**
   There is a statistical fact of life that is worth knowing about even if you do not understand.
   - Over a series of tests, people often do not score consistently,
   - Results of frequent tests and measurements tend to average out near the group average.
   - Subjects scoring high on a pre-test are likely to score lower on a post-test.
   - Subjects scoring low on a pre-test are likely to score high on a post-test.

   That makes it difficult to explain gains and losses in the results. Statistical regression happens because of the unreliability of the measuring instruments, the many extra variables that can intervene and affect people, and the way that in many phenomena there are natural swings.

   d. **Testing effects**
      Whenever you give a test, you give the students practice in what you are testing, and you may sensitise them to the purposes of the test. Once sensitised the students will do better, just because they have been tested, not because they

have had for instance extra teaching. This is the old story in science that when you measure something you change it, and maybe change it irreversibly.

e. Instrumentation
The measuring instrument itself may be suspect. With human observers or judges error can result from changes in their skills and levels of concentration over the course of the experiment.

f. Selection bias
Bias may be introduced by the way groups are selected. In addition, selection bias may interact with other factors such as history and maturation. Selection bias makes valid comparisons and valid conclusions difficult.

g. Dropout
In long running experiments, some people may drop out, so the final group will be select, and therefore different in composition to the original group.

6. Example of research with questionable internal validity
In an investigation of three different methods of teaching grammatical structure, three teachers in three different schools are each trained in one of the methods and apply it to their classes. One teacher has three mixed ability classes, another has four mixed ability classes, and the third has two homogeneous groups of fast track learners. Each group is administered a test devised by their teacher. Group means for each group are computed and compared.

Critique. The results are uninterpretable. It is impossible to say whether the results are due to the method, the proficiency of the students, the skill of the teacher, or the ease of the test.

People in Tunisia at the end of each term happily ask for the average of different children and compare them, even though these averages come from different schools with different teachers and different tests. People still think the marks are comparable. The British government commits a similar mistake when they insist that schools publish their success rates, and then the government draws up league tables of schools, and attempts to argue that schools with higher examination results are actually better schools. The science press, scientists, and educators have repeatedly discussed and explained the errors. This government mistake has been widely repeated over many years and it is sad that intelligent officials and politicians continue to publicly make basic mistakes in statistics and even make policy decisions based on such known mistakes.

7. **External validity** addresses the degree to which such representations may be compared legitimately across groups. (Le Compte & Goetz 1982 p32). The validity of the research is a question as to how closely the propositions generated, refined and tested match the reality of a situation in everyday life. How easily can the findings can be generalised to other situations? **The common way of enhancing external validity is to establish how typical a phenomenon is**, ie the extent to which it is typical compared and contrasted with other known phenomena. This means for instance the clear identification, specification and evidence for distinct characteristics of what is being investigated. (p51).

   Where it is not possible to use techniques of random sampling and statistical analysis, the characteristics of the group studied must be spelled out clearly. The results can then be compared with others and hence have a wider applicability.

It is a basic early step in research to carefully describe your group or groups. You need to carefully list all the different factors and variables. This is where ethnographic work – knowing the local context and knowing the main players and how the institutions work is so important. Explicit and systematically stated knowledge is foundational to planning data collection and interpreting the findings.

In linguistics it can often be difficult to measure what you want to measure. A test of reading comprehension for instance may in fact only be a measure of general intelligence. A test of achievement may in fact be measuring general test-taking ability. It is very important to make sure you are measuring what you set out to measure.

8. The main threats to external validity

See Burns (2002:358-60), Cohen & Manion (1984:196)

Threats to external validity are likely to limit the degree to which generalisations can be made and the way your findings can be extended and applied to other circumstances.

a. Failure to describe the independent variables

Remember, independent variables are the ones you have no control over, you can only describe them and account for them. When doing human research you really must describe all the factors in the situation, so that when someone tries to replicate the work, these factors are either kept the same or at least taken into account.

b. Lack of representativeness of subjects

While your subjects may be representative of the local population, they may not be representative of another situation which you are trying to apply to. The TEFL/TESL distinction is one example where problems can exist. Learning English in Tunisia is totally different to immigrants learning English in London. Comparing Second Language contexts with Foreign Language contexts is possible, but great care is needed.

c. Hawthorne (Placebo) effect

The mere fact of taking part in an experiment may mean a change. In medicine, so powerful are the psychological effects, that when a new medicine is tested, it is usual for special ‘double-blind’ tests to be set up. Volunteers are randomly assigned to one of two groups: medicine, or placebo. Then the doctor issuing the medicine does not know which patient is getting which type of pill. If the doctor knows, then very subtly their interactions with the patient will vary and this can effect the results. Commonly, even when taking a placebo, patients improve. The question is does the value of the treatment exceed the value of the placebo?

9. **Example of research with questionable external validity** (The generalisability of the findings is doubtful.)

A study investigated the effect of length of visual exposure on the ability to memorise and recall nonsense words. Subjects were ten postgraduate students who were undertaking a master of arts program in psychology. There were five different lengths of exposure, so five groups of two volunteers each receive different lengths of exposure. A volunteer participated in the study by being exposed to 20 nonsense words individually. After each exposure, the volunteer had to reproduce the nonsense word.

Critique. Assuming that the performance scores generally increase with increased length of exposure, the question remains: **To which populations and conditions can the results be generalised?** Can they be generalised to primary and secondary students learning meaningful material? Can they be generalised to young adults working on meaningful tasks in a highly structured situation? The answer to both questions is no. The results may not even be generalisable to the graduate student population, since the participants were volunteers. (Nunan 1992:16).

10. Types of validity

This subject has received too much attention in research. There are many types of validity, and many ways and labels. Here are some of them.

a. Content validity

Consider an examination. An exam has content validity if it examines the content and the skills that have been taught, and fairly tests some or all of the course. The question then is do the questions fairly assess the whole course? Would a similar set of questions get similar results?

b. Predictive validity

On the basis of these results, can we make a statement about future performance? For instance, does success in the *sixième* or the *neuvième* reliably predict that these students will successfully go on to succeed in the Baccalaureate?

c. Concurrent validity

Will a low score in the CCG (reading Comprehension, Composition, and Grammar) paper also mean that someone will get a low score in the laboratory examinations? Will a high score in the written paper be followed by a high score in the orals on the same subject?

d. Construct validity

"A construct is a psychological quality, such as intelligence, proficiency, motivation, or aptitude, that we cannot directly observe but that we assume to exist in order to explain behaviour we can observe (such as speaking ability, or the ability to solve problems)." (Nunan 1992:15). Constructs need careful description in any research. Example: if a study investigates 'listening comprehension' and tests it using a written cloze test, then by default, the assumed understanding of 'listening comprehension' becomes 'the ability to complete a written cloze passage'. If we find such a definition unacceptable, then we are questioning the construct validity of the study.

It needs to be shown that a given test measures a certain construct.

13. Questions to ask about evidence are:

a. What are its sources?

b. Are those sources legitimate, or how much are they legitimate?

c. Are those sources reliable, or how reliable are they?

d. How selective is the data?

e. Is the evidence relevant?

f. Who has an opinion about your data or sources? Have you accounted for their viewpoint or argument?

g. What biases are there in your evidence?

14. The options you have when you write up your work are:

a. Ignore validity because it is not a problem

b. Declare the limitations of reliability

c. Use established validation procedures

d. Discuss the problems of reliability and validity, and assess your own work

e. Declare the assumptions on which your work rests

f. Include and criticise the rationale for your procedures

g. Evaluate the paradigm from which you are working (After Barnes 1992 p161-2).

15. Validity in Literature

a. Introduction

All academic enquiry involves the pursuit of objectivity. The study of fiction is no exception. Where there is no objectivity, there is fiction.

A key writer on this subject is ED Hirsh (1966, 1973. Validity in interpretation. Yale University Press). Googling this title will get you plenty of commentaries and summaries, which is just as well, because the book is not an easy read. I will begin by some summary appreciations from
http://www.goodreads.com/book/show/228282.Validity_in_Interpretation

Comment 1

By demonstrating the uniformity and universality of the principles of valid interpretation of verbal texts of any sort, this closely reasoned examination provides a theoretical foundation for a discipline that is fundamental to virtually all humanistic studies. It defines the grounds on which textual interpretation can claim to establish objective knowledge, defends that claim against such skeptical attitudes as historicism and psychologism, and shows that many confusions can be avoided if the distinctions between meaning and significance, interpretation and criticism are correctly understood. It provides perhaps the first genuinely comprehensive account of hermeneutic theory to appear in English and the first systematic presentation of the principles of valid interpretation in any language.

Comment 2

"Here is a book that brings logic to the most unruly of disciplines, literary interpretation. Viewing this subject within the tradition of hermeneutics, Mr. Hirsch is able to trace its origins and development with brilliant insight. The result is a lucidly systemic and authoritative account of the premises and procedures applicable to the interpretation of a literary text. Mr.

Hirsch has performed a monumental service thereby that of reinstating the credentials of objectivism and defining the limits of the aesthetics of truth. This study is a necessary took for anyone who wants to talk sense about literature."—Virginia Quarterly Review

Comment 3
"Professor Hirsch demonstrates convincingly that objectivity is attainable in humane studies, and that it is not identified with the subject but with the evidence. A valid interpretation is not necessarily a correct one, but one which is more probably than any other on the basis of existing evidence. He makes a subtle and important distinction between a text's 'meaning' (which does not change) and its 'significance' (which does), and brilliantly relates meaning to understanding (the necessary preliminary to interpretation) and interpretation to explanation…" In short, this is a work which future students of literary theory cannot afford to neglect."—Notes and Queries (less)

b. Notes from the summary
http://ntinterpretation.files.wordpress.com/2009/02/validity-in-interpretation-summary1.pdf

- All humanities studies are based on interpreting texts, and the validity of initial interpretations is crucial to the validity of larger arguments.

