

# **Writing a Scientific Research Article in English for International Submission:**

**A 10-hr workshop series for  
graduate students**

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# Expected Outcomes: for students to acquire

- an improved understanding of the structure and underlying logic of scientific articles published in English in the international literature;
- an overall strategy for turning a set of results into an article that is likely to be acceptable for publication;
- knowledge of some specific English language features commonly used in each section of published articles, and strategies for learning more;
- knowledge of the stages involved in the process of submitting an article for publication

# Genesis of this Workshop

- Shared desire for more Chinese science to be available internationally in English
- Intersecting expertises: Applied Linguistics and Science
- Workshops for CAS scientists in Beijing and Nanjing, 2001 and Beijing 2003, 2004 and 2005 (30/workshop)
- Evaluations by participants extremely positive; their suggestions incorporated into subsequent versions
- This version has been adapted for larger numbers of students in the early stages of their PhD candidatures
- Your feedback will contribute to our research and to future developments of the workshops

# Margaret Cargill

BA, Dip Ed, MEd(TESOL)

- Has provided writing development for postgraduate research students and academic staff in Agricultural and Ecological Sciences for 15 years
- Runs collaborative paper writing workshops for state and national research organisations in Australia and at U of A
- Has taught English for Specific Purposes in Australia, Switzerland, Tonga, Vietnam, Spain and China
- Is researching the effectiveness of the approach used in this workshop; 2 papers to date
- Editor of *TESOL in Context*, journal of the Australian Council of TESOL Associations; active reviewer for international journals and conferences

# Questionnaire completion



- Please complete the questionnaire that will be distributed to you now.
- If any items are not clear, please ask the presenter for help.
- I will also ask you to complete an evaluation of the course at the last session on Friday.
- These documents will contribute to
  - improvement of this course for future student groups, and
  - my research into the effectiveness of this teaching approach for Chinese students and scientists.

# Participation in the International Scientific Community Requires...

- Understanding the cutting edge of scientific disciplines (journal subscription /internet/ database)
- Peer-review (international)
- Written and spoken English for communication with peers
- Active involvement in international conferences
- Good writing skills and understanding of the format of journal articles

# First considerations

- Many journals available – you need to select one to submit to (SCI status, impact factor, kind/level of your research are all important factors)
- Many articles get submitted – yours must meet the journal's requirements and 'stand out' for its quality and innovation
- Scientists are busy – they rely on electronic searching to find relevant articles – yours must 'stand out' as relevant and interesting

# Selecting Target Journals

- Check if the journal:
  - normally publishes the kind of work you have done
  - referees the papers
  - publishes reasonably quickly
  - has no page charges – or will waive them
  - provides reprints free of charge
  - has efficient and helpful editorial staff



# Getting the most out of publishing

- Publishing quickly is often helpful
- Publishing in a widely read journal is better for you (*citation index*)
- If you aim too high you may be rejected (resubmitting takes more time)
- Publishing where your peers will read it is important

# Getting to know a journal

- Go to the journal's home-page on the internet if it has one (or find a hard copy in the library)
  - Read the introductory materials: Scope, Readership, Objectives, Aims, etc. Does this match your research?
  - Scan the Tables of Contents of several issues over the past few years. Is your research relevant to this area?
- Publishing in an international journal = joining an international conversation
  - So you must listen before you speak (= read before you write)
  - Try to cite papers from the target journal in your manuscript, to show you are aware of the 'conversation' in that journal.

# Relevance to your writing



- You are writing your Introduction directly to these people, to convince them that they need to read your paper.
- You need to use their articles and their findings to show that you know the field.
- You need to keep up to date with the literature – subscribe to email alerts by the journal publishers, or database services online.
- Make notes as you read, and organise them so you can find them when you need to for your writing. Do not leave this till the writing stage.

# The teaching methodology



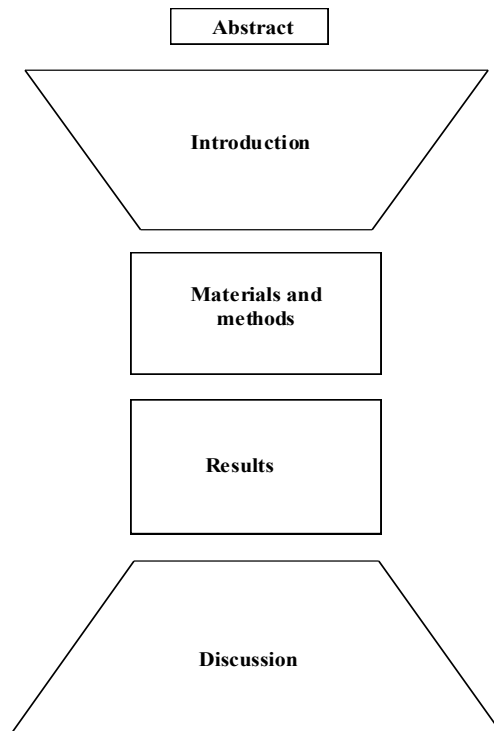
- I begin with the theory from Applied Linguistics
  - Genre analysis: a descriptive, not prescriptive approach
- But every sub-discipline has different conventions for writing papers
- In your lab groups, you need to compare my guidelines with good examples of papers from good journals published in English in your field
  - Ask supervisors for help to identify good papers
  - Together, identify the basic structure and allowable variations
  - Then use these papers to help develop your language use
  - This course will provide a framework for you to use for this identification and development

# **Article structure and 'gatekeepers' for publication**

# The IMRaD article structure

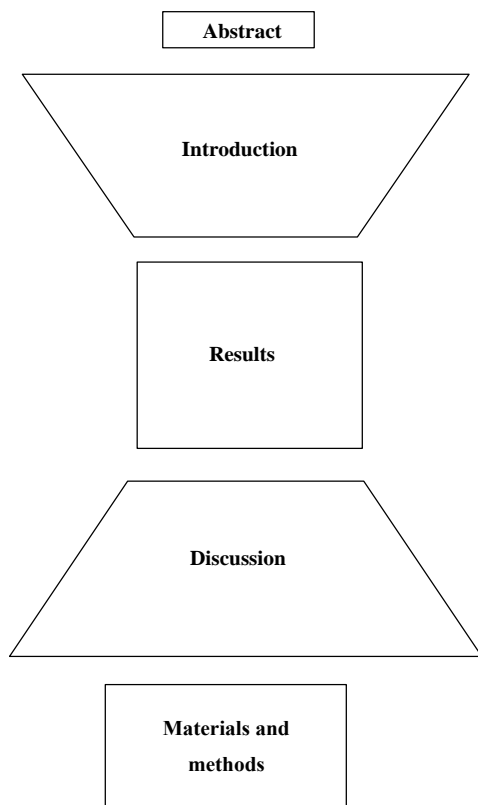
- A historical form for experimental papers that has grown out of a tradition begun in 1665
- Provides a structure to enable authors to tell the story of their research:
  - Not the story they thought they would tell when they planned the research, but
  - The story they can tell now the results are analysed and the implications thought through.
- Some variation occurs in the structure – always check your target journal to be sure
  - Scan several issues, and read several papers, for clues

