SCIENTIFIC & ACADEMIC

WRITING IN ENGLISH

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FOREWORD

Writing represents one of the most important yet most underdeveloped and neglected skills scholars and academics need to attain success in their careers. Writing also requires immense effort and dedication.

From thesis and dissertation writing, to manuscript development for peer-reviewed publication and the dissemination of results, to grant and research funding applications, academics must learn to write clearly and solidly for a multitude of audiences. They must also invest the time needed to produce solid manuscripts.

This course book serves as a guide on how to write effectively, clearly and for academic purposes and supports the course Scientific (or Academic) Writing in English. Originally developed by University of Helsinki legend Carol Norris, and refined by Roy Siddall and now myself, it focuses on various elements of writing and style specially in English which form the foundation of solid scholarly writing. This book and course were specifically designed to help Finnish or Finland-based scholars and graduate students.

Whilst there are many style guides for those writing in English and, indeed, many different styles, this course book and course focus on the key mechanics common to writing in general.

Should you find any errors or inconsistencies within, please do let me know.

Happy Writing!

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ADVICE FOR MODERN ACADEMIC WRITING

In some fields, young scholars may imitate the often out-dated style of their professors or of journal articles published many years ago. Currently, style is evolving because of widening democracy and internationalisation, as well as increased printing costs.

The KISS Rule, 'Keep it Short and Simple,' and less politely **'Keep it Simple, Stupid!',** should remain at the forefront when writing.

At a conference of the **Association of European Science Editors (EASE)**, the editor of the *British Medical Journal* demanded:

clarity
readability
non-ambiguity

He also wanted articles to be as short as possible. Rather than 'Count every word,' we should '**make every word count.'** Remove every useless or extra word.

Teacher-editor-author Ed Hull wants 'reader friendly' scientific writing. To achieve this, he says, authors must realise that they are no longer in school; teachers demand performances greatly different from texts meant to inform busy readers wanting 'nuggets' of precious information.

Similarly, in the EASE Bulletin *European Science Editing* (1998:7–9), Frances Luttikhuizen criticised the 'exaggerated use of the passive voice and Latin-based words … [that] belongs to the formal style of the 17th century. It weakens scientific writing. The active voice is much more forceful than the passive…. For linguistic as well as cultural reasons, scientists who have English as a second language … tend to feel more comfortable writing in a more formal style.' Her ageless advice continues, '**Readers of scientific papers do not read them to assess them, they read them to learn from them... . What is needed is more simplicity, not more sophistication**!'

Aim 'to inform, not to impress.' (Emphasis added.)

GENERAL ADVICE FOR NON-NATIVE WRITERS

Never translate. Of course you can use your own language to take notes and write outlines. But word-for-word translation into English means that anyone's mother tongue causes interference. This will damage the grammar of your English and your vocabulary, punctuation, and everything else. Some non-native English speakers can rapidly write letters and stories in correct, charming English, but when they write a text first in their native language and then translate it, the result is awkward, unclear, and full of errors.

Accept total responsibility for being clear. If an intelligent reader has to re-read any sentence to understand it, the Anglo-American attitude is not to blame the reader, but to blame the writer. This may contrast with the direction of blame in your own culture, but think: Who has the time to re-read sentences? Bad idea!

The worst sin is ambiguity. Being ambiguous means accidentally expressing more than one meaning at one time, as in: *'*Women like chocolate more than men.*'* Does this mean that, given the choice between a nice Fazer chocolate bar and a man, a woman will prefer the chocolate? Or do you mean that *'*Women like chocolate more than men **like chocolate***'*? Let's hope, for the survival of humanity, that it's the latter!

Careful editing will **shorten your texts, making them more publishable.** One writer wisely said, 'If I had had more time, I would have written you a shorter letter.'

Trust your ear. English grammar rules are many, with multiple exceptions. At your language level, in this country, depend instead on what you have **heard in English, particularly regarding idioms.**

Your ear will tell you when an **odd**-**looking phrase sounds right**. My long experience shows that non-native English speakers' TV- and travel-trained ears are trustworthy. **Read all your written texts aloud to yourself**.

English is not logical. The most **logical choice of words is often not what a native speaker would say**. (Which is logical*: 'hang up,' 'ring off,'* or *'close the phone?'* How about *'For the 20 last years'* versus *'for the last 20 years'*?) In English, the most nearly logical system is punctuation, but even punctuation differs considerably from Finnish punctuation.

FINNISH VERSUS ANGLO-AMERICAN ACADEMIC WRITING

Finnish writers tend to perceive the reader differently to Anglo-American writers, leading to notable differences in style. Finns seeking to publish in English in international journals with an Anglo-American cultural bias, therefore, need to be aware of these differences:

Finns, from a homogeneous and well-educated society, may tend to view their readers as informed colleagues willing to expend effort in order to understand the text. The Anglo-American writer may seem to be 'packaging' or even 'marketing' the text, making its contents maximally accessible to readers who are too busy and who may lack background knowledge.

The Anglo-American writer leads readers by the hand through the text, whereas the Finnish writer doesn't interfere with the reader, but expects the reader to find his own way. The Finn avoids offending the reader by trying to be totally clear; that may seem patronising. Whereas the Anglo-American writer plays the role of a teacher or a strict guide, the Finn acts more like a guru… or a poet.

The following suggestions should be noted when writing articles in English:

- **Make the strategy of your text clear, not implicit.** Present your important points first in the text; do not gradually 'sneak up on them' or present them late, almost as a surprise. Let your reader know ***immediately*** what is going on.

- **Refer immediately to all the main items involved.** These will probably be your 'key words', and most or all may appear in your title. Then, in referring to previously mentioned items by referents such as 'this/these/such', offer more information than just the pronoun (e.g. 'this' becomes 'this investigation').

- **Make your important points clearly and early.** Do not make the reader wander through large quantities of background material. Orient the reader in advance towards the question you wish to answer in the text, and present the answer as early as possible; do not construct the text or any section the way a novelist constructs a mystery story.

- **Make the text talk about the text itself,** not only with 'First… second… third…' but with other types of sign-post language such as: 'Moving on to consider X…', 'As mentioned above…'.