- Certainty is not the same thing as validity, and knowledge of ambiguity is not necessarily ambiguous knowledge.

- Lack of absolute certainty does not indicate the impossibility of some level of certainty. [I expand on this elsewhere in this book, where I explain that approximate truth is still true].

- Type expectations control interpretation to such an extent that one may well interpret a text wrongly if one assigns it to another genre from the one to which it best belongs. [By type expectations, he means the expectations from the genre].

- ...valid interpretation is always governed by valid inference about genre.

- "The activity of interpretation can lay claim to intellectual respectability only if its results can lay claim to validity" Hirsh 1966:164).

- Thus, we must distinguish between competing probability judgments based on the evidence supporting each, but accumulating favorable evidence can never prove the correctness of a given hypothesis. Instead, a more reliable method is constructing various tests, which will lead to the rejection of incorrect hypotheses. Unfortunately, with historical material, this type of test is infrequently feasible. In this case, we have to weigh probability judgments against themselves and determine which is the most probable amidst evidence that seems to support various, competing hypotheses. Ideally, this process of weighing probability judgments occurs after one has received all available evidence for all competing hypotheses.

  To weigh the competing hypotheses, one must be able to assign a relative weight to the evidence adduced in their favor. The standard for assessing this evidence must be objective because only an objective standard can lead to a publicly compelling hypothesis.

- The methodical activity of interpretation commences when we begin to test and criticize our guesses.

c. Implications

1) Validity and objectivity exist in Literature. They are to be energetically sought.
2) The use of non-objective theories should be rejected.

d. The case of Freud

The events recounted now below would be the stuff of comedy, except for the way it was serious. I had the honour recently to be President of the Jury to examine an MA thesis in Literature. The system is that there were three of us, the supervisor, the examiner, and the president, who examined the candidate publicly. The candidate had used one theory from psychoanalysis, to analyse a character in a novel by James Joyce. This character, though fictional, was meant to realistically portray a person who could have existed.

There were many problems with the work. Here I want to focus on the choice of theory so that the readers can learn and not make similar mistakes.

1) They chose an out of date theory. Freud is over 100 years old.
2) They chose the theory without justification
3) They did not even mention the critiques of the theory, let alone interact with them and assess them.
4) Contentious terminology was not discussed and distinctions made between different senses
5) They said, "the psychoanalytic viewpoint" when it is a fact that there are multiple viewpoints. The subject is not monolithic.
6) I quoted two completely different sources, sources with high authority and high competence, yet coming at the problem from completely different perspectives.
   a) John Lennox is professor of Mathematics at the University of Oxford. In his book about evolution called "God's undertaker" he groups together "Freudian psychology and astrology".

      Perhaps the statement needs explaining in order to understand the significance and the overtones. Astrology is universally recognised in the academic community to be quackery – fiction if you like. He is saying that Freud is similar to astrology, and also fiction.

   b) In the skeptics dictionary, at skepdic.com, there are some similarly scathing remarks.

      > In many ways, psychoanalytic therapy is based on a search for what probably does not exist

(repressed childhood memories), an assumption that is probably false (that childhood experiences cause the patient's problems) and a therapeutic theory that has nearly no probability of being correct (that bringing repressed memories to consciousness is essential to the cure). Of course, this is just the foundation of an elaborate set of scientific-sounding concepts which pretend to explain the deep mysteries of consciousness and behavior. But if the foundation is illusory, what possibly could be the future of this illusion?

7) The big problem with the ideas of Freud is that they are not measurable or testable. As such they are the stuff of imagination, and one fancy is as good as another.
8) I therefore found it strange that the candidate was using fiction to analyse the potentially real.
9) In search of a comparison that would make the seriousness of these errors real to my audience, I compared the use of Freudism to the use of the flat earth theory to examine and evaluate a google map. The point stirred emotions, but on further reflection I realised I was wrong.
    a) It is grossly unfair to compare the flat earth theory to Freudism. Those who use Freud are worse than ‘flat earthists’.
    b) Flat earth theory is more credible than Freud.
        i. Flat earth theory is fact a limited approximation
        ii. Flat earth theory is testable
        iii. Flat earth theory works very well for most people most of the time, and for most google maps would be a fair theory to use.
        iv. Flat earth theory is one of those theories which have not completely lost their validity or usefulness.

v. The part of flat earth theory that says the earth is totally flat is obviously wrong. But we are not talking about that part.

vi. The part of flat earth theory that says that for all practical purposes for most humans most of the time, as far as the horizon, the earth is flat, then this is a useful and valid approximation.

Therefore, I insulted flat earth theory when I compared it to Freud. I made an unfair comparison. I committed what is known as a 'category mistake'. Potatoes and oranges are not the same. I cannot say that a potato is a kind of orange. Freud is far worse than flat earthism.

10) The only way the candidate could have begun to overcome this problem would have been to heavily justify their use of Freud. Whenever a researcher uses out of date fictional nonsense with zero validity, they need exceptional justification. Unsurprisingly, the candidate seemed blissfully unaware of the problem.

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CHAPTER 26
CASE STUDIES

1. Introduction

See Burns (2000) Chapter 26.

This is a catch-all term ie anything that does not fit into experimental, survey, or historical methods. Often used as a synonym for ethnography, participant observation, fieldwork, etc, it is a portmanteau term.

A case study typically involves the detailed observation of an individual unit. be it a person, a community, or an event. Examples include:

- student
- family
- class (teaching)
- school
- community
- event

A case study can be:
- simple, eg Mr Brown the headmaster
- complex and abstract, eg decision making within a company

Most studies are qualitative, with a focus on a particular feature. They are accurate observation and description. They are observations with a purpose. They must involve collecting a lot of data to produce in-depth understanding. They are good for raising questions, for keeping holistic, for asking who/how/why/what questions. Bear in mind that a typical method of science is to be reductionist, to study in detail a few tiny details from one viewpoint or level. Case studies often cross levels, and cross subject disciplines, helping to re-unite disparate observations and approaches, and therefore provide new insight that a study of several tiny parts could not give. Case studies often maintain and study the overall picture.

The main methods are observation, interviewing, and document analysis.

2. Purposes of the case study

a. They are valuable **preliminaries** to major studies. They are good for identifying variables and the web of relationships etc, are a good source for hypotheses, and a reality check to help interpret results later. It is possible to include case study methodology as stage 1 of your research.

b. Some studies have the aim of **probing deeply**. Most are based on the assumption that the case is somehow 'typical'. You may wish to probe deeply after your main findings have been collected.

c. Case studies may be useful in their own right, as accurate studies of a unique case.

d. Case studies can provide a context for interpreting unusual data. For instance, a story is told of a young child who came home one day and started calling all women a goose.

Now if this had happened as part of a survey of first language acquisition, then the information would have been difficult to understand. The parents found out that the child had been playing next door, and had heard a husband affectionately in a teasing way refer to his wife as a goose.

e. Case studies may refute (overturn) a published generalisation

A simple example of this comes from the world of medicine. The example concerns the hereditary progressive disease called ‘Cystic Fibrosis'. Patients with this problem have a cluster of symptoms. One of them is that the lungs are easily damaged by organisms which exist widely in the environment. Normal healthy individuals tolerate these organisms, but never get infected by them. One of the organisms is Pseudomonas aeroginosa. When a cystic fibrosis patient gets infected with Pseudomonas aeroginosa it is standard policy to treat the infection vigorously, either at home or in hospital. It has always been assumed that those living with the patient, or in contact with the patient, are in no danger from Pseudomonas aeroginosa. Therefore it was a significant event when some doctors reported that the parents of a patient with cystic fibrosis required hospital treatment for infection with Pseudomonas aeroginosa, and it was shown that the strain involved was the epidemic (dangerous) strain, similar to the one in the patient.

The assumption was that parents, the care-givers, the ones living with someone having cystic fibrosis, are in no danger of contracting the disease form of Pseudomonas aeroginosa. **This generalisation was questioned and made more sophisticated by one clearly documented case history**. (McCallum et al 2002). But there is a difference between logical refutation and methodological refutation. We cannot take this case history as simple refutation because while one example may be enough for a refutation the example might in fact raise other questions of methodology. In fact, the authors of the medical study did go on to ask why the rule had seemingly been broken. They found, unsurprisingly, that the care-givers themselves had some other susceptibility to infection. The rule therefore is now somewhat qualified: normal care-givers without any other health predisposition are immune to the disease which afflicts the lungs of cystic fibrosis sufferers.

3. Types of case study

a. Historical

Tracing the development of an organisation over time.

b. Observational

Systematic observations of a well defined group, or a single person.

c. Oral history

Extensive interviewing of one person.

d. Situational analysis

Eg an act of cheating studied from different viewpoints. Student, teachers, head, parents, other pupils etc

e. Clinical case study

One person studied in depth. eg a child having problems with reading. You could use interviews, observation, documents, even testing.

4. Planning the case study

Like a funnel, start broad and then narrow down; move from the general to the specific. Start with a thorough exploring of the general context. Then focus on the circumstances of the situation, the main people involved etc. In conducting a case study, on a daily and weekly basis it seems there are decisions, small and large, to be made as to what to do next. Decisions should ideally be taken based on clearly set out principles and objectives. Often there is no right choice, so the researcher must make a reasoned choice and be ready to explain and defend it later.