# The IMRaD article: Introduction, Methods, Results and Discussion (Weissberg and Buker 1990)



- Abstract
- Introduction
- Materials and Methods
- Results
- Discussion

# For many 'molecular' papers...



- Abstract
- Introduction
- Results
- Discussion
- Materials and  
Methods



# Notes on IMRaD Diagram 1



- This is a conceptual diagram: It is the width and shape of the boxes that is important, not their depth (i.e. no reference is intended to the length of the section)
- The whole structure is governed by the Results box
- Introduction begins much ‘broader’, making firm contact with the selected audience, at the logical contact point
- Between start and end of Intro, background info. and previous work are woven together to justify the study
- Introduction ends with the aim of the present study or a summary of the main outcomes of the study (depending on the research field and the journal conventions)

# IMRaD continued

- Method establishes credibility for Results by showing how they were reached and why they should be trusted
- Discussion begins at same ‘width’ as Results, but by the end is the same width as the start of Introduction – addressing the same ‘big picture’ issue as was the focus at the beginning
- Sometimes Results and Discussion can be combined; then the paper may also have a Conclusion to address the big picture

# Class exercise

- List the headings and sub-headings
  - For your Own Discipline Article (ODA)
- Note any differences from the IMRaD structure discussed previously
- Discuss with your neighbours
  - Possible reasons for the differences you noted
- For later: as you plan and carry out your research, think about what information will go in what part, and what headings will work best for you

# Language use in the sections

- Different kinds of information are typically found in the different sections
- Language features also differ between the different sections, for example
  - specific vocabulary items, and
  - the use of particular tenses
- The exercise on the next slide features some typical wordings from several different sections of an experimental article

# Class exercise

- *Identify* which part of a research paper the following phrases came from.
- Example: It is very likely that ..... because ... (D)
- a) ..... yielded a total of ..... ( )
- b) The aim of the work described was ..... ( )
- c) ..... was used to calculate ..... ( )
- d) There have been few long-term studies of ... ( )
- e) The vertical distribution of .....was determined  
by .... ( )
- f) This may be explained by ..... ( )
- g) Analysis was carried out using ..... ( )
- h) ..... was highly correlated with ..... ( )

# Gate-keepers and their roles

- Journal Editors: these people make the decisions about acceptance of manuscripts
- Referees (also called Peer Reviewers):
  - Editors send each manuscript to two (sometimes three) of these people, who are experts in the field of the research written about in the manuscript
  - Referees evaluate the manuscript and send a report to the editor, making a recommendation about its fate
  - The editor decides, based on the referees' reports plus the needs of the journal

# Your two-audience dilemma



- You are writing for your research colleagues internationally, to inform them of your work, BUT
- If the editors and referees do not accept your manuscript, your colleagues will never get the chance to read it, SO
- You are writing primarily for the editors/referees, BUT
- The editors and referees will read the manuscript ‘wearing the hat of’ your colleagues internationally, who make up the readers of the journal, SO
- Get to know the journal well before you start to write.

# Audiences and ‘gatekeepers’

- Editors and referees are the ‘gatekeepers’ who decide if your article is ‘let in through the gate’.
- What criteria do they use to decide?
- Have you ever seen any examples of these criteria?
- What things do you think these ‘gate-keepers’ look for?
- Some knowledge of the criteria to be used can help novice authors as they write their papers
- We present here a composite set of criteria, gathered from several SCI journals



# Referee's Report Form (generic example)



- Is the contribution new?
- Is the contribution significant?
- Is it suitable for publication in the Journal?
- Is the organization acceptable?
- Do the methods and the treatment of results conform to acceptable scientific standards?
- Are all conclusions firmly based in the data presented?
- Are all illustrations required? Are all the figures and tables necessary and figure legends and table titles adequate?
- Do the title and abstract clearly indicate the content of the paper?
- Are the references up to date, complete and the journal titles correctly abbreviated?
- Is the paper Excellent, Good or Poor?

# Class exercise

- Next to each criterion on the previous slide, note the article section/s (Ab, I, M, R, D) where you think the referee would expect to find relevant evidence on which to base her/his decision.

# Implications for rest of the course

- This ‘driver’ will be a key focus as each article section is dealt with in the course
- Our goal will be to identify how authors make it clear that they are providing evidence relevant to each of these criteria
- We need to pay attention to both information content and English language usage in each section
- As a first step, we will consider
  - “Does the title clearly indicate the content of the paper?”

For a title to be effective, a reader must be able to *identify* from it ...

- the information about the research and its results that will be presented, and
- the questions a reader would expect to be able to answer after reading the article
- Consider the example on the next slide ...

# Title: 'Bird use of rice field strips of varying width in the Kanto Plain of central Japan'



## Information:

- The focus is on wild birds in relation to rice fields.
- The width of rice field strips is measured.
- Width of strips is related to visits by birds.
- The research took place in central Japan.

## Questions:

- Does the width of rice field strips affect which birds use it?
- If so, which field strip width is used most by which birds?
- What methods were used?
- Would the experiment be worth repeating for rice field strips in other places? Strips of other crops?

# Class exercise: Probing the title of your ODA

- From reading the title only, list the information you expect to be presented, and the questions you expect to be answered, for:
  - Your selected Own Discipline Article (ODA)

# Results

# Turning data into knowledge

Verify, analyse and display DATA  
to  
share, build and legitimise  
KNOWLEDGE



# Key questions to consider include:

- What data are essential for the ‘story’ of the paper?
- Will the journal accept other data as Appendices (printed) or as supplementary on-line data?