BASIC METHODOLOGY I: PROCESS WRITING

Write the first draft in English

- **Never translate** whole sentences from your mother tongue.
- **Avoid trying to organise your points as yet.** Rather, get your ideas out onto the page first.
- **Pour out** your thoughts in **English** in the language of **speech**.
- Write in many **short, simple sentences.**
- **Refer immediately** to the **main items** involved; use signposts.
- **Write** '**long**': produce a 1,000-word text that will end as 600 words.
- **Allow** yourself to use the **passive voice** (see section on passives).
- Let yourself **use** the **spoken forms** *'*there is / are / was / were*.'*
- **Use simple verbs** such as *'*to be / have / get / see / find out*.'*

Edit, edit, and edit again

The process of editing and revising can theoretically go on infinitely. But, revising is also much easier than putting down your thoughts for the first time. Once you produce a solid first draft, you must revise and edit until you (and your colleagues / supervisor) are pleased with what you have said and how you have said it. You should also revise to mirror the stylistic preferences and guidelines for the publication to which you are submitting.

As you revise, focus on the following:

- Use precise and specific language throughout.

- Replace general **VERBS** with more **PRECISE VERBS** (e.g., determine, detect, assess, confirm, exemplify, evaluate, characterise).

- For more **FORMALITY**, specify meanings of *get* (*receive*? *become*?), change *if* to *whether*, and *like* to *such as*. *A lot/lots/plenty of* are too colloquial. Strengthen *very* and *nice*.

- *NOT* is weaker than structures with *no*, *none*, *never*, and *un-/in-/im-* forms. (Change 'X did not work' to 'X failed to succeed' and 'This was not possible' to 'This was impossible.')

- Avoid series of short, choppy sentences: link some and embed others within their neighbours (e.g. The plants were weighed. The biomass was then determined. → The plants were weighed and the biomass determined).

- Use short sentences for your strongest statements. ('Everyone died.')

- Eliminate wordiness.

- Consider converting **PASSIVE** to **ACTIVE VOICE**.

- Improve cohesion gradually through **END-FOCUS**.

Each of these processes is illustrated in the examples that follow which focus on improving the language and style of English-language manuscripts.

Precision helps improve clarity. When referring to previously mentioned items with 'this / these / such,' offer more than just the pronoun:

Ambiguous		Specific
This … **These …** **It …**	becomes →	**This model …** **These patterns …** **Such a programme…**

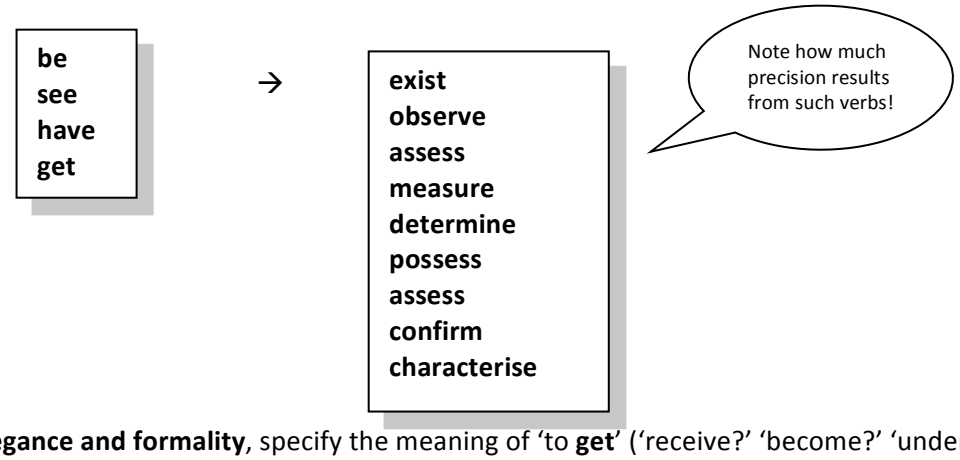
You can often save words by adding data: *'*This extremely effective model / programme.*'*

English loves **signposts**, or connectives, because they tell readers how to receive new information. Use not only *'*First … second … third…,*'* but other types of signposts:

*'*On the other hand…' → *'*Considering this from another angle…*'*

*'*Similar to the last point, we find… *'*

Upgrade rough-draft common verbs to more **precise, action-oriented verbs** (see verb pages):



For **elegance and formality**, specify the meaning of 'to **get**' ('receive?' 'become?' 'understand?).

Avoid colloquial expressions opting for more formal phrases (see verb pages):

Colloquial		Formal
if **like** **a lot of, lots of, plenty** **big**	→	**whether (or not)** **such as** **many, several** **large, great**

Never omit 'such*'* with *'*as.*'* ('Species ~~*as*~~ *such as Australopithecus*... *'*)

Beware of the vague *'*so.*'* *So* (thus?) X occurred?' 'It was *so* fast.' (How fast?)

Avoid *'*too,*'* especially at the end of a sentence.

He died, *too*.	→	**He, *too*, died.** **He died, *as well*.** **He *also* died.**

Similarly, how hot is *'*too hot?*'*

Strengthen negatives:
*'***Not'** is so common **in speech** that it **frequently loses a letter**, becoming a contraction such as 'can't / don't / wouldn't.' It is doubly contracted in 'dunno' when substituted for 'I don't know.' In scholarly writing, we generally avoid using negating contractions altogether.

When writing, 'not' is always a weak word. Eliminate the word 'not' from your first draft in three ways:

- **Substitute negatives,**
- **Substitute negative prefixes, or**
- **Use negative verbs or negative adjectives**

Strong negatives	Weak	Stronger
no **none** **never**	**There was *not any* X.** ***Not one* patient survived.** **They had *not seen* X before.**	***No* X *existed* / appeared.** ***None* of the patients survived.** ***Never* had they seen X before.**

(Note: Beginning a sentence with a negative is powerful.)