What makes a case study so difficult is that not everything can be done, and there are consequences from your choices. Case studies usually require great poise, great interpersonal skills, and a willingness to take risks, make mistakes, and to press on. There is a balance between self criticism (self examination) and self confidence

Case studies are very time consuming, and generate a lot of data.

5. Sources of evidence

a. **Documents**

b. **Interviews**

c. **Participant and non-participant observation**
In participant observation you observe, and to varying degrees also take part. If you are a non-participant observor, you try to avoid involvement. I experienced both. In my research in the French school I was largely ignored by teacher and pupils during the lesson. In the English school at times I was explicitly asked to join in the class discussion and provide authoritative comment. Both methods have their advantages and disadvantages. Whichever method you use you will need to justify it and account for your biases.

6. Skills needed

a. Ask clear and precise questions.

b. Be a good listener.

c. Be adaptable and flexible. Things rarely work as planned.

d. Have a good grasp of the issues being studied. Be sensitive to where evidence clashes, or where there is a contradiction. **Whenever you see (or think you see) a contradiction,**

then you must investigate. Be very slow to criticise or judge or to take sides.

e. Be open about your own bias and interest. This means being honest about your prejudices and opinions and be willing to acknowledge them and state them.

f. **Know how to avoid the self-fulfilling prophecy**, the way people tend to respond and give in the they are expected to. The problem is that people often give answers they think you want to hear. People often want to please, therefore will often give polite non-offensive answers that hide the real truth. The main ways to avoid this are to build relationships over time which permit people to speak frankly, and to double check information.

g. Know how to cope with a large amount of data and be able to extract the relevant bits, and synthesise information from many sources and occasions.

h. Know how to extract and maintain a reasonable framework, related to the question. eg a timeline.

7. Some issues

a. Subjective bias

It is easy to be subjective in a choice of evidence, or choice of explanation. The skilled researcher uses various means to improve objectivity. They are also 'up front' and open about their own biases and discuss them in the thesis.

b. Generalisation

Case studies provide little evidence that is generalisable. How can you generalise from a single case? But, that is not usually the aim of a case study. Case studies often focus on unique circumstances. The case study worker has a good grasp of the complexities of the study, and the historical, social, personal etc contexts.

This needs to be repeated. In a case study you are of course aware of the issues of reliability and validity, and this will affect how you interpret your findings. But, no one expects a case study, in itself, to be instantly generalisable.

c. Time and information (data) overload

All case studies demand time and generate a **lot of data**, **thus increasing probability of bias and selectivity in what data is eventually selected and used**.

The solution lies in being focused. Eg I began in my own research by detailed classroom observation. In a way it was a kind of case study – of two unique schools. This case study became only the first part of a long series of methods which included documents, interviews and questionnaires. As a result of my observations and initial analysis I formulated my list of hypotheses, then concentrated mainly on collecting evidence related to these hypotheses. This meant for instance when observing lessons I **only** took notes when the material observed directly concerned one of the hypotheses.

d. Reliability

It is a well known fact in science that observers have to be trained to observe. The classic example of this is that right at the beginning of my time studying chemistry, in the first lesson after the lesson on safety, the teacher produced a candle, placed it in front of the class, and explained that a good scientist is first of all a good observer. We then had over half an hour to observe the candle and write down as many observations as we could. Most of us managed less than ten. Then the teacher read aloud a long list of over 50 observations. The point had been well made.

Later, as a science teacher, it was my task to make sure that everything was cleared up and in its place after a practical lesson. One of the skills a science teacher learns is how to persuade reluctant students to tidy up effectively, and how not to loose a single item of equipment. Many many times the class would clear up and declare they had finished. I would then ask the whole class to look round the lab and tell me what was not right. I would simply glance round a room and notice the misplaced items that the children could not see. Eventually some children would become as good at it as I was. The point is that children needed teaching and practice in observing.

Some people can get into a car, and just from the noises made, notice that something is wrong, and sometimes even be able to identify what is wrong. I recently took my car to the mechanic, complaining that the radiator was losing water. On opening up, the mechanic immediately saw one of the problems and pointed out the traces of water coming out of a pipe. He found more problems when he did some tests since he was a good enough mechanic to systematically look for several faults and not just be content with one fault.

Knowledgeable skillful people observe better. In case studies the testing instrument (tool) is the researcher. With practice and training the human becomes a more reliable observer. How good are you? How reliable are your observations?

e. **Enhancing reliability**

Reliability in case studies focuses not so much on replicability, as on the **dependability of the researcher,** that the results make sense and would be agreed as solid by others in that situation. Reliability is enhanced (improved) by multiple methods,

- reporting of biases
- reporting how decisions were made to collect what data. The work needs to be replicable (repeatable), therefore the steps and procedures need explicit statement and justification in the final report. This means you include in your thesis what you did and why.

The goal is that under the same circumstances a different person testing the same hypotheses would obtain the same results and draw the same conclusions. Or, if circumstances change somewhat as they often do, the detail given would enable someone else to fairly interpret your data and compare it with their own data.

f. Validity

To improve validity in case studies use various types of triangulation. In particular, actively seeking out information that would disprove ones own interpretations can be an effective way to improve validity. There are two types of validity in particular that can be improved:

1) *Internal Validity*. [how well the findings match reality]. Improve by constant cross-checking and long-term observation.
2) *External validity*. [generalisable beyond the immediate context]. How typical is the case? It is often better to be cautious and let the reader decide if that applies to them.

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CHAPTER 27 QUESTIONNAIRES

Many textbooks on methodology, such as Cohen Manion and Morrison (2011), also Burns (2000) have detailed guides to questionnaire construction with examples. This chapter should be read with Chapter 28 on interviews, since much of that material is also relevant to questionnaire design and Chapter 29 on how to analyse and present the data.

1. Preliminary considerations

a. **The purpose of the enquiry**
   Be very specific, and get down to detail. You must do the hard work of thinking through exactly what you want to achieve. Questionnaires are not the easiest tool to use, even though they are very popular.

b. **The population**
   In the planning stage, you need to identify and specify **the whole group that you want to study**, and from which you will probably choose just a small part.
   1) Be specific. eg 'all students taking the CAPES in English' is easy. But 'severely handicapped' or 'underachievers' or 'highly anxious' are vague terms.

   2) Will you get all the population, or only part?

b. **The smaller group is called the sample**
Notice how the competent researcher starts with the total population and works down to the sample. Only in this way can one start planning the sample to be representative.

For instance, you might start with a population of all the students in Tunisia taking the Baccalaureate in 2006. You choose 100 students from one school in a city. Your 100 students are a sample. It is a very complicated subject as to how representative your sample is of the whole population.

c. **Resources**. Questionnaires are time consuming.

2. Types of random sampling

a. **Simple random sampling**
Each member of the population has an equal chance of being selected. It needs a complete list of the population.

b. **Systematic sampling**
eg every 20th person in a population list

c. **Stratified sampling**
eg a random selection of males, and a random selection of females is taken.

d. **Stage sampling**
eg randomly choose your schools, then randomly choose the children you want to test.

3. Types of non-random sampling ie where randomness is not sought.

a. **Convenience**
This means take the nearest. Often this will be the classes a teacher has access to. Often the bigger problem is one of obtaining permission or obtaining cooperation, and convenience sampling is the only practical way to proceed.

NB. Convenience sampling is a form of non-random sampling. I have read far too many theses where students have got this wrong. Superficially it feels that convenience sampling is random, but it is not: there are elements of predictability and bias in convenience sampling which means it is NOT random. The actual confusion is a good example where the naive realist (ie uniformed) comes to one conclusion, and it is a conclusion that seems to be obviously correct, when the knowledgeable person – a critical realist – will come to a different conclusion.

b. **Quota sampling**
Representatives of each subgroup, in the proportions in which the subgroups exist. eg in race relations, a quota for each ethnic group in proportion to their size. This is how the common practice of opinion polls are organised.

For instance, in a survey of opinions about how hot it is in summer, you need to ask different ages, and distinguish between males and females. Usually you need at least 30 from each subgroup.

	M	F
15-29	30	30
30-64	30	30
65+	30	30

c. **Purposive sampling**
The researcher handpicks the cases on the basis of his judgement of their typicality. For instance, you may wish to compare the best students between several classes. The best students are not only those with the highest marks in a class, and the teacher, taking many factors into account, would handpick the best.

d. **Dimensional sampling**
Identify all the factors of interest, and seek out one individual as representative of each combination.

4. **Sample size**
The required size of the sample varies a lot. A researcher needs to think this through in advance, depending on the number of variables. The sample must be big enough for analysis of subgroups. Subgroups of less than 10-20 are too small to be fairly considered, so **each subgroup needs to be at least 10, and preferably over 30 in size**. To the extent that a sample does not match the larger population, there will be 'sampling error'. In short, it is important to identify subgroups and consider them, but each subgroup needs to be a reasonable size.

5. **Practical advice**
a. Keep instructions clear.

b. Work hard on a pleasant layout.

c. Ticking is easier than circling numbers.

d. Be consistent in the layout.

6. **Forms of survey**
a. **Face to face interviewing**
This is essential when:
1) the population is inexperienced in filling out forms, or is poorly motivated to respond
2) the information required is complicated or highly sensitive
3) the questionnaire is open-ended, requiring rewording of questions depending on the previous responses.