# The first step

- Prepare tables and/or figures that present the key data that form your story
- Write table titles or figure legends that highlight the key points of the story so that they ‘stand alone’ (do not need the reader to consult the rest of the text in order to understand them)

# Figure, table or text?

**The choice depends on the point you want  
the reader to get out of the data**

# Tables are useful for:

- Databases - recording data (raw or processed)
- Explaining calculations or showing components of calculated data
- Where the actual numbers are important
- Where there are numerous individual comparisons to be made, in many directions

# Figures are more useful where:

- The overall picture is important
- The results can be comprehended more rapidly through shape than through number
- The comparisons between elements are relatively simple

# Title legends

- Title – descriptive, tells you what the figure is about
- Maybe one sentence about the method
- What do the points on the figure represent?
  - eg “The figure shows the mean number of visits/bird”
- Key – explain the different treatments for different points
- Explain statistical and other notation

# Reference to tables and figures in the text

- All tables and figures should be presented sequentially and referred to in that order in the text
- Can use the same sentence format for each table or figure, just change the results

# Writing Results: The “Story” of the paper

- You present your Results in the tables and figures
- In writing about them, highlight the key points...
- ...but don't restate too much. Be CONCISE!
- Do not repeat everything from the tables and figures
- Concentrate on the important results (the ones you want to focus on in the Discussion)
- You should be able to reduce results to a series of “dot points” before you start writing the sentences



# Results and Discussion: the same or different sections of the paper?

- Opinions and practices vary...
- Some journals allow Results and Discussion to be combined
- Others do not
- What about your ODA - separate or combined?

# Writing about Results:

## *Information elements*

- A statement that locates the figure/s or table/s where the results can be found (L)
- Statements that highlight the most important findings (H)
- Statements that comment on (but do not discuss) the results (C) (Weissberg and Buker 1990)

# Class exercise: Which elements are present in each sentence?

<sup>1</sup>A total of 53 samples were examined. <sup>2</sup>Direct microscopic examination of the samples showed 20 different fungal strains, which were isolated by culture and identified to the level of genus and/or species (Table 1). <sup>3</sup>These findings show that fungi can tolerate adverse environmental changes in the vegetative form. <sup>4</sup>Table 2 shows the results of the tests applied to the isolates. <sup>5</sup>None of the fungi strains was able to grow in culture media with 500 to 5000 mg L<sup>-1</sup> of anionic surfactant. <sup>6</sup>An inhibitory effect on fungal growth and activity might be expected from the anionic surfactant level found in the ponds. (cited in Weissberg and Buker 1990)

# How to read example text from a discipline area that is not your own

- Use the concept of the ‘noun phrase’ (NP), also called a ‘nominal group’
- These are chunks of language that refer to a thing or an idea – they do not contain a verb. For example:
  - fungal strains
  - adverse environmental changes
  - an inhibitory effect on fungal growth and activity
- Using this concept, you can ‘skip over’ the NPs and still learn from the structure of the sentences in the examples

# Class exercise using the NP concept

<sup>1</sup>A total of 53 samples were examined. <sup>2</sup>Direct microscopic examination of the samples showed 20 different NP, which were isolated by NP and identified to the level of NP (Table 1). <sup>3</sup>These findings show that NP can tolerate NP in NP. <sup>4</sup>Table 2 shows the results of the tests applied to the NP. <sup>5</sup>None of the NP was able to grow in NP. <sup>6</sup> NP might be expected from the NP found in the NP.

- Now list the sentence numbers 1-6 and note whether each sentence contains elements L, H and/or C

# Tense in Results sections: summary



- Simple past tense is used when the sentence focuses on the completed study – what was done and found
- Present simple tense is used
  - when the sentence focuses on the document, which will always be there, or
  - when the sentence refers to an ‘always true’ state of affairs
- Modal verbs are used in comments, especially in ‘that’ clauses.

# Class exercise: Which tenses and why?

Using a 1.2-kb cDNA probe specific to the *uidA* GUS open reading frame, single DNA fragments of 15 and 5.4 kb were identified in the *EcoRI*- and *HindIII*-digested DNA, respectively (Fig. 1C). *HindIII* restriction sites are present close to the right border of the T-DNA and approximately 400 bp upstream from the left border T-DNA insertion site in chromosome 4 (Fig. 1B). As expected, digestion with *HindIII* liberated a 5.4-kb DNA fragment from the AMT1;1 loci, which contained the majority of the T-DNA insert. (Kaiser et al. 2002)

# Class exercise: Which tenses and why? (Using the NP concept)



Using a NP specific to the *NP*, single NP were identified in the *NP* and *NP*, respectively (Fig. 1C). *NP* are present close to the right border of the NP and approximately 400 bp upstream from the NP in NP (Fig. 1B). As expected, NP liberated a NP from the NP, which contained the majority of the NP. (Kaiser et al. 2002)



# Methods

# (Materials and) Methods

- Stated purpose is that the work can be repeated
- Have you had problems with following methods from published papers?
- Cite methods if they are previously published
- Describe in full if readers lack access to the original publication (e.g. only published in Chinese)
- All novel methods must be described
- A key purpose of the M section is to establish the credibility of the Results (i.e. why the reader should believe the Results are correct)

# How to begin the M section

- The most general information usually comes first, to give the reader an overview of the procedure, e.g.
  - the site of the experiment
  - the overall experimental design
  - a general description of the apparatus used
- Class exercise: What comes first in the M section of your ODA?

# What about Materials?

- Materials used can be presented in a separate sub-section, or integrated into the description of the Methods.
- Class exercise: Is there a separate list of Materials in your ODA?

# Organising the M section effectively (1)

- A goal of the M section is to help readers understand the Results
- It can be useful to use similar or identical subheadings for the two sections
- If M comes *after* R, some method information may be needed in the R sentences
- Investigate one example paper to see if the authors have used this subheading strategy

# Organising the M section effectively (2)

- Consider using introductory phrases to explain why a method was used, e.g.

In order to determine the root biomass in the soil, ten 51-mm diameter soil cores were taken in each plot from 0 to 100 mm depth in June and July 2004 using ... (Sayer et al., 2006)

- Or use the first sentence in a paragraph to introduce the method and then give details, e.g.

Mineralisable N was estimated using an anaerobic incubation assay as described by Keeney (1982).  
This involved ...

# Class exercise 11

- Check your ODA for examples of
  - introductory phrases to help a reader follow the logic of the section
  - topic sentences that introduce a method description

# Active/passive voice in M sections

- Passive voice is commonly used in M sections
- Class exercise: Check 2 paragraphs in your ODA for:
  - Number of active voice verbs:
  - Number of passive voice verbs:
- The next slides provide some hints about using the passive voice effectively in M sections



# Problems with passive sentences (1)

- X** A and B, collected from the Virginia field site, as well as C and D, collected at Loxton, were used.
- ✓ Four soils were used: A and B, collected from the Virginia field site, and C and D, collected at Loxton.