Strong prefixes	Weak	Stronger
un- **in-** **im-** **non-** **dis-**	**The cause is *not* known.** **The text was *not* coherent.** **The task was *not* possible.** **Results were *not* significant.** **This drug is*n't* made anymore.**	**The cause is / remains *un*known.** **The text was *in*coherent.** **The task was *im*possible.** **Results were *non*-significant.** **This drug has been *dis*continued.**

Negative verbs / adjectives	Weak	Stronger
fail **lack** **absent** **insufficient** **incomplete**	**The plan did *not* work.** **The solution did*n't* have X.** **X was *not* in the samples.** **Controls did*n't* have *enough* X.** **The test was *not finished*.**	**The plan *failed* (to succeed).** **The solution *lacked* X.** **In the samples, X was *absent*.** **Controls had *insufficient* X.** **The test was *incomplete*.**

Note: In these examples, you want to specify X.

Varying sentence length helps create flow and rhythm within texts. In first drafts, sentences tend to be uniform in terms of length. What we consider 'good' writing generally relies on sentences of varying lengths. That is, some sentences are short; others are not. This helps to eliminate 'choppiness' in texts. Address choppiness by linking some sentences and embedding others within their neighbours.

Short & choppy

X costs a lot. You can't get it there often.

→

Elegant (linked & embedded)

X is expensive and is seldom available there.
or ***Because* X is expensive, it is seldom available there.**

Situation → Result = end-focus
X, being expensive there, is *seldom available*.

Use the **shortest sentences** for the **strongest statements** *(e.g., '***Every mouse died***.')*

Cut every extra word that performs no task.

There is / are X.

X exists.
X occurs.
X appears.
X arises.
X emerges.

Note: All are **Active Voice**

Avoid repeating facts. Planned repetition of words helps linkage. Confusion results from synonym use. Be clear by choosing **one term**. Do not indulge in the overuse of a thesaurus. For instance, **'Method / methodology / procedure / system'** must never refer to the same thing. As readers, **we assume that they mean four different things**.

One paper described a group of infants with these six labels: 'neonates / newborns / infants / babies / patients / subjects.' We would view these as six groups. Instead, choose two terms such as 'neonates' or 'infants' and then use 'They / These' and other pronouns to refer to them.

Convert most verbs from passive to active voice. Avoid ending sentences with passive verbs. For good writing, this is the kiss of death. Replace them with active verbs. In Methods, passives can appear in the middle of the sentence:

To X, Y *was added*.

Y *was added* to X.

Change some **passive verbs into adjectives**:

Passive verb	Adjective
X could be seen. ***X was always used.*** **All two-year-old children *were studied*.**	**X *was* evident/apparent/visible.** **X always *proved* useful.** **All children *studied were* age two.**

Note the end-focus used in each.

Change the verb itself:

Samples *were collected*.
Sixty *were used* as controls.
Each sample *was treated with* X.

We *collected samples*.
Sixty *served as* controls.
We treated samples using X.

Omit useless passive constructions:

It *has been found* that X causes Y (Aho 2001).

We found that Y w*as produced* by X.

Aho (2001) *found* that X causes Y.
X *causes* Y (Aho 2001).

Y *results from* X. X *leads to* Y.
X *produced* Y. Y *was* a product of X.

The citation here shows who (Aho) found X. Journals tire of these useless 'found' phrases. In discussing your own findings, avoid using 'found' even when using the active voice (e.g., ***'We found that X produced Y.'***) Simply write '**X produced Y.**' The past tense shows that this is your finding. Present tense is for others' generalisations: '**X produces Y'** (see below on verb tense).

Use the **inanimate agent,** a non-human / non-living thing performing an action.

Table 3 *shows* …
Figure 5 *illustrates* …
Our results *indicate* …
Our hypothesis *predicts* X.
Opinions among us *vary*.

Note: All in **Active Voice**

Your final step in revising is to check to the **grammar**, specifically whether each verb agrees with its subject in number.

1. **Locate every verb** (good sentences have only one or two.)

2. **Scan to the left to find its subject** (often located far away).

Read this too-complex and difficult practice sentence with its **five substantives** in **bold.**

Which one is the subject of the verb?

'The actual **reason** for these **changes** in **policy** that seem to alter the newest reorganisation **plans** for these **regulations is/are** surprising.'

Exercise #1

Read through the following sentences with widely separated subject (agent) and verb. Mark the agent; find the subject (agent) and the verb that shows its action. Revise and reorganise these sentences so that the subject and agent are closer together, and information comes in a more logical, clearer order. Note the words in italics.

Examples adapted from Duke University, *Scientific Writing Resource*, 2013

1. **Eggs, nuts, shrimp, mushrooms, milk and other foods containing lactose, and some species of tree and grass pollen *are* often *found to act as* allergens**. (25 words)

2. **The possibility that some termini have a base composition different from that of DNA simply because they *are* the nearest neighbours of termini specifically *recognised* by the enzymes *can be checked* by comparing the experimental results with those that *are expected* from the nearest neighbour data. (**46 words)

3. **Mapping of open chromatin regions, post-translational histone modification, and DNA methylation across a whole genome is now *shown to be* feasible, and by RNA sequencing, new non-coding RNAs *can be* sensitively *identified***. (32 words)

BASIC METHODOLOGY II: PASSIVE VS. ACTIVE VOICE

In sentences written in the **active voice** the **subject** performs the **action** expressed in the **verb**:

- Smith (2006) has recently reviewed the literature on this topic.

In **passive** sentences the **subject** of the sentence is **acted upon** by some other agent or by something unnamed:

- The literature on this topic has recently been reviewed by Smith (2006).
- The literature on this topic has recently been reviewed (Smith 2006).

The passive voice is commonly used in scientific or technical writing where the actor is of less importance than the process being described.

- The data can be analysed in various ways.

It also allows the writer to avoid personal pronouns or the names of particular researchers as subjects of sentences, thereby creating a sense of objectivity.

- I estimated the size of the population → The size of the population was estimated.
- This problem has been overlooked. (no agent)

However, overuse of the passive can create rather awkward and dull text that quickly loses the interest of the reader. Changing to the active voice can improve clarity, conciseness and directness of the text.

Active and passive—like major (*duuri*) and minor (*molli*) keys in music—are the **two types of voice. Tenses,** unrelated to voice indicate **time**.

Note the **difference between tenses**—present, past, and perfect—**and voice.** The English passive always includes two to four verbs and allows the addition of '**by**' someone or something.