NB. Take care in the interview NOT to give your own ideas and NOT to impose your ideas and NOT to influence the reply.

b. **Self completion**
This is possible when people understand the questionnaire, and are willing to fill it in.

c. **Postal self completion**
The key problem is to achieve a good response rate. But sometimes there are no alternatives. Bear in mind that a

low rate of return means the sample is biased - it is highly self selecting, **it is a minority group of those motivated to reply**. Therefore it is very difficult to generalise to the whole population. An example of a Postal self completion questionnaire would be a readers survey in a magazine.

d. **A questionnaire on a Web Page**
Sometimes this is essential to fill in, in order to have more access to that site. The trouble is though that many feel under no obligation to tell the truth.

7. General comments

a. A lot of data can speedily be collected, but questions often simplify reality.

b. Many students, and the general public, think that questionnaire writing is easy. It is not! It is extremely difficult to do properly in such a way that the results are worth publishing and the findings are broad enough to be of wide interest and applicability.

c. It is a good technique to get information on attitudes, beliefs, and motives.

d. A large amount of data can be collected in a short period of time.

8. Reasons why piloting is vital

A pilot is a trial run of your questionnaire on people similar to those who will be taking it later. No matter how good the researcher is, only a pilot will uncover the little misunderstandings and other errors. Commonly, a teacher of five classes would use one class for the pilot, and the other four classes for the actual research. A pilot is a form of feedback at an early stage.

a. **What is obvious to you may not be obvious to others**
Researchers get very close to the subject they are studying. They tend to absorb the technicial language, and to forget that language which is commonly known to them may not

be commonly known to others. In the process of piloting, hopefully, such misunderstood or not understood words will be identified.

b. **In order to make sure that when there are options, all the main responses are covered**
So, in an early pilot, you might want to have for each question the final one, ‘none of these, please specify’. or ‘other, please specify’. But if in your real work you get more than 10% using such a category you have not done your piloting to see what the possibilities are.

For example, if you do a survey as to which languages people speak, and you have the following options: Arabic, French, English, Other. Then you use the questionnaire in Sousse. It is quite possible that there will be a large number of responses for 'Other' since Germans were the largest nationality of tourists in Tunisia. Good piloting would have picked this up, and an additional option added. Those replying ‘other’ in a questionnaire should be rare.

c. **In order to test the instructions and layout, and to check that they really are clear**
Pay attention in the pilot not only to the wording of questions, but also the division of questions into sections, and the format of the questionnaire.

d. **To see if people from your target population really can answer the questions in the time you set**

e. **Feedback on the questionnaire is needed from representatives of the target group**
Usually, the director/supervisor of a student will advise on questions. Also, a student will often get feedback from other colleagues and students. But this is not enough. Actual representatives of the research population need using. You may also want to give them a structured interview to get comments on the questionnaire afterwards. For Masters work 2-3 interviews is usually enough, but at

least ten, or one class of students is needed for a pilot in doctoral work. When a questionnaire is piloted it is often useful to follow up by an interview to discuss the problems they noticed.

> **Those chosen for the pilot should match those of the population you intend to ask in the main study.**

f. **Piloting avoids the problem of printing large quantities of material, then finding that there are mistakes**

g. **Interviews should also be piloted!**
It is important to practice interviewing, as there are distinct interviewing skills that most people have to learn - they do not come naturally. Recording yourself and listening to yourself is a great method for this. Also, at the end of the practice and pilot interviews you can ask the interviewee to give you feedback on the experience of being interviewed.

h. **The main problem with pilots**
The main problem is that you cannot use the same questions and the same people again. Therefore the data is often collected then routinely rejected.

9. Types of question

a. **Closed items**
These require a choice from 2 or more fixed alternatives such as yes, no, don't know. NB the alternatives offered must be exhaustive ie cover every possibility. They must also not be confusing. The following incomplete question is difficult to answer.

> **Where do you live?**
> 1. Europe
> 2. Africa
> 3. Middle East

The problem comes with the distinction between Africa and Middle East. In many ways those living in North Africa feel closer, because of the common Arabic language, to the Middle East than they do to Africa, often defined as 'Africa south of the Sahara'. Therefore the following is much clearer. Notice I have also changed the region order to put the Middle East before Africa.

Where do you live?
1. Europe
2. Middle East and North Africa
3. Africa (South of the Sahara)

Closed items mean greater uniformity of measurement hence greater reliability, and can be coded easier. They are easy to analyse since you simply count the results for each option. But, they are often superficial, can annoy those who do not find the alternative they want, or they force people to use responses that are inappropriate.

Example from a job questionnaire of a bad question
In a questionnaire I was given when applying for a job, I was asked if I was an extrovert or an introvert. This is known as a loaded question: it has many assumptions in it, many of which are questionable. For instance:
1) The distinction assumes I am mostly one of these (introvert or extrovert) most of the time.
2) The distinction assumes that I will be consistently one of these.
3) The distinction assumes that I cannot be sometimes strongly introverted, and sometimes strongly extroverted.
4) The distinction is assumed to be meaningful and useful, an assumption that is highly questionable. The labels 'extrovert' and 'introvert' are so vague and inconsistent that they are almost meaningless. Researchers would say they have zero validity. Their popularity does not give fair justification for their use. The deadly question

to ask of such a question is **So what?** Even if the distinction is valid, what are the consequences?

Therefore, such a question should not have been in the questionnaire. Possibly it could have been included in an interview, where the problems with the question could have been politely discussed. Unfortunately, when I refused to answer the question directly, and explained that I am both, depending on circumstances (and so on), I was rebuked by the one who interviewed me later with the question "Do you want the job or don't you? If you want a job, submit to the questions, and do not try to correct them!" I did not get that job.

b. **Scale items**.
1) *ratings* see Burns 2000:573.

Ensure that the midpoint is genuinely in the middle.

Strongly agree	Agree	Disagree

should be

Strongly agree	Agree	Neutral	Disagree	Strongly disagree

eg "The rules of football should be changed so that there are at least five goals in any match."

There two other problems with this example. Firstly, some people genuinely do not know much about football, therefore, another option needs to be added

Strongly agree	Agree	Neutral	Disagree	Strongly disagree	Don't know

Secondly, since choosing the middle answer, Neutral, is the easy option, and you may want to force people to either agree or disagree, then you may choose to use a six point scale, with the option Don't know.

Strongly agree	Agree	Mildly agree	Mildly dis-agree	Dis-agree	Strongly dis-agree	Don't know

The problem with this is that there is still the option 'Don't care' which is still not available. There is a difference between 'neutral' and 'don't care', but many people would think they are the same. Therefore, since we often want to force people to decide, we have to deliberately exclude these options.

2) *Ranking, rank order*. Asking people to put items in order, first, second, third etc. These questions are not normally liked, they are a fiddle to do. Make sure they are not too long if you use them. Consider asking people to choose 2/5. This is much easier.

3) *Picking*. eg which languages do you speak? Easy to do.

4) *Categorical response* eg True/false
Arrange boxes vertically, to get round the errors when people mark the blank space after the word, instead of in the box. So for example

Male ☐ Female ☐

Can result in

Male ☐XFemale ☐

In this case, which is it, male or female?

Male ☐	
Female ☐	

It is much better to work vertically.

c. **Open-ended items**
These are the essential ingredient of unstructured interviewing. eg what aspects of this course did you most enjoy?

There are several problems. People may be stuck for a reply, but in a closed items, that might jog their memory. The other major problem is how to code them, or content analyse the responses. How do you analyse the responses afterwards? There are techniques, but they are not easy, and they are time consuming and error prone.

The advantage of open ended items, in particular when used in interviews, is that they allow probing, misunderstandings can be dealt with, they can test the limits of someone's knowledge or opinions, and can get closer to a summary of what people believe. The unexpected or unanticipated can also be useful, and followed up, so getting into areas where you may not have thought about.

d. **Take care over common, everyday terms**
You may have to provide a definition. Consider a questionnaire studying the incidence of bullying. The vocabulary is very familiar and is used widely, but it is not clear that they are used the same way by everyone. How many times have you been bullied this week? There is wide variation as to what is considered to be bullying. Some might think it is a single incident of name-calling. Others might think this means over an extended time, and physical threat or action.

Therefore, one might choose to define bullying. This imposes your definition. The danger here is that by presenting bullying as an objectively defined phenomenon the researcher is no longer gathering data on the extent to which people objectively feel bullied. Some might feel bullied, but not by the definition and vice versa - some students who previously never considered themselves to have been bullied might now think so, in the light of the definition.

You might first have to ask people what they understand by the term, (what do you understand to be bullying?) and to accept their definitions, and to focus on their perceptions.

10. The overall 'schedule' ie layout.

a. **Use an Introduction.** This should include questions to put people at their ease. Commonly a few biographical questions are asked.

b. **Not too long!** This means being cruel in your focus, and only asking a question if it really helps.

c. Organise questions into groups

d. **Put important questions first**
Do not put important questions right at the end when people are tired and fed up.

e. **Number well**

f. **Do not get too crowded**
There is of course a tension here. Overcrowding does not work. Taking more space usually means greater clarity. But short, one page questionnaires are desirable.

g. **Use spoken language**
Questions asked orally should be worded in oral English, using informal language. In bilingual situations where English is not well understood, the questionnaire needs to

be in a language people are comfortable with.

h. **Make sure the questions are actually answerable!**

i. **Avoid double questions**
Avoid questions such as,
- do you like English and Maths?
  Suppose someone likes one and not the other?
- Is the text informative and interesting?
  If Informative=Interesting, then you have repetition, if they are different then you have a double question.

j. **Avoid ambiguous words**
Words which can have more than one possible meaning, or are vague and general, should be avoided.

k. Avoid leading questions
In Britain, there was a popular book and TV series called "Yes Prime Minister" (Lynn J, & Jay A, 1989, "The complete Yes Prime Minister" BBC publishing, page 106). The episodes are usually with three characters: the Prime Minister Jim Hacker, his chief civil servant Sir Humphrey Appleby, and the prime minister's personal private secretary (a more junior member of the civil service) called Sir Bernard Woolley. In the episode called "The ministerial broadcast" (Series 1 number 2) there is a discussion about how to influence opinion polls by using in them a series of directed questions.

