Writing Up Research

by016008

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Outline

- Syllabus
- General remarks
- Introduction
- Material and Methods
- Results
- Discussion
- Abstract
- Submission
- Handling reviewers
Syllabus

- Purposes
- Grading
- Schedule
- Textbook and references
Purposes

- The standard scientific paper
- Anglo-American style
- Academic editing
Grading

- Exercises, 40%
- Assignments, 30%
- Final exam, 30%
Schedule

Part I: The process of writing up research (12)
- General remarks (1)
- Experimental research report (0.5)
- Establishing a context (1)
- Reviewing previous research (0.5)
- Advancing to present research (0.5)
- Method (1.5)
- Material (1.5)
- Results (2)
- Discussion (2)
- Abstract (1)
- Acknowledgements and references (0.5)
Schedule, con't

- Part II: Practice with three research reports (3)
  - Forest ecology
  - Forest management
  - Silviculture
  - ...
- Find examples the course
  - Published papers in your areas of interest
  - Original research projects
General remarks

- General advice
- Methodology
- Article sections
Advice for modern academic writing

- The KISS rule: “Keep it Short and Simple”

- Clarity

- Readability

- Non-ambiguity

- Writers should aim “to inform, not to impress.”
Chinese versus Anglo-American Style

- The Anglo-American writer leads readers by the hand through the text.
- The Chinese writer, in contrast, expects the reader to find his own way.

Suggestions:
- Make the strategy of your text clear, not implicit.
- Refer immediately to all the main items involved.
- Make your main point clearly and early.
- Make the text talk about the text itself.
General advice for non-native writers

- Accept total responsibility for being clear.
- The greatest sin is ambiguity.
- Careful editing will shorten your texts.
- Never translate.
- Trust your ear.
Methodology I: process writing

- Write the first draft
  - Never translate.
  - Pour out your thoughts in the language of speech.
  - Write short, simple sentences in simple words.
  - Write “long”: Produce a 1,000-word text that will end as 600 words.
  - Use common verbs such as “to be / have / get / see / find out.”
  - Let yourself use the spoken forms “there is / are / was / were.”
  - Allow yourself passive voice
  - Avoid trying to organize your thoughts well.
Methodology I: process writing, con’t

In later drafts …

- Use your shortest sentences for your strongest statements. (“Everyone died.”)
- Cut out every word that performs no task.
  “There is / are X” => “X exists / occurs / appears / arises”
- Avoid synonym-collection as a way to avoid repetition. Choose and use one term.
- Replace most simple rough-draft verbs
  “to be / have /get” => “determine / detect / assess / confirm / evaluate / characterize”
Methodology I: process writing, con’t

- For elegance and formality
  - “get” => ”receive?” ”become?”
  - ”like” => ”such as”
  - ”big” => ”large / great”?
  - ”too” => ”also / as well”

- ”not” is weak.
  - Substitute negatives such as: ”no/nine/never”,
  - prefixes such as ”un- / in- / non-”,
  - or negative words: ”fail”, ”lack”, ”insufficient”.

- Convert most verbs from passive to active voice.
  - Avoid ending sentences with passives.
  - Change some passive verbs into adjectives
  - Change the verb itself
Methodology II: The passive vs. active voice

- The use of the active rather than the passive, could be encouraged
- Why not let the data speak? (with inanimate agents)
- In active voice, stronger and shorter

- 172 British secondary schools
  - 45% encouraged to use the active voice, 42% passive
  - 55 journals in the biological and physical sciences
    - Only two still required use of the passive

- Single authors should avoid “We”. They may sound like the Queen of England.
Methodology III: The end-focus technique

- Basic background information: who, where, when (how? why?) appear early
- The final position is the most important.