• **Present tense, active voice**: 'he finds.'	**Passive**: 'it is found' (by X)
• **Past tense, active**: 'he found.'	**Passive**: 'it was found' (by X)
• **Present perfect, active**: 'she has found.'	**Passive**: 'it has been found' (by X)
• **Past perfect, active**: 'she had found.'	**Passive**: 'it had been found' (by X)

Even a **future passive** is possible—though horrible: 'The test will have been given'!

As recently as 1997, Paul Leedy insisted, in his book *Practical Research, Planning and Design*, that 'the researcher … should be anonymous. The use of the first-person pronoun or reference to the researcher in any other way is particularly taboo…. **All of the action within the drama of research revolves around the data; they, and they only, speak**.' (Emphasis mine, throughout.)

My response: Then, why not let the data speak? Here, Leedy himself elegantly states that 'the action … revolves.' In the active voice! He also has 'data … speak' in the active voice. These are fine inanimate agents — non-living causes of actions. If such agents serve as subjects, we have no need for personal pronouns like 'I' or 'we.'

Leedy continues, '**The passive voice … is used to indicate** [**Why not 'the passive voice indicates'?**] that no identifiable subject is performing the act. It is a kind of ghostly form of the verb that causes events to happen without any visible cause being present.' Then, 'Note the **passive** voice construction in this sentence: "**A survey was made of the owners of the Rollaway automobiles**" or

"**The researcher made a survey of the owners of Rollaway automobiles**." … Here we have [an] … intrusion of the researcher. …[T]he best research reporting does not use it.'

Again, instead of the passive verb or 'the researcher made,' why not 'A survey of the owners … showed that ….'? All surveys producing results have already been 'made.'

In the active, this is both shorter and stronger.

He adds that passive voice verbs can even 'suggest events … in the future without any indication of who will do them by using the **future passive** form of the verb … "The test *will have been given* before the students *are permitted to read* the novel."' These two passives consume eight words.

Because all tests, once finished, 'have been given,' why not: 'After the test / after taking the test, the students will / can then read / will be able to read the novel'? The result: active voice and short.

Do you fear that journals may reject papers written mostly or entirely in the active voice?

Nature Medicine, years ago, published its Methods all in **active voice.** This is rarely possible to maintain throughout Methods, but their authors freely used 'We, we, we' in sentences such as:

'We processed the samples. Then we rinsed the residue in a solution of ….'

Here are additional empirical data (NB: The word 'data' is plural.)

Back in 2001, biologist Rupert Sheldrake queried **55 journals in the biological and physical sciences. Only two still required use of the passive** voice. 'Most scientific journals accept papers in the active voice,' he said, 'and some … positively encourage it.' (*New Scientist*, 21 July 2001)

The British Medical Journal's 'House Style' (http://www.bmj.com/about-bmj/resources-authors/house-style) has demanded for several years that authors:

'**Write in the active and use the first person where necessary**.'

Even in active voice, however, 'I/We' first-person pronouns are usually unnecessary. (Interestingly, 'our' seems acceptable, even when the author avoids 'we.) The valuable inanimate agent allows you to avoid these pronouns for active voice.

The *mice* each *received / ingested* 20 mg daily. (non-human agent)
The *reason* for X *remains* unclear.
***Results indicate* that our hypothesis is correct.**
The *evidence suggests* an alternative cause.
All *data came* from X. (We know they did not walk there using their own feet.)
Our *laboratory provided* urine samples.

Save passive verbs for times when they do, in fact, prove essential, merciful, or comical.

In one death notice, 'Some of us *will greatly miss* Professor Aho.' This, however, implies that some may be pleased at this death. Avoid sending this sentence to his/her widow/widower.

Instead, '(The late) Professor Aho *will be missed*.' ('Late' is a polite adjective for deceased.)

To be gentle:
'You're fired / sacked' becomes 'Your candidacy / position *is revoked /eliminated*.'
Similarly gentle, 'Your breast *must be removed*.' 'Your results will arrive after tests *are run*.'

To maintain anonymity: 'The suggestion *was made* today that nurses should go on strike.'

Comedy: 'When my great-grandmother status *is achieved*, greater respect *will be required*.'

Exercise #2

Can you convert these sentences to the passive voice?

A. The leaders are seeking a fair resolution to the crisis →

B. Scientists have discovered traces of ice on the surface of Mars →

C. One third of students failed the exam →

Can you convert these sentences to the active voice?

1. The book is being read by most of the class →

2. Results will be published in the next issue of the journal →

3. An experimental heart operation was successfully performed yesterday →

BASIC METHODOLOGY III: THE END-FOCUS TECHNIQUE

End-focus improves logic, clarity (*selvyys*), flow (*sujuvuus*), and cohesion (*tiivistys),* elements necessary for writing well*.*

The result may be catastrophic, as shown by our study.

Rewrite the boxed sentence twice. First, put the new information—the **what**—last. In the next draft, revise to use the active voice making use of the **inanimate agent.**

Only one word in this sentence is important—only one provides new information.

Every sentence should present its basic **background information first,** which we can label the **who, where, when (how, why?**). These data orient (British 'orientate') the reader**.**

- The beginning of a sentence—regardless of what some teach—is only the second most important location. Most important is the end. Here we find the 'what' or new information.

- Find the most vital word or two**,** the 'what'—a key adjective or substantive or a numerical value that you have discovered. Place it at the end of its clause / sentence.

- Be sure that each sentence ends with words that lead, even drag, you into what comes next. This creates intra-sentence linkage, allowing readers to predict what the next sentence will say.

Remember: Focus and Link

Writing a first draft with end focus as well as with sentence-to-sentence linkage is, however, almost impossible. Instead, first get the words onto paper; then move words and phrases around.

Start all of your writing with a fast, disorganised rough draft, because such 'bad' texts are the easiest to improve by means of passive-to-active voice changes, end focus, and linkage**.**

- Find the **most vital, novel word** in the sentence, the one revealing the newest information.
- After this word, put a **period (full-stop).**
- **Move** all the words following this end focus word to the left**.** Often the best place to insert words is after a 'that' or 'which,' as below:

She does fine work **that** may win her a Nobel Prize *within a few years*. → She does fine work that, within a few years, may earn her a *Nobel Prize*.