There had been a poll which showed that voters believed in bringing back National Service. Sir Humphrey did not like this, and proposed another poll which he predicted would show that the voters were against bringing back National Service. Here is how Humphrey taught Bernard to word the poll questions in favour of National service. He asked a series of questions, to which the natural answer was 'yes'. I have changed the formatting to make it clearer.

1	– 'Mr Wolley, are you worried about the rise in crime among teenagers?' – Yes
2	– 'Do you think there is a lack of discipline and vigorous training in our Comprehensive schools?' – Yes
3	– 'Do you think that young people welcome some structure and leadership in their lives?' – Yes
4	– 'Do they respond to a challenge?' – Yes
5	– 'Are you in favour of National Service?' – Yes

Naturally people say yes. "One could hardly have said anything else without looking inconsistent. Then what happens is that the Opinion Poll publishes only the last question and answer."

"Of course, the reputable polls didn't conduct themselves like that. But there weren't too many of those. Humphrey suggested we commission a new survey, not for the Party but for the Ministry of Defence. We did so. He invented the questions there and then:"

1	– ‘Mr Woolley, are you worried about the danger of war?’ – Yes
2	– ‘Are you unhappy about the growth of armaments?’ – Yes
3	– ‘Do you think there’s a danger in giving young people guns and teaching them how to kill?’ – Yes
4	– ‘Do you think it is wrong to force people to take up arms against their will?’ – Yes
5	– ‘Would you oppose the reintroduction of National Service?’ – Yes

This story nicely shows how a series of leading questions can lead to a desired response. Therefore in serious research it is very important to avoid such questions
NB, see similar commentary on the wording of questions used in Interviews in the next chapter.

11. Advantages of a questionnaire

a. They are useful when the instructions and questions asked are simple, and the purpose of the survey can be explained clearly in print.

b. Each respondent receives the identical set of questions, phrased in exactly the same way. There is standardisation, with no interviewer to influence the person, therefore the reliability is higher.

c. Errors resulting from the recording of responses by interviewers are reduced.

d. Respondents are free to answer in their own time and at their own speed.

e. Fear and embarrassment which may result from direct contact are avoided.

f. Questionnaires can guarantee confidentiality, hence the responses may be more truthful.

12. Disadvantages of a questionnaire

a. It is difficulty to secure an adequate response, especially when mailed.

b. There is a sampling problem when return rates are low, which means bias becomes a problem. There is the question of why did people not reply.

c. It is hard to write clear questions.

d. It is an unsuitable method when probing is desired.

e. Ambiguous, incomplete, or inaccurate information cannot be followed up.

f. There is non-flexibility. People may not fully express their opinions because the options do not permit this, or, if open ended, how do you systematically analyse it?

g. There is no opportunity to acquire supplementary observational data.

h. The question of why, ie the motive for replying, is unknown.

i. Questionnaires will not work for the very young, illiterate, or some disabled people, hence the importance of the pilot to see if people can do the work themselves.

j. There is the distinct possibility of misinterpretation of the questions by respondents.

k. Lying is easier, and cannot be confronted.

13. Example of wrong interpretation of a question

It is all too easy to misinterpret results of even a simple questionnaire. There was a company that was writing a new "vision" statement. It went through several drafts over the years. Finally, all employees were sent a copy with an invitation to comment or question if they so wished. Out of a workforce of over 500, there were only four replies, and each one of these was requiring minor clarification of wording. The director then sent out an email announcing that the statement had been accepted fully by the workforce, since no one had objected.

That a director can make such an ignorant statement is alarming from the point of view of the competence of the director, and from a logical point of view. There are many possible reasons why the workforce did not reply. Perhaps they were too busy. Perhaps the statement meant little to them so they did not care in any way. Perhaps they did disagree but dared not speak out for fear of consequences. Perhaps they did disagree, but saw the disagreement as too trivial to be worth mentioning.

Even if every worker had been required to send in their views, there is still the distinct probability that very few would have disagreed with the director. One possible solution is to use a five or six point scale, then to interpret everything except Strongly Agree or Agree as Disagree. **Out of politeness, people will agree, therefore the sign of disagreement is that they only Mildly agree.**

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CHAPTER 28
INTERVIEWS

Three broad types of interview
Informal unstructured interviews – see point 6
Group interviews – see point 7
Formal structured interviews – see point 8
NB. These types are NOT mutually exclusive. For instance an interview may begin informally then finish formally.

1. **Types of people interviewed**
   a. **The expert** is interviewed as an individual with specialist knowledge.

   b. **The ordinary person** is interviewed as representative of the group being studied.

2. **When persuading people to take part**
   It is sometimes not easy to persuade people to accept being interviewed. There is a general tactic of **not** suggesting an easy way to refuse.
   - 'Oh I see you are busy, shall I come back tomorrow' **BAD**
   - 'Oh, you are busy, when would it best suit you for me to come back?' **BETTER**

3. What people usually want to know about your research

The question of how much you can say has been discussed in the chapter on ethics. There is a real problem sometimes that a researcher cannot say too much, for to be explicit about the research would be counterproductive. As much as possible you should be prepared to answer the following questions.

a. Who are you and where are you from?

b. What do you want?

c. Why choose me to help you?

d. Why should I help you?

e. What will happen to the information I give you?

4. Disadvantages of interviews

a. Any note taking demands fast selective writing, with many abbreviations.

b. There is always the danger of forgetting or misinterpreting points made, or of not being able to understand the notes afterwards. This can be counteracted by:
- Coming back to the person to query and develop ideas
- later giving them your written record and inviting feedback.
- Notes made should be written up neatly, the same day if possible. It is often wise and helpful to plan two interviews, so that misunderstandings can be cleared up, and uncertainties can be settled.

c. A great deal depends on the skills of the interviewer. In discussion of sensitive areas the talk can be very selective, and the researcher can easily collect information reinforcing their own bias.

d. If someone else did the interview, would they get the same responses?

e. It is very hard to evaluate such interviews.

5. Advantages of interviews

a. They are very natural, with much freedom to discuss, to range over many subjects, to followup on unforseen points, ('Tell me more about ...').

b. If necessary, no notes need be taken at all at the time.

c. One can gain a real depth of insight, and one does not have to have definite questions or hypotheses.

d. It is an invaluable exploratory tool, to explore a new situation, to clarify or elaborate hypotheses or questions. In this case it is used before questionnaires.

e. The researcher gains, in terms of trust, confidentiality, and relationships.

f. Interviews can also be used after questionnaires. In this case, some of the people are selected for followup, for in depth more detailed study of the topics covered in the questionnaire. They help to gain depth, to improve the quality of your interpretation of the questionnaire results.

6. Informal, unstructured interviews

These are usually open ended. The interviewer may have a list of topics they want to discuss, but nothing more. The order of the topics, or the phrasing of the questions, is not important. Usually in the first interview some explanation of the research is given, with statements about confidentiality and the use that would be made of the interview. The interviewer needs to listen well, and guide the conversation without imposing their own bias. Broad, open ended questions can be explored in unstructured interviews.

Sometimes there is a series of informal interviews, with previous ideas being checked and extended. When this happens, usually trust grows, and more information comes later that would not otherwise have been given.

7. Group interviews

This is a relatively neglected technique. With a good leader, the various members of a group will be drawn into spontaneous discussion in which they prompt, stimulate, and correct each other, and add extra information. Teachers are notorious for often having strong opinions, and usually being free at expressing them. Therefore a group of teachers frequently have a good discussion. The disadvantage of course is that some things will not be said, because of the public nature of the group, and, sometimes people will attempt to score points over each other instead of fairly discussing the issue. Nevertheless, a group interview will sometimes stimulate interest, and get people thinking in a way that individual interviewing would not. Of course, a group interview can always be followed up with individual interviews.

8. Formal (structured) interviews

The aims are to have uniformity of questions, with a rapid quantification of answers for analysis. The human element must be standardised. A good formal interview passes the test question 'Could this schedule be handed over to someone else for analysis without them having to go back to the interviewer to ask what certain answers mean? Could someone else do the interviews and get the same results?' [**schedule:** technical term used by researchers for the written protocol and content of the interview or questionnaire].

As an example, we can discuss the taking of a census. Usually (at least in Britain) the questionnaires are given to each household, and the household owner is responsible to answer all the questions. But sometimes, perhaps because this person cannot read, the census taker must conduct a formal interview, in which the written questions are asked orally, and the interviewer writes down the replies.

Preparing a formal interview implies:

a. Good prior knowledge of likely possible answers, perhaps derived from informal interviews.

b. The schedule should be thoroughly checked by critical colleagues.

c. The possible answers need listing, and need to cover most eventualities, so that the open ended 'catch all' response "other, please specify" is used rarely. This is similar to questionnaire design.

d. The schedule needs piloting. Only in exceptional circumstances should this step be bypassed.

e. The analysis of the interview is built into the schedule, so that it is easy to analyse afterwards. This means that while the interview is being planned, how the data will be analysed is also planned.

You must plan how you will analyse the data at the time you are planning the questions.