# Class exercise: How could you improve this sentence?

Actual evapotranspiration (T) for each crop, defined as the amount of precipitation for the period between sowing and harvesting the particular crop plus or minus the change in soil water storage in the 2m soil profile, was computed by the soil water balance equation (Xin, 1986; Zhu and Niu, 1987). [ Li et al. 2000]

# Strategies for Developing Discipline-specific English

# Key Point Summary

- Making YOUR meaning clear is the most important thing.
- Most editors and referees want to understand your science so they can evaluate it – but if the English gets in the way they cannot do so. (Some demand native-speaker standard = unrealistic expectation)
- Copying whole sentences from other people’s papers is generally not acceptable in international practice, even if the sentences are referenced.
- However, sentence templates with your own NPs inserted are acceptable – BUT check that they make the meaning you want!
- Asking a native-speaker to correct a paper is a very ‘big ask’; if you do this, make sure you have put in the work to make it as good as you possibly can.

# Sentence Templates

- In your reading you may find sentences that express a meaning very clearly.
- You can remove the NPs from it to make a ‘sentence template’ which you can re-use later.

e.g. Smith (1981) suggests that this discrepancy in feeding rates may reflect differences in light levels used in the two different experiments. Jones (1984), however, found that light level did not influence the feeding rates of these animals and suggested that the rate differences reflect differences in the density at which the animals were held during the two experiments.

= (Author) suggests that (NP) may reflect differences in (NP).  
(Another author), however, found that (NP) did not influence (NP) and suggested that (NP) reflects (NP).

# Practice with Sentence Templates

- The aim is to insert your own NPs into a template to make a sensible sentence, e.g.
  - (Author) suggests that (NP) may reflect differences in (NP). (Another author), however, found that (NP) did not influence (NP) and suggested that (NP) reflects (NP).
  - Cargill (2000) suggests that English learning outcomes for EFL science students may reflect differences in willingness to take risks. Smith (1999), however, found that risk-taking did not influence language learning and suggested that learning outcomes reflect study behaviour.
  - Class exercise: Now write a sentence using this template for your own field of study ...

# Class exercise:

- Now make a template from this sentence:
  - Previous studies of the pool burning of silicone fluids have been limited in the number of fluids tested and have not measured the spatial distribution of radiative flux nor the global radiation properties under steady mass burning flux conditions, an important consideration for measurement accuracy.

# Class exercise:

- The template :
  - Previous studies of NP have been limited in NP and have not measured NP nor NP, [an important consideration for NP].



# General Strategies for the Future

- Use the papers you read for 2 purposes:
  - the scientific content, and
  - a source of data to improve your discipline-specific English
- Select papers written by native-speakers for Purpose 2
- Types of data to collect:
  - sentence templates (as described earlier)
  - noun phrases (NPs) commonly used in your field
  - common collocations: words used together with other words
- Keep special lists of these data and learn them

# Introductions

# Introductions: the five 'stages'



1. General statements about the field of research to provide the reader with a setting or context for the problem to be reported and claim its centrality
2. More specific statements about the aspects of the problem already studied by other researchers, laying a foundation of information already known
3. Statements that indicate the need for more investigation to create a gap or research niche for the present study
4. Very specific statements giving the purpose or objective of the author's study or its principal activity
5. Optional statement(s) that give a value or justification for carrying out the study

# Class exercise

- Read the introduction on the next 2 slides.  
Decide if all stages are present, and mark where each one begins and ends. (It is possible that stages may be repeated or come in different order to that suggested above!)

# Spatial Distribution of Litter and Microarthropods in a Chihuahuan Desert Ecosystem

<sup>1</sup>In most deserts of the world, transitions between topographic elements are abrupt and watercourses which are dry most of the time tend to dissipate their occasional waters within local basins.

<sup>2</sup>Occasional torrential rainfall, characteristic of most desert regions, washes loose debris into watercourses or transports this material, depositing it in and along the shores of ephemeral lakes. <sup>3</sup>These physical processes result in a redistribution of dead plant material (litter), affect the distribution of soil water and create a heterogeneous biotic community. <sup>4</sup>Therefore, before the dynamics of desert ecosystems can be adequately understood, the spatial relationships must be clarified.

<sup>5</sup>There have been few studies of litter distribution and/or soil fauna in any of the world's deserts (Wallwork, 1976). <sup>6</sup>Wood (1971) surveyed the soil fauna in a number of Australian arid and semi-arid ecosystems.

<sup>7</sup>Wallwork (1972) made some studies of the microarthropod fauna in the Californian Mojave desert and Edney et al. (1974, 1975, 1976) studied abundance and distribution of soil microarthropods in the Mojave desert in Nevada.

<sup>8</sup>In the Chihuahuan desert, Whitford et al. (1975, 1976, 1977) described the spatial relationships for many groups of organisms, but soil microarthropods remain unstudied. <sup>9</sup>The lack of such information represents a gap in our knowledge of desert ecosystems. <sup>10</sup>As part of our continuing program of studies of the structure and dynamics of Chihuahuan desert ecosystems, we designed the study reported here to understand the relation-ship between litter redistribution and the spatial distribution and composition of the soil microarthropod community.

(Cited in Weissberg and Buker, 1990)

# Introduction Stages: Deserts

| Stage | Sentences                               |
|-------|---|
| 1     | 1-3 (or perhaps including Sentence 4)   |
| 2     | 5-7 plus Sentence 8 up to 'but'         |
| 3     | 4 (as a broad gap), 8 from 'but' plus 9 |
| 4     | 10                                      |
| 5     | (perhaps first part of Sentence 10)     |

# Class exercise

- Read the Introduction of your ODA and try to identify the stages – remember that they may come out of order, or some stages may be repeated



# Stage 1 in detail

- Helps your reader move from your ‘universe’ to your ‘galaxy’ to your ‘star’
- Your ‘star’ is not the aim of the study, but rather its particular topic area.
- Class exercise 18: For the Desert Ecosystems introduction:
  - What is the ‘universe’?
  - What is the ‘galaxy’?
  - What is the ‘star’?

# Class exercise

- For your ODA:
  - Universe?
  - Galaxy?
  - Star?

# Stage 2:

## Using references (or citations)



- Citations are used in a sentence to acknowledge that the idea/s or fact/s in it come from the cited source
- They appear in text either as a surname and a date in brackets (e.g. McNeill 2000) or as a number (e.g. 7), depending on the style decreed by the journal (check the Instructions to Contributors for details).
- They refer to the List of References at the end of the document, where the full publication details are given, again in the style decreed by the journal.
- Citations are especially important when discussing previous work in your ‘star’ area, to justify your Stage 3 gap.