- Does the most vital word -- the “what” word -- a key adjective or substantive, end each clause and sentence => to lead, even to drag you into what comes next?
- Does the ending let you predict how the next sentence will begin?
Methodology III: the end-focus technique

- Such behavior is nowadays **unacceptable**. The police would arrest anyone who did this.
- Such behavior is unacceptable, **nowadays**. In 1700, however, cats suffered treatment we consider **cruel**.
  (Continue …)
- Nowadays, no one accepts such **behavior**. **Tormenting** animals is, in adults, at least, a symptom of a **psychiatric problem**. (Continue …)
- Unacceptable behavior nowadays includes mistreatment of **animals**. **Cats**, for example, used to be tormented for public **amusement**. Modern amusements are far more **gentle**. (Continue …)
Methodology III: the end-focus technique, con't

- It has been shown by previous research that an active role in the X-process is played by substance Y (Cao 1999), which was found in this study to be greatly increased in the infants with this disease. (36 words)

- Research has shown that, in infants with this disease, substance Y, which plays an active role in the X process (Cao 1999), greatly increased. (22 words)

- We found that substance Y, which in infants with this disease plays an active role in the X process (Cao 1999), increased greatly. (21 words)

- In infants with this disease, substance Y, which plays an active role in the X process (Cao 1999), increased greatly. (18 words!)
Article sections

- Introduction tells what question you will be asking
- Methods tell how it was studied
- Results tells what you found
- And
- Discussion explains what the findings mean

This produces the acronym **IMRAD**.
Article sections, con't

- **Abstract:**
  - why what was done was done,
  - what was done,
  - what was found,
  - what was concluded

- End the **Introduction** with what you are seeking

- Begin the **Discussion** with what you found
Introduction

- The experimental research report
- Stage I: Establishing a context
- Stage II: Reviewing previous research
- Stage III: A gap should be filled
- Stage IV: Purpose of your research
- Stage V: Possible value
The experimental research report

- Overview
- An example
- Formulating a research question
- Formulating a hypothesis
- Writing up your own research
Overview

- Controlled scientific experiment
- Correlational
- Survey questionnaires
- Computer-generated models
An example

- Page 3-11.
- Sections
- Headings
- Information in sections
- Compare with the general model
Research question and hypothesis

- Exercise 1.1: analysis, page 12
  - Research question
  - Hypothesis

- Exercise: library
  - SCI journals in forestry
  - Examine articles in terms of its general format
  - Research question and hypothesis
Writing up your own research

- By yourself, or with a group of classmates
- Select an area of interest
- Focus on one aspect of the area
- Write a research question
- Formulate a hypothesis
- Design the study
Introduction: establishing a context

- General -> Specific

- The five stages
  - I. the setting (Background, General->Specific)
  - II. already studied (Previous studies)
  - III. investigation needed (Gap)
  - IV. purpose (Your study)
  - V. value
Recipe for an Introduction

- Move 1: Establish the field: assert briefly how significant, relevant, and important is your chosen topic.

- Move 2: Summarize previous general research

- Move 3: Focus on your own research project: Indicate a gap in knowledge that should be filled

- Move 4: Introduce your own research: state the purpose of your research or outline what intended to do or what hypothesis you will test. This is the place for your research question.
Stage I: the setting

- Begin with accepted statements of fact related to your general area
- Within the general area, identify one subarea
- Indicate your topic

- Exercise 2.2, p. 25
- Exercise 2.14, writing up your own research
Stage I: the setting

- Begin with accepted statements of fact related to your general area
- Within the general area, identify one subarea
- Indicate your topic

- Exercise 2.14, writing up your own research
- Editing exercise
Introduction: stage I, con't

- Linking ideas through old and new information order
  - this..., such..., etc.