10. The design of schedules

a. The principle of parsimony
Ask for the **minimum** of information required. Do not ask for information you already have or could easily get by other means, unless you choose to use the questionnaire to check and confirm information you already have. A question, to be included, should be relevant to the broader question being considered. Therefore continually ask yourself why each question is included. 'It is interesting' is not a good enough reason to include it in a schedule.

b. Questions must be answerable.
This is an obvious point, but not as easily practised as might be thought. To ask people how often they visited a

cinema last year is unfair to all except the few who can say quickly 'never' or 'once a week'. The questions need to be easy to answer, without too much thought as to what the question means, or to remember the information.

Asking how long someone has been in their job, once someone has been there several years, often requires thought to give an exact answer. But if the question is asked with categories, 1 year, 2 years, 3-5 years, 6-10 years, over 10 years, then a speedy response can be obtained.

c. Avoid ambiguous questions

- In a survey on reading habits, **How long is it since you last borrowed a book?** The researcher assumed books were borrowed only from libraries, whereas books can be borrowed from several sources.

- **When your first child was born did you want a boy or a girl?** Answer: **Yes! Either will do!**

d. Avoid leading questions

These are questions which, in the very way they are put, tend to influence the answer that the person gives. Eg any question beginning with **Do you agree that ...** is a leading question. It is better to say **Do you agree or disagree with the statement that ...** or **Do you agree or disagree about the following statements..**' or **How do you feel about the following statements...**, followed by the categories:

strongly agree
moderately agree
neutral
moderately disagree
strongly disagree
don't know

e. Avoid double questions

Eg **How often do you go to the cinema or theatre?** The answer is obviously so often to the cinema, so often to the theatre. This is asking two distinct questions. Maybe someone goes often to the cinema and never to the theatre. Therefore it is better to ask two separate questions, and later group the replies and count them as one question if you wish.

f. Avoid jargon and technical terms

These must not be used. In practice they are extremely difficult to avoid. The researcher gets so involved in the work, and in the technical words, that they forget these words are unfamiliar to other people. Any questionnaire needs thorough checking just to avoid technical terms. Researchers should use friends, family, and other students, and these helpers should be asked specifically to look for words they think people will not understand.

g. Avoid negative questions

In general, a negative construction is more difficult to understand than a positive construction. **I would study a foreign language even if it was not required** is difficult. This is easier: **I would study a foreign language even if it was an optional subject.**

h. Questions for an interview should be written in spoken form

Questions that are fine when written, when read aloud can sound too heavy or clumsy. 'In what year did you commence secondary education?' would be better put as 'what year did you begin your secondary education in?' You must write down the questions in the language you intend to use in speech. This means also that if necessary, the questions should be in dialect, not in classical Arabic. The goal is clear communication, not to present a good style.

i. Questions dealing with emotional issues

Where there are 'oughts' in a society, people will tend to give a reply they think they 'ought' to give. Thus questions on for instance smoking will probably result in replies which **understate** reality. On the other hand, at least in Europe, a question asking how many books people read will probably get **overstated** replies, since book reading can carry prestige. If you carry out a study of social mobility, you might want to ask new graduates 'Do you think your father is of lower social class than yourself?' This question might get to the heart of the issue but would be embarrassing to ask.

Obviously, with emotional questions, it is vital that the researcher has a good relationship with the people being interviewed in order to get a fair credible answer which is detailed enough to be useful.

k. Questions must be answerable truthfully

The very fact of suggesting things to people tends to result in inaccuracies. One market research into the particular brand of ready-mix pudding (desert) named the article and asked housewives how often they had bought it. The results totalled four times the actual sales over the period. (Reported in Mann 1985:136, see 'Niceness effect' below).

l. Questions must not make people refuse to answer them

If a question seems like an odd change of subject, it could be queried. If a survey on political questions suddenly had a question about the husband-wife relationship the respondent could feel it was a sudden change of subject and would resent it, even if they did not say so. "It might be that the survey was aimed at testing a hypothesis that happily married couples tend to vote more conservatively" than unhappily married couples, but unless this was clear to the informant "the questions on marital relationships would probably seem irrelevant and impertinent". (Mann 1985:136).

m. The writer of questions must continually put themself into the respondent's shoes

It is easy to forget this when you have been working on a subject for months, and you forget that what you know so well may be unknown to others. To ask a single person about his family could mean his parents and siblings, but to a married man this could mean his wife and children.

"In a survey of student activities one almost insuperable problem was to try to find out how many hours a week various sorts of children spent on 'practical work'. This term meant so many different things to different people that the results were almost impossible to classify" (Mann 1985:138).

n. YES/NO questions should be avoided

They usually do not reveal much information.

o. Do not ask for meaning, ask for use

If you ask for meaning, the reply is usually a brief definition. Most people are not good at giving definitions. But if one asks for examples of how a word is used, an informant will reveal relationships between concepts.

p. Avoid the "niceness effect"

Most people who answer questions want to be nice to the one asking, they want to create a favourable impression, they want to be helpful. The Welsh people are famous for wanting to be helpful to any lost traveller, and will always give directions when asked, even if they do not know the answer. They always finish with the famous phrase 'you can't miss it'. There are various ways of avoiding this niceness effect.

- Ask people something you already know the answer to, and see if people give the correct answer – to see if they are really knowledgeable.
- The main method is to ask the same question in more than one wording at different points in the questionnaire.

- The other method is to encourage people to make their mind up, and have a six point scale not five, so that the middle value cannot be chosen.
- Ask people to state something that is bad, and something that is good. For instance, in feedback on a seminar, the public could be asked to state what they most liked about the presentation, and what they least liked.
- If the niceness effect is expected, then using a seven or eight point scale allows people freedom to have degrees of niceness.

For instance: What do you feel about inviting the conference speaker to come again to the next conference?

Strongly disagree 1 2 3 4 5 Strongly agree

Most people, out of niceness will circle 3, 4, or 5, on this five point scale. But you could use a seven point scale

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Later, score 4, which technically is neutral, can be interpreted as 'disagree', and only 3, 2, or 1 taken as representing true agreement. Because people do not like to express disagreement, then the worst they can say is to only mildly agree. **Therefore mild agreement can be interpreted as disagreement.** Another way of putting it is that **when people want to express disagreement they will choose the mildest form of agreement.**

q. Avoid overinflated opinions of ability

Generally students overestimate their ability in languages. This can be checked for (controlled for) by actually testing them. For instance, in my work on faux amis, I wanted to see how influential they were. Therefore I first asked students to score some faux amis for how confusing they were. I then tested them using a sentence gap exercise. All the students overestimated their ability.

11. Records of interviews could be:

a. Verbatim recordings

These are later transcribed (maybe selectively transcribed, ie only parts transcribed in full). This takes a lot of work and many people do not accept to be interviewed if it is recorded. Note that technically it is not as easy to do as one might think. It is difficult to unobtrusively record a conversation, especially if it is between a group of people in a noisy setting. You must try out, 'pilot' your equipment and techniques first. There are also standards for transcription that you need to find and follow. The transcript counts as raw data. It may be important enough to put in full into an appendix. Otherwise, summaries in an appendix will do, along with a sample transcript.

Nowadays, with MP3 recorders, interviews are easier to do. See Chapter 19 for details of Express Scribe: software that enables controlled playback, line by line, so greatly speeding up the transcription process.

b. Notes taken, and then typed up later, with additions made from memory

It is often difficult to get permission to record an interview, but it is usually quite easy to be allowed to take notes, and to even show the interviewee anything you have written which you think you might wish to formally quote. Another tip is to record your commentary as soon as possible afterwards, then listen to your commentary later, and write your notes based upon your memory and whatever notes you may have. Then, it is often a good idea to have a second interview, or even a discussion over the phone. If you explain that you really want to get it right, and you really want to see if your summary is accurate, you can present your ideas with the spirit of "correct me if I am wrong, but is this what you are saying?".

Sometimes you can work in pairs, and one person take notes while the other talks. This is commonly done for instance with the chairperson and a secretary in committee meetings.

12. Analysing interview data

A structured interview is analysed and discussed just like the items in a questionnaire: the answers to each question are counted, and interpreted in relation to the research question. With unstructured interviews, then detailed coding and summarising is needed. Again, the information is presented in terms of the research questions. This is explained in detail in the next chapter.

Often interviews are used in addition to documentation and questionnaires. In which case they are often useful for giving more depth and interpreting the answers in the questionnaires.

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CHAPTER 29
DATA ANALYSIS

Introduction

Many new researchers are able to write clear research questions, and collect data through documentation, questionnaires, and interviews. Then they really do not know what to do next. In particular, how does one analyse pages and pages of qualitative data from interviews or from open-ended questions in a questionnaire? This new chapter explains and provides some solutions. It makes suggestions that are easy to understand, and provides ideas rarely found in other textbooks. In addition, some examples are presented in full, with a commentary. The examples are chosen because I know them well (they are from my own thesis) and because they are small distinct pieces of research in their own right. Therefore the examples can be used to illustrate some of the other principles of clear hypotheses leading to clear data collection and analysis.

It is very important for researchers to read good examples of research, and to read them with their eyes open, ie read them noting the patterns, features, and how the research is actually done and presented.

Reminder 1. Plan data analysis methods before data is collected

In the Research Proposal, the questions/hypotheses will have been clearly stated. There will be matching and appropriate methods. Some indication must be given as to how the collected data will be analysed to answer the questions. Before data is collected, these plans need to be made in detail.

Reminder 2. The pilot is the stage to try out the data analysis as well as the research tools such as interview or questionnaire

Any research tool needs testing, trying out – piloting. With questionnaires you are looking at clarity of the questions, layout etc. A pilot is also the stage to try out your data analysis methods.