# Accessing the literature

- Libraries
- Loans or photocopies from other libraries
- World-Wide Web – increasingly available through some libraries
- Reprint requests if you can identify key papers that you need
- Email contents alerts for key journals

# Using citation to develop your argument

Three possible techniques to use:

- Information prominent
- Author prominent
- Weak author prominent

You choose a technique for each sentence depending on how you are developing your argument at that point.

# Information prominent style

Shrinking markets are also evident in other areas.

(TOPIC SENTENCE) The Australian wool industry is experiencing difficulties related to falling demand worldwide since the development of high quality synthetic fibres (Smith 2000).

- This is the ‘default’ style in many areas of science.

# If you cannot obtain the original publication...

- Editors usually require authors to cite only those papers that they have actually read.
- If you cannot obtain the original, you may use this form in-text:

‘Hedging’ is a common feature of discussion sections in research articles (Hyland 2000, cited in Cargill 2002).
- In such cases, you only put Cargill (2002) in your reference list.

# Author prominent style (1)

**Shrinking markets are also evident in other areas. As Smith (2000) pointed out, the Australian wool industry is experiencing difficulties related to falling demand worldwide since the development of high quality synthetic fibres.**

- This style gives more option to show the writer's view of the cited fact
- Here, it can show that the writer (you!) agrees with Smith



# Author prominent style (2)

**Smith (2000) argued that the Australian wool industry is experiencing difficulties related to falling demand worldwide since the development of high quality synthetic fibres. However, Jones et al. (2001) reported that ... It would seem that...**

- This style also allows the use of verbs such as ‘argued’, which give advance notice that a ‘however’ is coming

# Weak author prominent style

**Several authors have reported that the Australian wool industry is experiencing difficulties related to falling demand since the development of high quality synthetic fibres (Smith 2000, Wilson 2000, Nguyen 2001). For example, Smith (2000) highlighted ...**

- Has a general reference to authors in the subject and then more than one reference in the brackets.
- Is followed here by an author prominent citation
- Is good as a topic sentence starting a new paragraph
- Note the tense of the verb!

# Avoiding plagiarism

- Plagiarism is using ideas or words that originated in another work without acknowledging their source.
- Papers will be rejected if plagiarism is detected.
- It is regarded internationally as a form of cheating.
- It also prevents your gaining credit for knowing the work of other researchers in the field, which can be important for referees.

# Compare these two versions of the same information and identify the plagiarism problem



1. Smith (1981) suggests that this discrepancy in feeding rates may reflect differences in light levels used in the two different experiments. Jones (1984), however, found that light level did not influence the feeding rates of these animals and suggested that the rate differences reflect differences in the density at which the animals were held during the two experiments.

2. This discrepancy in feeding rates might reflect differences in light levels. Jones (1984), however, found that light level did not influence feeding rates. Perhaps the difference in feeding rates reflects differences in the density at which the animals were held during the two experiments. (cited in Pechenik 1993)

# The important check point:

- It must be clear to your reader whether the idea or fact you are using in your sentence is yours, or has come from the work of another person. If it comes from another person's work, cite them!
- e.g. “Interestingly, AtNramp 1 overexpression in *Arabidopsis* also confers tolerance to toxic concentrations of external Fe(II) (Curie *et al.*, 2000), suggesting, perhaps, that it is localised intracellularly. (Kaiser et al. 2003)

## Stage 3:

# The research 'gap' or 'niche'

- There are special 'signal' words that often appear in this Stage.
- One type of signal points to an upcoming contrast (eg 'however')
- Another type indicates a problem or a lack.

# Class exercise 20

- Check your ODA for words that signal a gap

# Stage 4: The statement of aim or main activity

This stage lends itself to the creation of ‘sentence templates’ for later re-use. Class exercise: Make one from the following Stage 4:

The aim of the work described in this paper was to elucidate further the mechanisms of salt marsh succession. Our particular objectives were: (i) to examine changes in tussock size, surface elevation and species representation over a 17-year period; (ii) to characterize the new coloniser at Odiel Marshes genetically, in terms of DNA (RAPD) markers; (iii) to test the hypothesis that it is a hybrid between *Sarcocornia perennis* and *S. fruticosa*; and (iv) to investigate its mode of invasion and its significance for successional development of the salt marsh.



# Your ODA

- Find the Stage 4 in your ODA.
  - Is it a statement of aim or a statement of main activity?
- Check if it is suitable for making a sentence template.
- Is there a Stage 5 (benefit or justification) in your ODA?

# Suggested process for drafting an introduction

- Begin with Stage 4
- Draft Stage 3 next – the ‘gap’
- Then think about how to begin Stage 1 – the setting (think about your audience)
- Next arrange the information you have collected from the literature into Stage 2
- Then, combine the stages and add any additional sentences needed to connect them into a coherent Introduction.

# Promoting 'flow': the writer's responsibility in English

Five techniques of skilled writers of English :

1. Always introduce
2. Move from general information to specific information
3. Put 'old' information before 'new' information in sentences
4. Make a link to preceding text within the first 7-9 words of a sentence
5. Try to include both the subject and the verb in the first 7-9 words.

# 1. Always Introduce!

- ‘A key to effective scientific communication in English is to set up expectations in your reader’s mind, and then meet these expectations as soon as possible.’ (Lindsay 1995)
- Use informative titles and subheadings
- Use introductory sentences or phrases
- In paragraphs, use the first sentence as a ‘topic sentence’ to foreshadow the main point the paragraph will make.

# Examples of effective topic sentences

- Pool fires provide a convenient, controlled means for studying the burning behaviour of a material.
- Litterfall and fine root growth in the forest under study are highly seasonal (Cavalier, 1992; Yavitt and Wright, 2001).
- Micronutrients such as iron are essential for bacteroid activity and nodule development.

## 2. Move from 'general' to 'specific'

Does this paragraph follow the guideline? Can you improve it?

Pleuropneumonia (APP) can present as a dramatic clinical disease or as a chronic, production limiting disease in pig herds. A sudden increase in the number of sick and coughing pigs and a sharp rise in mortalities among grower/finisher pigs may herald an outbreak of APP in a herd. On the other hand, signs may be limited to a drop in growth rate and an increase in grade two pleurisy lesions in slaughter pigs. The disease surfaced in the Australian pig population during the first half of the last decade and ten years on is regarded as one of the most costly and devastating diseases affecting the Australian pig industry. (Cargill, unpublished)

### 3. 'Old' information before 'new' (1)

Which example is easier to follow?

A: The five year plan does not indicate a clearly defined commitment to long-range environmental research. For instance, the development of techniques rather than the identification and definition of important long-range issues is the subject of the plan where it does address long-range research.