- General and specific noun phrases
  - article, a/an, the
  - uncountable/countable, singular/plural
  - criterion/criteria, phenomenon/phenomena,
    fungus/fungi, species, series
  - Never equipments, advices, informations
  - effect/impact, chapter/section, in print/in press
  - Fig. 2.3, p.32
Introduction: stage II

- Literature review
  - Citation style, p.42
  - Citation order
  - Tense
  - Exercise 3.13, p.63
Stage II: literature review, con't

- The present tense -\(\rightarrow\) fact
- The present perfect tense -\(\rightarrow\) several authors/the level of research activity
- The simple past tense -\(\rightarrow\) closely related
- Tense figures: p. 51-53,
- Exercise: p.50-51

- Accepted as fact -\(\rightarrow\) the present tense
- Results limited to one study -\(\rightarrow\) the past tense
- Tentative findings -\(\rightarrow\) modal auxiliary + verb
- Attitude and tense figures, p.55-56
- Exercise Exercise 3.8, p.58
Introduction: stage III

- Alternatives for stage III, p.67

- in adequate -> an important aspect ... has been ignored
- unresolved conflict -> theoretical or methodological disagreement
- an extension -> raises a new research question
Introduction: stages IV & V

- Stage IV, p.70
  - Report orientation
  - Research orientation
- Stage V
  - Often omitted, journal articles
  - thesis, dissertation, proposal
  - project reports
Introduction: summary

- Establish a research territory (I, II)
- Establish a niche for yourself (III)
- Occupy the niche (IV/IV,V)

- Exercise: put them together
  - Writing up your own research: Introduction section
Methods

- An overview
- Information elements
- Verb tense and voice
Methods: an overview

- Referees seem to focus half their criticism here
- This section must be brief
- Maintain the past tense
- Write long, and then cut, cut, cut out any wasted words
- Stay chronological. Report each step or event in a clear time-order, as events occurred.
- Answer all the questions the reader will be asking
- Do not end with passive verbs
- Hide them in the middle of the sentence
- Or substitute adjectives or nouns
- Avoid repeating words
Methods, con't

- Information elements included in method, p.92
  - Overview of the experiment
  - Population/sample
  - Location
  - Restrictions/limiting conditions
  - Sampling technique
  - Procedures
  - Materials
  - Variables
  - Statistical treatment
Exercises

- Exercise: p.93
- Exercise 5.3, p.95-96
- Verb tense, exercise, p.97
- Editing exercise
Convent most verbs from passive to active

- Avoid ending sentences with passives
- Move them from sentence-end to -middle
  To X, some Y was added. -> Y was added to X
- Chang some passive verbs into adj.
  X could be seen. -> X was evident/apparent/visible
  X was always used -> X was always useful
  Children were enrolled at age six. -> The children enrolled were aged six.
- Change the verb itself
  Patients (were operated ON) underwent sugery
  The (used) method (used/was used) served as a model
Passive -> Active, con't

- Omit useless passive constructions
  
  It has been found that X kills Y (Aho 2001)
  -> X kills Y (Aho 2001)

- Use inanimate agent (a non-human or non-living actor)
  
  Table 3 shows..., Figure 5 illustrates...
  Results indicate that..., The hypothesis predicts X.
  Opinions vary.
  These mice were given injections -> These mice received injections
Materials

- Information elements
- Verb tense and voice
Materials

Categories, p.114

- Laboratory equipment
- field equipment
- human or animal subjects
- natural substances
- fabricated materials
- surveys, questionnaires and tests
- computer models
- mathematical models
Ordering information

- Describing specially designed materials, p.116
- Step A, overview
- Step B, description of principal parts, p.118
  - spatial arrangement
  - functional arrangement
- Step C, functional description

- Exercise 6.4, p.122
Verb tense and voice

- samples: past tense, p124
- populations: present tense,
- conventional material: present tense, p.126
- specially designed or modified materials, past tense
- The passive voice is usually used when a human agent (the experimenter) is manipulating the materials, p.128
- The active voice is usually used when no human is directly responsible for manipulating the materials — i.e. when the materials operate "by themselves"
- The passive voice may be used to describe an action involving a nonhuman agent, but a phrase must be included to indicate the agent.
Results

- General advice
- Tables and Figures
- Information conventions
- Language conventions
General advice