Reminder 3. Raw data belongs in an appendix

When the data is extensive and vast the basic figures, the raw data, can be placed in an appendix. In the results you give a highly compacted summary.

1. **Analysing questionnaire data: tick one box**
   For the 'tick one box' style of question, data analysis is simply a matter of counting how many ticked each box. If you have different groups such as teachers and students, you will want to list these results separately for each group. In your commentary you will need to compare the data with what you expected.

Example 1. Gap filling exercise to test knowledge of faux amis
(Taken from Chapter 8 and Appendixes 9 and 10 of Lowe 1992). This is an edited extract from one of the results chapters which involved a questionnaire. Only one of the questions is provided in full. Note, all my results chapters had the following standard format:
- Introduction
- Sub-hypotheses
- Results
- Discussion (restricted to factual commentary and interpretation of the specific sub-hypotheses)
- Sub-conclusions

In the Introduction, provided in full below, note how I took the general theory being tested – that you would expect a constant language of science – and applied it to one specific area: faux amis. I had already established that there are faux amis in science – a finding which is significant in its own right. The question here addresses how significant these faux amis were to a group of users.

Introduction
A strict view of CSL (Constancy of Scientific Language) implies that there are no faux amis in scientific language. The question asked in this section is, given that faux amis exist, what is their significance? Do they cause difficulties to pupils?

If CSL is even partly valid, then even when faux amis exist, they will not matter, they will not cause difficulties, and they will be widely known and accommodated for by teachers and pupils alike.

The trouble with faux amis is that they are subtle: it is so easy to assume a word is the same in English and French, and to be in error. Once a word is known to function sometimes or always as a faux ami then the main difficulty of ignorance can be removed. Therefore in designing a questionnaire in a way that so obviously tests mastery of faux amis I was avoiding the main problem of faux amis. Ideally tests of faux amis need to be concealed so that pupils would be unlikely to guess what I was testing.

In the event the form of test used was such that it tested how confusing faux amis are even when highlighted . In fact, if CSL is valid, then highlighting them should be even more reason for them not to cause difficulties, for known faux amis would give no problems.

It could be argued that the test instrument is a test of English. This is a fair argument, but the test instrument was more than that. All the words chosen were well known, and, with the exception of 'electrical engineer' and 'order of magnitude', had been met in the lessons.

It would have been interesting to give this English test to the pupils at the French school, and to design a test in French for the English school. There simply was not time for this refinement, though three of the six questions were formulated starting from French phrases as explained in Chapter 6 'Procedures'.

In the sub-hypotheses I spelt out in clear detail what I would expect to find if CSL was true.

Sub-hypotheses
Given that faux amis exist, then if CSL is even partly valid, faux amis will not matter, they will not cause any difficulties, they will be known and accounted for by the pupils. Pupils will be able to cope whenever there is a lack of one to one correspondence between words.

Extract from the questionnaire and the corresponding data – in this case supplied in appendixes

In the following questions there are sentences to fill in with the missing word. For each question use one of the possible words provided. Use the word which is the most likely to be correct. Each of the "possible words" may be used once, more than once, or not at all.

Possible words: A1 experience A3 experiment
A2 experienced A4 experimented

Sentences to fill in

a) The .... showed that the water boils at 100^{0}C.
b) Science is built on observation and ....
c) He is an .... doctor.
d) This is an .... you must never repeat at home.
e) The .... was set up as above.
f) I had a most unpleasant .... yesterday.
g) Learning biochemistry can be a difficult ....
h) Recently, some people in Tunis .... a small earthquake.

The raw data was collected as a small table, with an extra column for 'no answer' labelled with the well known mathematical symbol for 'empty set' ∅. The starred answer was the expected answer. Note how simple this table is, and easy to interpret.

	A1	A2	A3	A4	∅
a	1	0	88*	0	0
b	30	0	54*	0	5
c	2	80*	1	5	1
d	30	0	53*	0	6
e	2	0	85*	0	2
f	79*	1	9	0	0
g	71*	1	11	3	3
h	3	57*	1	26	2

Extract from the results showing how the main findings are presented – the data belongs to an appendix. Note also the informative commentary.

Experiment and experience

Sentences a) and e) gave no problems of faux amis: students were well aware that 'experiments' are done in class. This is evidence which, if taken on its own, is in favour of CSL. Sentences b) and d) led to 'experiment' being confused with 'experience' in 30/84 (= 35%) and 30/83 (= 36%) of attempts respectively. In both these cases the questions had been set based on French phrases, as explained in Chapter 6 'Procedures'. Sentences c) and h) led to a confusion of 'experienced' with 'experimented' (French: ' expérimenté') in 5/88 (= 6%) and 26/87 (= 30%) of attempts respectively. Sentences f) and g) were put in as controls in that they both use the word 'experience' where there is no faux ami with French, ie when ' expérience ' is an ami loyal. It is interesting then that some students (9/89 = 10% and 11/86 = 12.8% respectively) when forced to think about the subject thought there was a faux ami when there was not. This is evidence against the sub-hypothesis of this section.

4. Analysing questionnaire data: tick one or more boxes

Here the situation gets a little more interesting. You could simply count each box and present the overall results – again, per distinct group. What is more interesting is if you notice a trend, that for instance the people who tick box 2 are also likely to tick box 5. There are statistical methods and programs that will do this for you, but you can do it for yourself using simple pen and paper for anything you notice.

It is always a good idea to count, for each question, how many gave ‘no answer’.

Example 2. Attitudes to four Arabic dialects

[This example is invented, for the purposes of providing a worked example].

Suppose that you have asked people to place in rank order, their attitudes to the dialects of North Africa. You list four countries: Mauritania, Morocco, Algeria, Libya.

Now, the analysis depends partly on what you want to do.

Analysis 1. Count and rank the choices

You could simply count, how many put Mauritania first, how many put Morocco first etc. Repeat this for how many put Mauritania second.

	Mauritania A	Morocco B	Algeria C	Libya D
First choice				
Second				
Third				
Fourth				

The problem with this is what to do with people who express a first or second choice but do not provide a third or fourth choice. Since people will almost always answer for the first and second choices, then the results for first and second choices will be clear. But the no-answer for choices 3 and 4 mean that you cannot distinguish between them.

Analysis 2. Score the choices

You could score them, for instance, the most popular scored as 4, and the least popular scored as 1.

- Results in a clear order of preference.
- There is no problem with people not scoring their third and fourth choices.
- The most popular will get the most votes.
- If the first choice is very variable but one of them is

popular as a second or third choice, then this will show in that the overall votes cast will be the highest. It is in fact like a proportional voting system and benefits the second most popular choice. **Therefore if you use this system be sure to also use method 1 above and compare the two methods of analysis.**

Analysis 3. Count double-choices

What if you want to ask the question, which two choices commonly go together? For this, you will need to do a possibility table, and count accordingly. See the end of the chapter and choose the two/four table. There are in fact six possible two-choice combinations when there are four possibilities.

For your convenience, choice lists have been provided at the end of the chapter. They are set out in a way that is easy to follow. If you need another list for a different combination you should easily be able to write your own.

Example 3. Attitudes to eight Arabic dialects

Suppose you want to score the attitudes to eight Arabic dialects. You provide a list, and the respondents are asked to put them in order, first, second third choice etc. How do you analyse this data? There are several possibilities.

Analysis 1. Count and rank the choices

As in Example 2 analysis 1.

Analysis 2. Score the choices

This is similar to Example 2 analysis 2 above.

Analysis 3. Use a choices table

You could use a choices table but it would be a big one with a large number of possibilities – too big to include here. Unless you had a large amount of data you would not find the analysis to be very interesting.

Analysis 4. Compare the most popular pairs with the least popular pairs

People usually are clear what their first and second choices are. They are also usually clear what they LEAST like. It is common when people are asked to place a list in order of rank that they begin at the end and specify their dislikes.

Therefore, use/create a choice list/table and list all possible pairs of results. For a two/eight list this will be 28 possibilities. See the end of the chapter for more details.

5. Analysing open ended questions or interviews

Example 4. "A bad textbook is better than no textbook." Do you agree? Why?

a. This question is likely to generate several different answers. The way I recommend handling it is as follows:
   1) Type all the answers for this question as one long list in one file.
   2) Read all the answers, and identify several key words or key phrases that summarise the answers.
   3) Assign each key word/phrase a code.
   4) Go through all the answers and code them. Each answer can have one or more codes.
   5) Repeat for the next question.

b. All the above information can go in an appendix. Remember that in an appendix you can use single space *(interligne* 1 instead of the usual 1.5 or 2.0) and also use a smaller font.

f. In your results include a count of how many of each code there are, then give one example of each code.

g. There will always be a few that are difficult to code. You can include ‘miscellaneous’ as one category.

Example 5. Different viewpoints about science in English textbooks and science in French textbooks

Textbook commentary: introduction

The thesis was about words and symbols in French and English for Baccalaureate Science students in two elite schools in Tunis, one in French and the other in English. Towards the end of two years work in the schools I was able to give a detailed questionnaire to all the sixth year students (the year before the baccalaureate) in both schools. In doing so I sometimes departed from the main focus of the thesis. For the sake of completeness even these small departures were included in the thesis but were relegated to an appendix. I now find that this appendix 12 is a good example in miniature of how to word a hypothesis, collect data, and analyse it.

CSL means Constancy of Scientific Language – the basic idea tested in detail in the research.

Note about conventions: The original text is presented in this font (Calabri) and the commentary in this textbook font: Time New Roman.