B: The five year plan does not indicate a clearly defined commitment to long-range environmental research. For example, where the plan does address long-range research, it discusses the development of techniques rather than the identification and definition of important long-range issues. (Olsen and Huckin, 1991, p. 440)

# Old and new information (2)



**Class exercise 25: Which sentence needs changing to follow the guideline?**

Pleuropneumonia (APP) surfaced in the Australian pig population during the first half of the last decade and ten years on is regarded as one of the most costly and devastating diseases affecting the Australian pig industry. It can present as a dramatic clinical disease or as a chronic, production limiting disease in pig herds. A sudden increase in the number of sick and coughing pigs and a sharp rise in mortalities among grower/ finisher pigs may herald an outbreak of APP in a herd. On the other hand, signs may be limited to a drop in growth rate and an increase in grade two pleurisy lesions in slaughter pigs.



# ‘Old’ and ‘new’ information (3)

- ‘Old’ information is anything the reader already knows
- Place ‘old’ information before ‘new’ in sentences to promote flow
- Class exercise: in the Desert Ecosystems introduction, underline the words that represent or refer to old information.

# Spatial Distribution of Litter and Microarthropods in a Chihuahuan Desert Ecosystem

<sup>1</sup>In most deserts of the world, transitions between topographic elements are abrupt and watercourses which are dry most of the time tend to dissipate their occasional waters within local basins. <sup>2</sup>Occasional torrential rainfall, characteristic of most desert regions, washes loose debris into watercourses or transports this material, depositing it in and along the shores of ephemeral lakes. <sup>3</sup>These physical processes result in a redistribution of dead plant material (litter), affect the distribution of soil water and create a heterogeneous biotic community. <sup>4</sup>Therefore, before the dynamics of desert ecosystems can be adequately understood, the spatial relationships must be clarified.

# 4. and 5: Important role of first 7-9 words



- Make link with previous sentence within this limit
- Try to include subject AND verb within this limit  
i.e. Always put a list at the end of a sentence

Class exercise: How could you improve the second sentence below?

The definition of seed quality is very broad and encompasses different components for different people. The quality and quantity of flour protein, dough mixing requirements and tolerance, dough handling properties and loaf volume potential are quality parameters of wheat seed for bread bakers.

# 'Rules of thumb' for first drafts

- Begin sentences with information that links to the sentences before.
- SUBJECT plus VERB plus OBJECT plus OTHER ELEMENTS – for first draft – reorganise for better flow later if necessary
- Try to keep sentences to one or two clauses only.

# Discussion

# Discussion Sections

- The Discussion relates to the Introduction
  - the aim/purpose statement
  - the evidence leading to the ‘gap’, and
  - the ‘Universe’ where the Introduction began
- It highlights the key points from the Results ‘story’
- Does your target journal allow a separate ‘Conclusion’? If not, use the last paragraph of the Discussion to conclude.

# Information elements to include

1. Some reference to the main hypothesis or purpose of the study, or the big picture issue, at the start – but brief
2. Re-statement of the most important findings, in order of importance
  1. whether they support the original hypothesis (if present)
  2. whether they agree with the findings of others
3. Possible explanations or speculations about the results
4. Limitations that restrict the generalisability of the findings
5. Implications of the study
6. Recommendations for further research or practical applications

# Discussions, cont.

- First 4-5 of these often repeated for each group of Results
- Concentrate on ‘take home messages’ (THMs)
- Use a subheading or a topic sentence to show where each THM begins
- Check for link between ‘take home’ message/s and paper title



# Sentence templates for Discussion

- This is consistent with earlier findings (ref).
- NP was much smaller, due in part to the NP.
- These results on NP compare favourably with earlier observations on NP using NP.
- NP did not explain the difference in NP.
- We suggest that the lack of NP is due to the absence of NP and not necessarily a result of NP, as has been previously hypothesised (refs).
- Our suggestion is supported by NP.
- The slightly lower NP may be attributed to NP as a result of NP.

# Writing a Discussion section

- For the last 4 information elements in particular, authors need to take special care with the *verbs* they use to discuss their results.
- The verbs carry much of the meaning about *attitude to findings* and *strength of claim*.

# Negotiating the strength of your claims

In sentences using *that*, authors have two opportunities to show how strong they want their claim to be:

- in the choice of vocabulary and tense in the main verb;
- in the choice of verb in the *that* clause.

# Negotiating strength

The results demonstrate that *GmDmt1;1*. is a symbiotically enhanced homologue of the Nramp family of divalent metal ion transporters presented here

It is more than that the occurred *in situ* on the likely hybridisation tussocks.

# Negotiating strength

It is very likely that the hybrid is less tolerant of reducing conditions than *S. perennis*.

These findings suggest that differences might to the observed  
in emergence contribute distribution of  
success adult plants.

Simulations demonstrated that higher survival would in a higher  
of *Trema* than result frequency of  
*Miconia* in high plots occupied  
light environments by *Trema* at  
22 weeks.

# Suggest alternatives to the underlined words: stronger or weaker claim?

that  
These suggest differences in might to the observed  
findings emergence contribute distribution  
success of adult plants.

# An alternative construction



The changes in surface elevation provide direct evidence of the mechanisms of salt marsh succession.

This study illustrates changes in species rank order of relative growth rates of leaf area across light environments.

We found no evidence for herbivory as a driving force in maintaining differences in habitat occupancy between species.

# Class exercise

- Rewrite Examples 2 & 3 using 'that' clauses and without changing the strength of the claim.

1. This study illustrates changes in species rank order of relative growth rates of leaf area across light environments.

This study illustrates that ...

2. We found no evidence for herbivory as a driving force in maintaining differences in habitat occupancy between species.

We found no evidence that ...



# Titles and Abstracts

# Thinking about titles: Part 1

- The first thing a reader reads
- Can be a Noun Phrase (NP) or a sentence
- Provide as much information as possible but be concise
- Avoid ambiguity in complex noun phrases

# The Title: examples describing the same work

Effects of nematodes on growth of mycorrhizal red clover

Fungivorous nematodes have differential effects on the symbioses formed by two species of mycorrhizal fungi with red clover

Fungivorous nematodes cause more damage to *Glomus coronatum* than to *Gigaspora margarita*

Fungivorous nematodes can be controlled by fenamiphos

Fenamiphos improves growth of mycorrhizal red clover by decreasing nematode attack on mycorrhizal fungi

...etc.

# Class exercise: Titles

- Your ODA:
  - Is the title a sentence or a noun phrase?
  - How many words are used?
  - What is the first idea in the title?
  - Why do you think the authors chose to put that idea first?