Observe my struggle with a rough draft totalling 28 words, with four passive-voice verbs (in italics) and no end focus. I assume that we have already heard about drug X, so X offers no excitement.

Nothing *was known* about what happens to children who *are given* drug X. It *was found* that adults often have diarrhoea if they *are given / administered* drug X. (3).

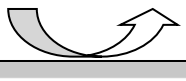
I first edited this by removing useless, wasted words and changing to the active voice and end focusing. The active voice required three inanimate agents: 'effect,' 'evidence,' and 'X.' For clarity, these sentences also needed 'however' or 'whereas,' but not in the vital first position.

(The *BMJ* and I both avoid wasting the first-word position on 'however' or 'therefore.' These words become stronger as they move to the right, with maximum power when 'however' serves as the end focus. Remember, it travels carrying two suitcase-like commas!)

The effect of drug X in children is *unknown*. In *adults*, however, evidence indicates that X frequently leads to *diarrhoea*. (20 words)

A clever student then noticed that these sentences lacked linkage; the first sentence failed to flow into the second. I therefore sacrificed the best end focus in the first sentence ('unknown') and instead gave focus to my second choice ('children'). Note the solid linkage with only 17 words.

The effect of drug X is unknown in *children*. In *adults*, however, X frequently leads to *diarrhoea* (3).



Another student then noticed that I was violating a major rule—to observe **strict chronology**. Always describe events in **chronological order—**the order in which they occur or the order in which we learned about them. Now all of these data fit into one 14-word sentence.

X frequently leads to diarrhoea *in adults* (3), whereas *in children*, its effect remains *unknown*.

X frequently leads to diarrhoea *in adults* (3); in *children*, however, its effect remains *unknown.*

Exercise #3.A

In the examples below (A to D), the first and second sentences illustrate end focus with linkage (both italicised). Choose, from among sentences 1 to 5, the best-linking third sentence for each:

1. Finland has the world's highest incidence of type 1 *diabetes. This disabling disease* and its treatment constitute a drain on *national medical resources*.

2. The world's highest incidence of type 1 diabetes occurs *in Finland. Finnish* diabetes researchers now discover some of the field's most *interesting new data*.

3. Regarding type 1 diabetes, Finland's annual incidence is the world's *highest. Its figure* for 2008 was *60/100,000*.

4. Finland has the highest incidence of type 1 diabetes in the world. At least one *nation's* mean incidence in 2008 was under 1/100 000, which means that Finland's was 60 times as great, though no one knows why.

Continue sentences A to D using one of the following sentences (1 to 5).

1. An important area of investigation is diabetes-associated *nephritis*.

2. Is sugar consumption unusually high, or is this rate mainly related to *genetics*?

3. Finland must continue to battle this key medical problem, despite *research costs*.

4. The state finances medical care and financially supports those *unable to work*.

5. Such a figure requires funding of the country's *top researchers*.

Exercise #3.B

Look at this example:

It is estimated that in Finland the number of new cases of XXX cattle disease will increase two-fold during the time period 2015-2020, among both male and female individuals, according to Aho (2014).

How could you move this information around so that the basic background information appears early in the sentence and the newest findings and most important information comes last, leading you on to the next sentence? After you have written your first draft of a piece of writing, practice moving words around to improve the end focus.

Now, look at this sentence:

Finland, which sees itself as a 'small' country, is in the far north and has some five million citizens who speak a non-Indo-European language and enjoy going to the sauna, as most guide books will tell you.

Without removing any of the information in it, can you create five different versions, each of which will lead into one of the five sentences below?

1. Polar bears do NOT, however, walk the streets of Helsinki.
2. For this reason, adult English-speaking foreigners rarely become fluent in Finnish.
3. The only well-known Finnish word, in fact, is "sauna."
4. Italy is approximately the same geographical size.
5. Unlike many countries of the world, its population is decreasing.

Exercise #4: Basic Methodology

This text is intentionally silly, so concentrate only on its language. Applying the basic methodologies we've discussed thus far, revise this to shrink it to as short of a text as you can. It now includes **ten verbs in the passive voice** italicised**. It mainly needs savage shrinkage!**

- First, locate and repair **four errors** frequent among Finnish writers.
- Then **reduce its length from 114 words;** aim at a **third** of its present length**.**
- **Choose active-voice verbs**.
- Try to **create some end-focus and linkage**.
- **Freely omit, alter, or rearrange words.** Each of you will edit this differently.
- Finally, **COUNT every word in your version**.

The effectiveness against narcolepsy of caffeine *was tested* on humans by our group. It was effective, as *was* previously *shown* by Smith (Smith 2006) when mice, that *were found* to be narcoleptic, *were given* caffeine when they demonstrated signs of narcolepsy. Therefore, an experiment *was carried out* by our group. We had 100 male narcoleptics. The initial test dose of caffeine that *was chosen* was 300 mg two times every day. In these subjects a history of narcolepsy *had been confirmed*. When they *were administrated* a dose of 600 mg two times every day, the lowering of their symptoms of narcolepsy to a level that *is considered* in literature to be normal *was accomplished.*

THE ACADEMIC ARTICLE: AN OVERVIEW

Because some journals cannot afford to hire copy editors to correct manuscripts line by line, examine articles in the target journal to determine key elements of the style guidelines you should adhere to. Avoid, however, blindly trusting them as models of style.

What seems wiser is to trust the target journal's own writing style. This style is demonstrated in **'Instructions to Authors'** and in journal editorials. Every journal has its own style, so study all instructions in the target journal. Seek instructions also on the internet; these evolve and thus frequently change. **Follow each instruction precisely**, checking and rechecking.

If you receive a **rejection** and submit elsewhere, follow the next target journal's instructions equally carefully. (See Handling Reviewers section below.)

Notice the style required for your **references**: either Harvard or Vancouver.

> **Harvard** style (from 1881) uses authors' names: *'*(Aho 2000)*'* and an alphabetical reference list.
>
> **Vancouver** uses numbered references, with each journal demanding different formats.
>
> The usual formats are '… sentence end (3).' Or '… end [3].' Or '… end.[3]' (USA) Or '… end[3].' (UK)
>
> (Vancouver Uniform Requirements are available at http://www.icmje.org/index.html.)