- do not Double Document
- Results (the statistical significance), or Discussion (their practical significance)
- past tense, limit passive voice
- do not evaluate
- end the Results without any summary
- the Anglo-American Discussion now usually begins with a statement of your main findings.
Results or Discussion

- Of the 366 staff responding, 92 (25%) approved of the plan.
- The Whammo Method was effective in less than one-third of the groups.
- A four-fold increase in voting occurred in 1996 in districts with populations of less than 10,000; compared with the percentage of women voters aged over 50 in the same election three years previously, 1996 saw a rise in such voters of 56%.
- That only a quarter of the staff approved of the plan seems surprising.
- The Whammo Method's ineffectiveness may stem from its untested premises.
- Such a large increase in voter participation in rural areas--with so many older women voting--supports the suggestion of Smith (1999) that rural women of this age may take more interest in current events than do rural men.
Table Titles and Figure Legends

- Study the target journal's style
- Study many tables and figures in that particular journal
- Use full sentences?
- Use telegraphic style without unnecessary temporal verbs and articles?
- Drop initial "The"
- Explain all abbreviations in footnotes or in parentheses in title or column headings.
- Omit from a table title word-for-word headings immediately appearing in that table
- Avoid repeating the exact table title or figure legend in the text.
- It is efficient merely to give the table or figure number in parentheses.
Tables and Figures

- One table per 1000 words
- tall and narrow, lay out
- Avoid repetition of words, phrases, abbreviations, or figures
- Number all tables and figures in the order of their appearance in the text and be sure to mention each one, at least as "(Fig. 3 or Figs. 3-4)"
- define all terms and abbreviations
- be sure that multiple-part figures have clear numbers or letters
- Say "lines", "areas" in the legend, or put right on the figure
- in each table, be sure that each column is required
Information conventions

- Location of results
- Most important findings
- Comments

- Exercise 7.4, p.144
Language conventions

- Locating the figure, p.147
- Presenting the findings, p.148
- Commenting on the results, p.148-149

- Element 2: comparisons among groups, p.150
- Element 2: fluctuation of a variable over time, p.151
- Element 2: relationship between two or more variables, p.152
Discussion

- Discussions -- How to write them
- Recipe for a Discussion
- First information elements in discussion
- Later information elements in discussion
- Exercise 8.1
- Researcher's position on information towards the findings
- Complex sentence structure in discussion statements
- Verb tenses used in discussion statements
- Expressions indicating the researcher's position
Discussions -- How to Write Them

- Anglo-American writers
  - claim -- as the point of departure
  - give an explanation
  - restate their claim at the end
- The discussion answers the question "What do your findings mean?"
  - Show how your findings relate to existing knowledge.
  - Explain what is new in your work
  - and say why your results are important
  - what the next steps might be
  - other results and hypotheses that are relevant to yours
  - any possible errors or limitations
Recipe for a Discussion

- Main message.
  - This "answers the question posed in the Introduction"
  - includes the main supporting evidence
  - Next, critique your own study
- Critical assessment.
  - any shortcomings in study design, limitations in methods, flaws in analysis, or validity of assumptions
- Comparison with other studies
  - Your findings. Other studies' findings
- So what?
  - Conclusions, implications, further research
General advice

- Avoid priority claims
  - "This is the first report of ..."
  - "We are the first to do ..."

- To the best of our knowledge, this may be/ seems to be the first report of ...