# Why are Abstracts so important?

- Often the only thing busy readers read
- May be all that is available to some readers
- Abstracting services may use it as a source of information for databases
- What about ‘additional keywords’?
  - Choose words your target audience might use to search under
  - Choose words not already in the title or abstract
  - Check if they are used in other papers in your field (or in the database index, if available)

# Abstracts: Typical information elements

B = some background information

P = the principal activity (or purpose) of the study and its  
scope

M = some information about the methodology used in  
the study

R = the most important results of the study

C = a statement of conclusion or recommendation

(Weissberg and Buker, 1990)

# Abstracts, cont.

This list can sometimes be compressed (in a so-called reduced abstract) to:

P + M = purpose and method of the study

R = results

C = conclusion (and recommendations)

# Class exercise: Abstract analysis

| Element             | Present in your ODA? |
|---------------------|----------------------|
| Background          |                      |
| Princ. Act/ Purpose |                      |
| Method              |                      |
| Results             |                      |
| Conclusion          |                      |



# Putting the pieces together

# A Manuscript Preparation Process

1. With co-authors, decide on
  - a ‘package’ of results
  - ‘take-home’ messages
  - target audience and journal
  - distributing the labour
  - authorship order
  - timelines

# Manuscript Preparation Process 2



2. Obtain Instructions to Contributors for the selected journal: set up an electronic template
3. Refine your tables and figures so they tell your results story clearly
4. Draft Results text and dot-points for the Discussion
5. Draft a title that captures the THM of the article
6. Draft Materials and Methods section

# Manuscript Preparation Process 3



7. Draft Introduction (Stages 4, 3, 1, 2 and 5)...
8. Draft Discussion (and Conclusion if present)
9. Draft Abstract
10. Combine all sections into complete first draft
11. Follow suggested Editing Procedures

# Editing Procedure: suggestions

- Put draft aside (48 hrs)
- Scan for overall 'story': is it clear?
- Read through (on paper!) and mark places needing attention – don't stop to fix things
- Then address the issues you marked
- Repeat from the beginning until satisfied with the science

# Editing Procedure: suggestions 2

- Edit for ‘discourse features’
  - Sub-headings
  - Topic sentences
  - General to particular order of information
  - Old information before new in sentences to enhance logical flow

# Editing Procedure: Suggestions 3

- Edit for grammar, spelling and punctuation
  - Your own common errors
  - Use a ruler from the bottom up
  - Watch for errors that Spellcheck misses
  - Consistent italics usage
  - All journal guidelines followed
  - Final proofread (self and then others)

# A strategy for beginning to write a paper

- We have worked with research students and scientists in research institutes in many places now
- This experience suggests that the four questions on the next slide are an effective place to begin the process of writing a paper



# Four questions to help create a 'story' from a set of results

1. What do my results say? (**dot-point summary of 'take-home' messages from the main tables and figures**)
2. What do they mean in their context? (**i.e. what conclusions can you draw from these results?**)
3. Who needs to know about these results? (**who are the audience for this paper you are going to write**)
4. Why do they need to know? (**what contribution will these results make to ongoing work in the field?**)

# How to use the answers to the four questions

Q1: Organise your Results section, including tables and figures, to highlight this answer.

Q2: Make sure your Discussion (and Abstract, if appropriate) highlight this answer.

Q3: Use this answer to make sure you choose the right journal to submit your article to, and to choose the starting point for your Introduction.

Q4: The answer to this question should help you decide what level of journal to target, and how to write the concluding sentences of the Discussion and Abstract

# Maximising your chances of success

# Referee's Report Form (generic example)



- Is the contribution new?
- Is the contribution significant?
- Is it suitable for publication in the Journal?
- Is the organization acceptable?
- Do the methods and the treatment of results conform to acceptable scientific standards
- Are all conclusions firmly based in the data presented?
- Are all illustrations required?
- Are all the figures and tables necessary and figure legends and table titles adequate?
- Do the title and abstract clearly indicate the content of the paper?
- Are the references up to date, complete and the journal titles correctly abbreviated?
- Is the paper Excellent, Good or Poor?

# Which manuscripts get published?



- Is the contribution new?
- Is the contribution significant?
- Is it suitable for publication in the Journal?
- Is the organization acceptable?
- Do the methods and the treatment of results conform to acceptable scientific standards
- Are all conclusions firmly based in the data presented?
- Are all illustrations required?
- Are all the figures and tables necessary and figure legends and table titles adequate?
- Do the title and abstract clearly indicate the content of the paper?
- Are the references up to date, complete and the journal titles correctly abbreviated?
- Is the paper Excellent, Good or Poor?

# Increasing your chance of getting your manuscript published?

- The contribution is new
- The contribution is significant
- The whole paper is excellent or good

# Increasing your chance of getting your manuscript published?



## **Is the contribution new?**

- **Read the most recent work in your field (including reviews)**
- **Check introductions for the ‘size’ of ‘gaps’**
- **Check discussions for suggested ‘future work’, limitations of previous studies and/or new topics**
- **Be realistic about how long the study + writing will take you**
- **Choose the right journal**

# Increasing your chance of getting your manuscript published?



## **Is the contribution significant?**

- **Check how much data is usually required for that type of study or journal**
- **Check introductions for the ‘size’ of ‘gaps’**
- **Check discussions for suggested ‘future work’, limitations of previous studies and/or new topics**
- **Think about the studies that might follow from your published research**



# Increasing your chance of getting your manuscript published?



**Is the whole paper excellent or good?**

- **Do not lose sight of the research while fixing the English**
- **Give your manuscript to a colleague to read. Ask them to list the questions they have about the research**
- **Be honest about the strengths & weaknesses of the research. Can you fill any gaps at this stage?**
- **Check the language, spelling, instructions to contributors etc.**

# Submitting a Manuscript

# The Editor's Role (*PART 1*)

The editor is responsible for maintaining the reputation and competitiveness of the journal.

The editor is responsible for the initial decision as to whether a submitted manuscript will be sent to reviewers.

Sometimes the editor returns the manuscript to the author at this stage.

Sometimes this may be because of problems with the English.