Unlike authors in a **Harvard reference list**—numbered alphabetically—**Vancouver** style requires that the list follows the order in which citations appear in the text. In **Harvard** style, date precedes article or book title; in **Vancouver** style, the date follows it.

George Hall's edited volume (2003) provides a clear **pattern for the contents of a scientific article**.

- the **I**ntroduction tells what question you will be asking,
- the **M**ethods tell how you studied it,
- the **R**esults tell what you found, and
- the **D**iscussion explains what the findings mean.

> This produces the acronym
> **IMRAD or IMRaD**

In 'Suggestions to Authors' in the journal *Neurology* (1966; 46:298-300), Daroff and colleagues describe these IMRAD sections as answering the following questions:

- Introduction: What did you decide to do and why? (ending with what you seek)
- Methods: How did you do it?
- Results: What did you find
- Discussion: How does it relate to current knowledge? (beginning with main findings)

Depending upon the journal to which you are submitting the individual sections may differ slightly. However, most if not all follow the IMRAD format. Once you know what sections you need to write, you must then write them. A wise order in which to write these sections is as follows:

1. Rough draft of the abstract	**5. Results**
2. Rough tables and figures	**6. Discussion**
3. End (your aim) of Introduction	**7. Rest of the Introduction**
4. Methods	**8. The final abstract**

I cannot advise this too strongly: create the tables and figures before you write your Results.

Note: Gustavii reminds us that editors of journals and your readers have the right to ask to examine your raw data—even **5 or 10 years after publication**!

Therefore, **never discard your raw data.**

Titles

There is no one way to craft a title.

Although the title is the first part of the research paper that will be read, it is often the last to be written. Swales & Feak (1994) suggest that the research paper title should:

- Indicate the topic of the study.
- Indicate the scope of the study (i.e., neither overstating nor understating its importance).
- Be self-explanatory to readers in the chosen area.

Professor Lilleyman (Hall, 2003) reminds us that even before reading the abstract, we read the title. A poor title may result in immediate prejudice against the author. Lilleyman prefers that the title be descriptive and indicates only what the article is about—neither why you wrote it, what you found, nor the conclusions you reached. He might prefer the very first title on this page.

Björn Gustavii would disagree; rather than a **descriptive title,** he prefers providing an indication of the outcome with a **declarative title.**

Titles are always written in the present tense and are not too general…

Trends in living alone among elderly Finns

nor too detailed:

Figures for living alone among 3000 men and women aged over 65 in southern Finland from 1950 to 2000 rise from 17 to 37%

This 'rise from 17 to 37%' is more than a suggestion of Results! It is too specific for a title. An alternative to these two titles above should provide sufficient detail to indicate what the study's topic included as well as the method of study and the results. Consider these alternatives:

- Comparative demographic population-based study of trends toward living alone among those over 65 in southern Finland, 1950–2000 (avoid articles in titles except 'the' preceding unique items such as 'only,' 'usual,' 'best,' and 'elderly').
- Increased solitary living among the elderly of southern Finland, 1950–2000: A population-based study (this is professional, and the colon (:) is popular. We have reduced this from 24 to 14 words and moved the focus forward. To be very concise, we could reduce it to 12 or even to 7 words).
- Living alone among Finland's elderly: Trends toward an increase, 1950 to 2000 or The elderly in Finland: solitary living, 1950-2000

Turning to the **descriptive** vs **declarative** title, compare the following examples:

Influence of aspirin on human megakaryocyte prostaglandin synthesis

Compare this to the **declarative title** of the classic article by Nobelist John Vane (*Nature*, 1971):

Inhibition of prostaglandin synthesis as a mechanism of action of aspirin-like drugs

(Note that this title needs no verb, because that powerful '**as**' already means 'is.')

Capitalisation? Titles on this page are all 'down'—only their first word is capitalised (more UK, British). This book's section titles are 'up and down' — the main words are capitalised (more USA).

Colons are widely used in titles, typically to separate ideas in combinations such as the following:

- *Before the colon: After the colon*
- Problem: Solution
- General: Specific
- Topic: Method
- Major: Minor

Problematic titles tend to be too general, too detailed or do not fit with the overall topic of the article. Another problem, not only found in Finnish articles but common to highly specialised fields of study includes abbreviations not known or used outside of those fields of study. In general, avoid abbreviations in titles unless they are known to the general public (e.g., HIV, DNA, etc.). Finally, avoid full sentences in titles for academic articles.

Sample titles include the following broken down by topic:

From natural science journals:

- Initiation of Franciscan subduction along a large-offset fracture zone: Evidence from mantle peridotites, Stonyford, California
- Continental stretching preceding the opening of the Drake Passage: Evidence from Tierra del FuegoCastrating older lambs: What are the issues?
- The exceptional Alpine south foehn event of 14–16 November 2002: a case study
- The active tropical cyclone season of 2005–2006 over Northwest Australia: Operational model performance and high resolution case studies
- 'Farming on the edge' in arid western South Africa: climate change and agriculture in marginal environments
- Sea level is not level: the case for a new approach to predicting UK sea-level rise

From medical / health science journals

- Reconciling city and country: China's lessons for a divided world
- Empowering young leaders for social justice in health
- Cuba's focus on preventive medicine pays off

From the humanities / social sciences:

- Are mixed economies persistent or transitional? Evidence using social networks from arctic Alaska
- The future of global trading regimes: Three scenarios
- The Wordsworths' poetics of hospitality

Authors

Editors often now require a **declaration of participation** stating each author's contribution. You must thus be able to justify the actual contribution of every author listed: Original idea? Planning? Data collection? Statistics? Journals often now print, with the article itself, a list of their roles. This serves to discourage an authors' list numbering 50, even 100!

Often each author must sign a statement agreeing to be an author and accepting responsibility for all article content. This discourages the vice of listing some authors who may never have read the text and accept no responsibility, especially not for scientific fraud or plagiarism.