- Avoid promising to publish more
Elements in discussion

- First information elements in discussion, p.162
  - A reference to the main purpose or hypothesis of the study
  - A review of the most important findings, whether or not they support the original hypothesis, and whether they agree with the findings of other researchers
  - Possible explanations for or speculations about the findings
  - Limitations of the study

- Later information elements in discussion
  - Implications of the study
  - Recommendations for future research and practical applications.
Discussions

- Researcher's position on information towards the findings
  - p.162. explanations, implications, limitations, or applications of the findings
- Complex sentence structure in discussion statements
  - p.168. Main clause (researcher's position) + that + noun clause
- Verb tenses used in discussion statements
  - p.170-172, by elements
- Expressions indicating the researcher's position, p.174-5
  - restating the hypothesis,
  - explaining findings
  - suggesting implications
Abstract

- General advice

- Abstract elements
General advice

- An abstract should reveal
  - why what was done was done
  - what was done
  - what was found
  - what was concluded
- An abstract must stand alone
- Each full term plus its abbreviation goes into the abstract.
- Always obey length restrictions.
  - 200 words, 150 unstructured, 250 structured
- Write the first draft as structured
All types of abstracts may include

- objectives or hypothesis tested
- study design and setting
- sample or subjects
- methods or intervention
- measurements, statistics
- results
- conclusions
- implications

- informative type of abstract
- indicative abstract (for conferences)
- review article abstract (commissioned by a journal)
Abstract

- Abstract elements
  - p.186. B(background), P(purpose), M(method), R(results), C(conclusion).
- Reducing the abstract
  - p.187. P+M, R, C*
- Abstract verb tense, p.192
Checklist

- Checklist for Abstract
- Checklist for Introduction
- Checklist for Materials
- Checklist for Methods
- Checklist for Results
- Checklist for Discussion
Checklist for Abstract

- p. 197
- Select and order information from previous sections of your report corresponding to elements B, P, M, R, and C.
- For reduced abstracts, eliminate B statements and combine statements containing P and M information.
Checklist for Introduction

- p.40. Stage I
- p.64. Stage II
  - Use a logical plan to order your citations
  - Use information prominent and weak author prominent citations at the beginning and at transitional points in Stage II
  - Use author prominent citations to report specific findings later in Stage II
- p.89. Stage III
  - Include all three stages in their proper order
  - Indicate a gap in the research in stage III
  - Choose research or report orientation for stage IV
  - Choose theoretical/applied perspective for Stage V
Checklist for Materials

- p.135
- Integrate the materials description with the procedural description
- Briefly identify conventional materials.
- Use three-step order for describing specially designed materials
- Choose spatial or functional arrangement when describing principal parts.
Checklist for Methods

- p.112
- Include all information necessary for someone to replicate your procedure
- Describe the procedure chronologically.
- Exercise, editing your own MM
Checklist for Results

- p.158
- Include three elements of information in presenting results, in either long or short format
- Write comments after each important finding, or put a general comment after the results.
- Write comments for various functions, depending on your findings.

- Exercise, integration, p.155
Checklist for Discussion

■ P. 183
■ Include various elements of information, depending on
  ■ the problems encountered,
  ■ results obtained,
  ■ possible applications,
  ■ and further research needed
■ Move from specific results to general implications.
Titles

- Should not be too general
- or too detailed

- Exercise, writing up your own research
- Biomass allocation, relative competitive ability and water use efficiency of two dominant species in semiarid Loess plateau under water stress
- Effect of cotton to various levels of nitrogen and water applied to normal and paired sown-cotton under drip irrigation in relation to check-basin
- Structure and application of biologic receptor chromatogram
Titles, con't

- Estimating forest carbon storage and carbon density at Huoditang forest region in Qinling Mountains
- A new species of Erysiphe from China
- Effect of human excreta mixture on biogas production
- Effects of different management measures on seedling regeneration of *Querus wutaishanica* in the Huanglong Mountain
- Vegetation coverage, species richness and dune stability in the southern Gurbantuggut Desert
Acknowledgements

- Acknowledgements require politeness as well as good English and can be risky.
- Saying "I acknowledge the aid of NN" sounds like merely a cold nod of the head.
- "NN serviced all my needs" sounds like master to servant.
- Avoid "I want to/wish to thank N," which seems to mean, "but I cannot; he ran away with my wife!"
- To avoid creating a dozen splendid phrases like "heartfelt thanks / deepest appreciation / I am deeply indebted to / I owe my sincere gratitude to / I warmly thank,"
- collect into groups the people you will thank. Use one gratitude phrase at the beginning of each group-paragraph, and then say why you are grateful to each.
Submission: target journal