1. INTRODUCTION

The pupils at the English school had had contact with the Anglo-Saxon approaches to science, as well as the French/Tunisian approaches. This had come through change of language, translated texts, lessons taught by Tunisian teachers who had spent at least a year, mainly in England, but at least one teacher had been to America. The English department was also, by common consent of the British expatriates, excellent and progressive. There were also British teachers there and the library was relatively well stocked with books in English, and sometimes there were videos available in English.

But the basic textbooks in science were translated and adapted from the Tunisian textbooks and translated texts were the main source of material for the pupils. French texts were readily available, and, as the questionnaire shows, were used to some extent by the pupils.

When they [pupils] do seek extra material in English books [from England or USA] the stuff is different enough to cause confusion. 'I looked it up but it was not the same'. 'The exercises tend not to fit the Tunisian way of doing things.' (T9:27) (A teacher reporting what children said on this question).

The introduction summarises the relevant information. Notice how every word counts which means that only relevant information was included, and the information was presented concisely. There is also explanation as to why this work was included.

2. SUB-HYPOTHESES
If CSL is valid, then when questioned, the pupils will not perceive any differences between a subject, or a textbook in English and in French. Any perceived differences are evidence against CSL.

The whole approach to the constancy of science meant that not only were symbols and many words expected to be similar, but also that the world of science was international. This had already been documented. The question to hand was whether the students at the English school, exposed to both approaches, felt there was any difference, and if so, what. Notice how the game is played of 'if CSL is true, then this is what I would expect to find'.

3. RESULTS
To the question, 'Is the only important difference that the '*programmes*' [Footnote 1.] are different YES/NO.' the replies were: YES:12 NO:67 ∅:9.

Twenty-seven pupils said that French was more theoretical, and English more practical. (A2)

Six (at least) said that the subjects had the same concepts and examples and information. (A1)

Thirty-nine said that English was clearer, simpler, better explained with only one saying this for French. (B1)

Fourteen commented how the exercises were different, usually simpler, in English though there was some limited comment on the exercises in English being more related to the practical.
Footnote 1. This was a French word, used in English in the Tunisian context, instead of 'syllabus'. As it was the word used, I chose to use it and to mark it as an unusual word with the commas.

- Note, students were asked in separate questions to explain their thoughts and feelings about the differences in French and English for the subject, and for the textbook.

- Why did I provide this footnote? Because I had done something unusual: I had adapted my English to the local Tunisian English. Questionnaires are written closely to spoken language with the emphasis on comprehensibility not on formality and correctness. But, my readership in Britain would not know this. So, I followed the convention of placing unusual words in single inverted commas, and I footnoted an explanation.

4. DISCUSSION

While comments about the English texts being generally simpler, may in part reflect the difficulties a developing country has in getting good clear national texts published, I suspect there is more than that involved. English texts do stress less the mathematics and more the explaining of the phenomena. A significant number, 31% freely pointed out that French was more theoretical, and English more practical. (See Appendix 8 for some quotations).

The question about differences being only due to the syllabuses being different was a leading question, but 76% saw differences that did exist as being not just due to this factor. It is interesting how students latched on to the approaches to the subject, the approaches to the teaching, while maintaining that the actual content was broadly the same.

5. SUB-CONCLUSIONS

There were significant perceived differences between English and French, particularly in the area of French being theoretical and English being practical. This has implications for any student changing between the systems, and needs considering in any ESP situation.

Again, note the brevity, and the strict matching of the sub-conclusions to the sub-hypotheses.

6. SELECTIONS OF PUPIL COMMENTS

Below is presented a selection of the comments made by the pupils at the English school in response to the questions as to what they found different and similar about French and English subjects and textbooks.

NB. NB. In a normal situation, results like these would be presented as a results chapter, or part of a results chapter. Therefore it would be normal in the results to include a few examples and comment on them, OR to say that you have provided examples in Appendix XX.

The material is provided in detail below so that you can see how examples can be coded, and then counted.

Classification and results summary	
A1 Same concepts, examples & information	6
A2 French is theoretical, English practical	27
B1 English clearer, simpler	39
B2 'exercises' different	14
B3 Only some words, some details differ	3

1.17 etc refers to the pupil number.

To repeat, because this chapter is cluttered, the box above, Classification and results summary, would go in the results, alongside some clear typical examples. The actual coded data would go in an appendix. Note how I have also typed what was said, with the mistakes of grammar and punctuation.

The material here is provided as an example for the reader to study. It was surprisingly easy to do!

A1 1.17	same information. the basic idea of the lesson is the same.
A2 2.1 B1	English books are simple whereas the French ones are a bit complicated. Quite more details in the French books. I like French books because there are some important details. I like English books because of their simplicity, and their introducing daily life in the domain of science. -the programs, -the names of subjects eg Newton's las (in english) => law fondamontale de la dynamique (in French). -Wider rely on daily life, for English books eg the subject of reproduction. -The theory dominates of the practicle for french books.
A2 1.17	English lessons require a lot of practical. French lessons are based on theory and they give importance to many details.
A2 2.14	English books tend to be based (apparently) on the practice. there are more practical than theory. however for french books it is just the opposite.
A1	the scientific subjects are taught in different languages however the scientific terms don't change and the formulae and the theorums are just kept the same. so it is just the same if you learn a scientific subject in french or in English. The way of teaching differs. the english way depends on the pupils however the french way is dependant on the teacher.
A2 3.6	English subjects are based on experiments. French subjects are based on theory.
A2 3.15	I prefer french books for maths and physics because they explain things and treat exercises mathematically (logically) not by using common sense (means if something is right why do we proof it). However science books are excellent in english because they are based on experimental facts.
A2 3.18	English books rely on experiments however French ones rely on calculations and theories. English books are easier. [subjects] English teachers give questions rather than problems. English teachers explain using experiments however French teachers use calcuations and theories to explain some difficulties.

A2 4.1	English books concentrate mainly of experiments and they don't interest much in algebrae and calculus, whereas French books are always full of complicated exercises which are very far from experimentation. I prefer english books since they don't complicate the ideas and they explain very well, but I'm obliged to deal with French books since our physics syllabus is based mainly on maths and applying theorums (it is exactly like the french syllabous).
A2 4.6	In french formulas are important while in english experiments are important. Some names, especially in maths are different in the two languages.
A2 4.19	French books insist on theoretical parts of lessons. English books insist on practical parts of lessons. Exercises in french books are much more difficult than english ones. All this is especially for physics. English books try to make lessons as simple as possible.
B1 2.24	French books use theories for explanation and also use a lot of algebra. English books explain things using experiments. French exercises use complicated calculations, English ones use simple calculations and experimental exercises. The French way of educating need a lot of memory and calculations are introduced in all chapters in any subject even they are not need. The English way of education is simpler enables you to retain informations and makes you understand which is very important. The French way is tiring and the pupil forgets everything/lessons after a few days. The teacher remains the most important one in the class, all the work is done by him, the pupils have a very small participation in the lesson, class.
B1 3.6	English books explain better, use simple things to explain more difficult ones, they contain more experiments that help understanding. French books contain more good & difficult exercise.
B3 4.5	[subject] They are similar because language has no effect on the scientific message.

Possibilities tables – for use see end

Two/four
AB
AC
AD
BC
BD
CD

Two/five
AB
AC
AD
AE
BC
BD
BE
CD
CE
DE

Two/six
AB
AC
AD
AE
AF
BC
BD
BE
BF
CD
CE
CF
DE
DF
EF

Two/seven
AB
AC
AD
AE
AF
AG
BC
BD
BE
BF
BG
CD
CE
CF
CG
DE
DF
DG
EF
EG
FG

Two/eight
AB
AC
AD
AE
AF
AG
AH
BC
BD
BE
BF
BG
BH
CD
CE
CF
CG
CH
DE
DF
DG
DH
EF
EG
EH
FG
FH
GH

Three/six
ABC
ABD
ABE
ABF
BCD
BCE
BCF
CDE
CDF
DEF

Three/seven
ABC
ABD
ABE
ABF
ABG
BCD
BCE
BCF
BCG
CDE
CDF
CDG
DEF
DEG
EFG

Three/eight
ABC
ABD
ABE
ABF
ABG
ABH
BCD
BCE
BCF
BCG
BCH
CDE
CDF
CDG
CDH
DEF
DEG
DEH
EFG
EFH
FGH

Use

For instance, when there are four possibilities, and you want to study pairs of choices, then you can use the table to identify all possible pairs. You could then count for each pair and see if one pair was exceedingly common, or, one pair was rare. Where there are six possibilities you either want to study the pairs, (two/six table) or the triplets (three/six table).

Four/eight			
AB CD	AC DE	**AD EF**	**AF GH**
AB CE	AC DF	**AD EG**	
AB CF	AC DG	**AD EH**	
AB CG	AC EF	**AD FG**	
AB DE	AC EG	**AD FH**	
AB DF	AC EH	**AD GH**	
AB DG	AC FG		
AB EF	AC FH	AE FG	
AB EG	AC GH	AE FH	
AB FG		AE GH	
AB FH			
AB GH			

BC DE	BD EF	**BE FG**
BC DF	BD EG	**BE FH**
BC DG	BD EH	**BE GH**
BC DH	BD FG	
BC EF	BD FH	BF GH
BC EG	BD GH	
BC EH		
BC FG		
BC FH		
BC GH		

CD EF	CE FG	**CF GH**
CD EG	CE FH	
CD EH	CE GH	
CD FG		
CD FH		
CD GH		

DE FG	DF GH
DE FH	
DE GH	**EF GH**

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