'Contributors' at the end of the article—if the journal prints this—can include those who provided aid, but insufficient aid to be called authors. Thank other individuals in **Acknowledgements.**

Closely follow **journal style for authors and for degrees, if included.** In English, degrees never precede names:

Aho, A.
A. Aho
Aho, Antti
Antti Aho, MD, PhD

~~MD A. Aho~~
A. Aho, MD

Note the commas around degrees. How the journal formats the author list and links authors' names with their institutions vary from journal to journal. Check the style before you begin drafting and follow the guidelines and journal preferences as you format your submission.

The Article Abstract

The abstract (now generally considered the same as a summary) is the first thing read from your article after the title. It may be the only part of the article that is read.

The abstract 'floats free,' appearing in various databases and on the internet. For easier electronic retrieval, front focus both your title and the first line of your abstract.

According to Professor Lilleyman (Hall, 2003) an abstract should reveal:

- 'why what was done was done
- what was done
- what was found
- what was concluded.'

And, … the abstract must be '**the most highly polished part of the paper.**'

Lilleyman's rules include the following:

- Include no lines that will appear again in the Introduction.
- Avoid minor aspects of Methods.
- Never end an abstract with the vague, useless line: 'the findings are discussed.'
- Include confidence intervals (CI) and p values.

I add, from other sources the following additional guidelines:

- Keep sentences short
- Be clear and brief and try to avoid abbreviations
- Describe theories, methods and results in the past tense
- Discuss results and conclusions in the present tense; avoid perfect tenses

- Include all appropriate articles *(the* and *a)*
- Do not repeat data / information from the article title
- Do not refer to references or study limitations in the abstract

Abstracts must stand alone and be clearly understandable without the text.

Always obey length restrictions set by the submission guidelines. Typically, you'll want to limit your abstract to 100 words, 150 or 200 words, depending on the instructions provided. If there is a limit, follow it.

Repeating abstract lines in the rest of the article. One writer crafted an excellent abstract and then copied it piecemeal throughout his article: two lines from his abstract began the Introduction, more lines from his abstract began Methods, some lines appeared in Results. The Discussion ended with exactly the same lines as in the Abstract. I call this not plagiarism, just laziness. Some members of the European Association of Science Editors (EASE) disagree. You write a good line, said one, so why not use it again? But the abstract is unique, comes first, and who enjoys reading repetition? We learn nothing more on the second reading.

The most common abstracts have four parts:

1. **Problem:** This includes the author's intention, thesis, purpose, hypothesis and goal. It answers such questions as: why was the work done? How did this goal differ from others? What motivated the research?

2. **Methods:** This includes the scope, kind of treatment and data used. It answers such questions as: What was done and how? What methodology was used? What limits were imposed? What was the experimental design?

3. **Results:** This includes the findings and a summary of the results. The bulk of the abstract should be devoted to results.

4. **Conclusions:** This includes the implications and inferences drawn, the value of the findings and the interpretations of the results. In other words, what may be concluded?

Common problems in abstracts include unbalanced elements. Typically, you'll want your results to dominate the content in your abstract. However, many writers focus on the introduction or background information or the methods employed. Readers want to know your results and their implications. So, focus your attention on the results and spelling out their implications.

The types of abstract and how to write one effectively are summarised at the following sites:

- http://leo.stcloudstate.edu/bizwrite/abstracts.html
- http://writingcenter.unc.edu/handouts/abstracts/

Example Abstract

IMPROVING THE EFFICIENCY OF THE SUPPLY CHAIN FOR PORK IN FINLAND. ISOSAARI, Heikki. Pellervo Economic Research Institute Reports No 167, 63 s. ISBN 952-5299-06-6, ISSN 1456-3215.

Abstract: The study analyses the efficiency of the Finnish supply chain for pork compared with the same supply chain in Denmark. The analysis includes a description of structures in the chain. Then the critical points in the supply chain from the efficiency point of view are studied. The Danish pork

industry is ten times larger than the Finnish one. The Danish share of EU production is 10%, but the Danish share of the EU exports is over 50%. 80% of the Danish production is exported. The study concludes that it is essential to improve the cooperation of the different agents in the Finnish pork supply chain. In Finland, a body, which would co-ordinate the subjects of interest for the whole supply chain, is needed according the model operating in Denmark.

Key words: pork production, supply chain, vertical co-ordination

Source: http://www.ptt.fi/en/index.html (Pellervo Economic Research Institute)

Tables and Figures

Before drafting your article or manuscript, you should have a fairly concrete idea of what results you'll be summarising. Before you begin drafting the individual sections of your manuscript, decide which tables and figures you intend to include to showcase your findings. You may have more than you need for any one particular publication. But, sorting these out before you begin drafting will save time later in the process and help to keep you focused on the most relevant information to include. This section provides some tips for creating and using tables and figures effectively in your manuscripts.

One table per 1000 words is appropriate, laid out tall and narrow — not wide and flat. Journals typically avoid printing wide tables spanning two pages; rows may fail to line up exactly.

Use **telegraphic title style without verbs or articles:**

Levels of enzyme X in melanoma
Influence of European Union rules on Finnish forestry

(These are descriptive titles)

Avoid repeating the table title or figure legend in the text. For example, **i**n a text, a sentence such as, *'*Table 6 shows the condition of molars assessed by the Wibble Method,' should never appear immediately before a table that is entitled 'Table 6. Condition of molars assessed by the Wibble Method.' Instead, describe some Wibble-related results and add the table / figure number in parentheses:

This particular method predicted 78% of third-molar caries (Table 6).

These data suggest a trend toward a 2% annual rise (Figure 3).

Number all tables/ figures **in the order of their appearance** in the text. Mention each one, preferably only in parentheses (Table / table 6), (Figure 3 / fig. 3), (Figs. 3–4*)*, and use the style of reference to tables and figures preferred by the specific journal to which you are submitting.

Avoid tables containing fewer than six or eight figures. In the text itself you can write, *'*Of the ten patients, one lived for 6 years, one for 8, three lived for 10, and five for 11.*'* These few data (eight figures) require no table. (Note also the alternating word-vs.-number style.)

Similarly, avoid telling us in the text more than three or four findings from a table. Just **generalise** what is most important, the highest or lowest or what is significant.