# What does the editor want to publish?

**Important** - significant and important research work

**Interesting** - appropriate and interesting work for readers of the journal

**Quality** - experimental and statistical methods are valid

**Meaningful** - literature review, discussion and conclusions are relevant and correctly interpreted

**Clear** - understandable and readable

**Presentable** - presentation undertaken with care (spelling, grammar etc.) and instructions to authors followed closely

# The contributor's covering letter 1

- State that the paper is in the field of the journal
- Emphasize that the paper is new & original
- Highlight specific points which may raise questions for the editor e.g.
  - Your belief that a longer paper is justified, not two short ones
  - Photographs are necessary rather than drawings
- Express hope that presentation is satisfactory
- Say you look forward to referees' comments

# Sample covering letter



Dear (Editor's name),

Would you please consider the enclosed manuscript, “*The effect of water content on solid-state  $^{13}\text{C}$  NMR quantitation and relaxation rates of soil organic matter*”, by (Submitter's name), for publication in European Journal of Soil Science. I have prepared the manuscript according to the instructions for authors and send it to you because it fits well within the scope of your journal. This paper has not been published previously elsewhere nor is it being considered by another journal. Included are three copies of the manuscript.

I look forward to hearing from you.

Yours sincerely,

(Submitter's name)

# What are referees asked to do?

- Manuscripts are commonly sent to two peer reviewers or referees
- Each journal has its own set of instructions for referees – sometimes these are available on the journal's website
- Check to see if this is the case for the journal you are targeting

# What are referees asked to do? (cont.)

- In addition to ‘ticking the boxes’, referees are asked to write their comments about any problems with the manuscript or any suggestions for improvement that need to be followed before the manuscript can be considered suitable for publication in the journal
- Referees return their comments to the editor



# Recommendation

- ☐ Accept without alteration
- ☐ Accept after minor revision
- ☐ Review again after major revision
- ☐ Reject

# The Editor's Role (*PART 2*)

The editor receives the reports from the referees and decides what response will be made to the author/s

If the first two referees disagree, sometimes the editor will send the manuscript to a third referee for an additional opinion

The editor then writes to the corresponding author, telling her/him of the decision

# Dealing with Referees' Comments

# Is the paper accepted or rejected?

- Accepted or accepted with minor revision
- Request for major revision and re-submission
- Rejected

# Paper accepted +/- minor revision

- Respond quickly
- Try to make all the changes
- Don't start any unnecessary arguments

# Who gets rejected?

- **Survey of scientists who had published at least 10 papers in 5 top ecology journals between 1990-1999\***
- **22% of papers eventually accepted had been rejected at least once**
- **Every author had at least one paper rejected**
- **Senior scientists & scientists with more publications had higher rejection rate**
- **EVERYONE**

# Why a paper might be rejected

- high ranking journals need to reject a high proportion of submitted manuscripts even if the reviews are (mostly) positive
- the paper may not fit the scope of the journal
- referees may not read or understand the paper thoroughly enough to appreciate it (remember: the review process is unpaid work for busy people)
- something may have annoyed the referee – they are unpredictable: can be helpful or (sometimes) rude
- the recommendations from the referee to the editor may be clear or unclear

# Paper rejected

Determine why the manuscript is rejected:

- Not suitable for the journal – submit to another journal
- Problems with design or method – try to publish the good parts
- Research not new or ‘important’ enough – submit to lower ranking journal
- If submitting the same manuscript, make changes recommended by reviewers



# Paper accepted with some revision: Rules of thumb

- **Rare that the referee is completely right and the author completely wrong**
- **Object is to accommodate the referee by addressing their comments without compromising the message of the paper**
- **Always show the editor you are doing the right thing – be polite**
- **Rejection does not automatically mean that the science is not good or that the paper is not well written**

## **Example: letter from *editor* to *author* after review**

**“Based on the comments and recommendations of the two reviewers (included) and my own reading of the manuscript, it is my view that some revision is required before this paper would be acceptable for publication. If you wish, you can send me a revised version of the manuscript, with a covering letter outlining how the reviewers’ comments have been addressed. I have also included an annotated copy of the manuscript with some corrections to grammatical, typographical and formatting errors. Please attend to these as well in the manuscript revision.”**

## Example: response from *author* to *editor* after revision

**“Please find enclosed a revised version of the manuscript, a letter outlining how the reviewers’ comments have been addressed and the annotated copy of the first version. Sorry for the delay, but some ... measurements were required... . The manuscript has been thoroughly revised in order to address the valuable suggestions of the editor and the two reviewers.”**

# Main types of comments from referees:

- 1. The aims of the study are not clear**
- 2. The theoretical premise or “school of thought” on which the work is based is challenged.**
- 3. The experimental design or analysis methods are challenged**
- 4. You are asked to supply additional data or information that would improve the paper**
- 5. You are asked to remove information or discussion**
- 6. The conclusions are considered incorrect, weak or too strong**
- 7. The referee has unspecific negative comments – eg. poorly designed / written / organised**

# Your final class task

- Please complete the Evaluation Questionnaires I will distribute now.
- I will use the results for two purposes:
  - To improve the course for future classes of Chinese PhD students in the early stage of their programs. We are still learning about your needs.
  - As data in our ongoing study of the effectiveness of inter-disciplinary, genre-based teaching in China.
- I value your honesty more than politeness!
  - Do not tell me what you think I want to hear – please tell me what you really think!
  - Ask for a translation if you are unsure of the meaning of any questionnaire items.

# Reference list



- Li, F., Zhao, S., & Geballe, G. T. (2000). Water use patterns and agronomic performance for some cropping systems with and without fallow crops in a semi-arid environment of northwest China. *Agriculture, Ecosystems and Environment*, 79, 129-142.
- Kaiser, B. N., Rawat, S. R., Yaeesh Siddiqi, M., Masle, J., & Glass, A. D. M. (2002). Functional Analysis of an Arabidopsis T-DNA “Knockout” of the High-Affinity NH<sub>4</sub> Transporter AtAMT1;1. *Plant Physiology*, 130, 1263–1275.
- Kaiser, B. N. (2003). The soybean NRAMP homologue, GmDMT1, is a symbiotic divalent metal transporter capable of ferrous iron transport. *The Plant Journal*, 35, 295-304.
- Lindsay, D. (1995). *A Guide to Scientific Writing* (Second ed.). Melbourne: Longman.
- Olsen, L. A., & Huckin, T. N. (1991). *Technical Writing and Professional Communication* ( Second Edition ed.). New York, USA: McGraw-Hill.
- Pechenik, J. A. (1993). *A Short Guide to Writing about Biology* ( 4 ed.). New York: Addison Wesley Longman.
- Sayer, E. J., Tanner, E. V. J., & Cheesman, A. W. (2006). Increased litterfall changes fine root distribution in a moist tropical forest. *Plant and Soil*, 28(1), 5-13.
- Weissberg, R., & Buker, S. (1990). *Writing Up Research: Experimental research report writing for students of English*. Englewood Cliffs, New Jersey, USA: Prentice Hall Regents