- Study all authors’ instructions appearing in the target journal
- Follow these instructions exactly, checking them as you write, and then rechecking
- It is a grave mistake to submit a paper in the style of another journal. It has been rejected recently.
- A serious error that will disturb any editor is to ignore journal instructions and choose the wrong style for your references, say between Harvard and Vancouver.
- Including errors and flaws can harm your reputation as a serious writer, perhaps also as a serious scientist.
Submission: checklist

- E-mail address
- Full postal address
- Telephone and fax numbers
- Keywords
- All figure captions
- All tables (including title, description, footnotes)
- All equations (including notations)
- Spell-check and grammar-check
- References are in the correct format for the journal
- All references are double checked (Reference list, text)
Submission: cover letter

- NNPs vs. NPs
- NNPs wrote long letters (about 79 words each), whereas the NPs averaged only 33 words

NNPs
1. An appeal to the editor
2. About the article
3. About the writer
4. Reason for publication
5. Thanking the editor
6. Seeking a response
7. a positive response

NPs
Used by only 1 of 25 NPs

Favored by the NPs

Used by none of the NPs

Never used by NPs
Submission: cover letter

- All authors contributed substantially to this work
- This manuscript is not submitted elsewhere
- It duplicates no portions of other texts by the author(s)
- No financial support came from any source benefiting from these results
- The project follows accepted humane and ethical practices
- Mention any revision / editing by a native English-speaker
- Keep cover letter brief

- Always try to use your recipient’s name (not “Dear Editor / Madam”)
Sample professional cover letter

Please find enclosed a manuscript entitle “X,” reporting our / my latest / on-going / current / recent research into Y, for consideration by your journal. Its findings indicate that AA may be cause of BB.

The material presented is based on the original research of the author(s) and is not being offered for publication elsewhere.

Correspondence regarding this article should be directed to NN. We / I look forward to hearing from you.
Submission: cover letter, con’t

- Second-submission cover letter

Thank you for considering / taking into consideration our paper / article, entitled “X in Y.” We have made, to the best of our ability, the / all the revisions suggested, and these are outlined / explained point by point on the attached pages / in the accompanying file.”

This version has been revised by a native English speaker. We hope that you will find this version more acceptable. Looking forward to / Awaiting your reply / response.”
Handling reviewers / referees and editors

- Extremely rarely is any manuscript accepted without changes
- The most valuable thing you can ever receive is fair and honest criticism
- Seek criticism, invite it, welcome it
- NNPs may have a struggle with referees’ language
Handling reviewers, con’t

- A list of reviewers’ colloquial terms:
  1. Check, go through, put more simple, tidy up, reword, have another look
  
  2. Drop, leave out, weed out, scrap, cut down, tighten (up) versus give more weight to, emphasize; you forgot to mention
  
  3. Correct accordingly / in accordance with / according to; mistaken, missed the point, should’ve checked, make clearer, you meant to say …
Handling reviewers, con’t

- Check before submission
  - The appropriateness of your title
  - The clarity of your abstract and figures
  - The originality, relevance, and usefulness of your findings

- Are there any ambiguities, and errors in statistics, facts, or logic?
- Is there any unjustified speculation?

- Reply directly to the editor and quote the reviewers’ criticisms in full or briefly.
Handling reviewers, con’t

- Act on every comment of fully explain why you cannot
- Always be polite to the editor and polite regarding your reviewers
- Be as objective and formal as you were in your manuscript

Sample phrases:
“As advised / suggested / pointed out, I have reworded / added / deleted / corrected X”
References

'Of the great teachers, when they are gone, their students will say: we did it ourselves' - Dorf