Most readers study tables and figures first, so save them from any need to search through the text to understand any term or any abbreviation. To do this, **explain each term or abbreviation** in a footnote. Alternatively, give the abbreviation in parentheses in the title / legend ('Figure 1. Three populations of obese (OA) and lean adults (LA) in Finland, 2005') or give abbreviations in column headings.

Omit from the table title, however**, any words appearing** (nearby)**,** word-for-word**,** as headings for that table's columns. Remember, each word costs publishers money. Avoid **heavy repetition in tables** of any words, phrases, abbreviations, or numbers. If your table includes columns of many (more than five) identical words or figures, re-think its layout. No column should contain a stack of identical words or numbers. Omit repetitious items entirely. **Omit identical words where possible.**

Stage 1
~~Stage~~ 2
~~Stage~~ 3

Indent subordinate items with a tab and single-space them. Gustavii argues that the only **single-spaced** lines in an article manuscript should be these **indented** second-line sub-headings:

Obesity
    in children
    in adults

Similarly, columns containing mostly **identical p values** are **unnecessary**. Insert footnote symbols into other columns for any significant p values, and below the table give p values and mention the statistical tests providing those values.

*p < 0.001 (Mann-Whitney U-test)

In a table, **each column must be justifiable. Replace some data using footnotes** or in the title. As for **layout,** Gustavii feels that numbers being **compared** are easier to read if they **follow down** the columns, not across.

State the **number of items or subjects in every title / legend or in a column heading**. Replace any column of identical figures with—perhaps in the title—'(n = 20).' Use a lowercase 'n' for a portion of the total, reserving capital 'N' for the entire population / sample.

For each empty cell in a table, add a **space-filler (—)** to guide our eyes across columns.

Ensure that **multiple-part figures or tables have clear numbers or letters** nearby (1, 2, 3; A, B, C), with letters consistent in terms of upper- (A, B, C) or lower-case (a, b, c).

In figure legends, **show your actual symbols** or print them on the figure itself. For instance, write 'The men (■) numbered 16' in the legend or indicate 'Men – ■'on the figure itself. Be clear and consistent to avoid confusion.

If you provide **names instead of examples for lines on a graph**, write 'broken' or 'dashed' (- - -), 'solid' (—), or 'dotted' (. . .) lines.

Gray **areas** are 'shaded.' Dotted areas are 'stippled'·∴·∴·∴ . Write 'hatched' for /////// or 'cross-hatched' for XXXXX. Or just show them.

As **footnote superscripts,** check the journal preferences first. The following serve as guidelines commonly used currently:

Check target-journal style!

- Vancouver style prescribes *, †, ‡, §, II, ¶.
- When you need more, you start doubling them, as in **, ††, etc.
- Avoid odd symbols such as dollar ($) or pound (£).
  Many now prefer 'a, b, c, d,' etc. as superscripts.
- P values are typically indicated using * and ** and ***.
- If the journal uses superscript Vancouver citation form, never confuse us by choosing superscripts for anything else, such as footnotes, numbers ('1, 2, 3, 4….').

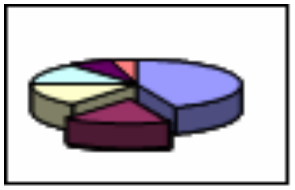
Histograms show frequency distribution. Avoid using more than five or six vertical (sometimes horizontal) bars. Label them clearly below the axis, above them, or on them, or add a key showing each pattern / colour of a bar. Choose clearly contrasting colours or shading, hatching, or stippling.

Pie-charts show percentage distribution. They require strong contrast in colours or patterns. Gustavii's books (see Resources) cover tables and graphs well, describing a pie chart thusly:

'(1) the **largest segment** begins at 12 o'clock;
(2) it continues with **proportionally smaller portions** in the clockwise direction;
(3) the number of segments does **not exceed five**; [in these models, six!]; and
(4) **labels** are placed **outside** the pie (a legend works best).

For emphasis, **one sector can be separated slightly**.'

Some find it easier to read a pie in **three dimensions, set at a slight tilt**.



The Introduction

You'll want to start strongly. Thus, the first sentence of your introduction should feature a strong opening conveying the importance or relevance of your work.
A good introduction, according to John Swales and Christine Feak (2012), usually contains four 'moves' (or strategies):

Move I: Establish the field: Assert briefly the significance, relevance, and importance of your chosen topic. This usually requires no citation.

Those smart enough to read this publication would not demand evidence.

The world's highest incidence of type-1 diabetes occurs in Finland.

Move II: Summarise your predecessors' more general research. Here, we usually find the literature review.

On this question, Soto's 1993 report was the earliest.

Move III: Hone in on your own research project. In this 'however' move, indicate a gap in knowledge to be filled, a question to answer.

> Seldom has this issue arisen. Data on this are few.

Move IV: Introduce your own research by stating the question you wish to answer, what you hope to discover, what hypothesis you will test. Novel methods can earn a brief mention, but rarely will an Introduction include any results. Check your target journal on this.

> This study tests the hypothesis that X **is** Y.
> To discover whether X correlates with Y, we examined… [perhaps adding] … by use of a new method for ….

The answer to this question, your discovery or confirmation—yes/no—will begin the Discussion, where the citations closely related to your own work (pro and con arguments) also belong. I dislike meeting low-numbered citations again in the Discussion.

An Introduction mentions (in Move II) general works relevant to yours, showing that you know what has been done in this area. You need not 'start with the Romans.' Omit facts known to every scientist. Never knock your readers down with a long parade of facts.

Richard Smith (*BMJ*) in Hall, concludes thus: '**Know your audience**, **keep it short**, tell readers **why you have done the study** and explain **why it's important**, **convince them that it is better than what has gone before**, and try as hard as you can to **hook** them in the first line.' (Emphasis added.)

The Materials and Methods Section

The purpose of the Materials and Methods section is to allow a competent scientist to repeat your work. Since theses, reports and papers are likely to be used by your successors in the lab and by other scientists, as sourcebooks of methods, it is important that procedures are well documented and that details are correct. Once you've left the lab, it might be possible to fill in missing information by asking your supervisor or one of your former colleagues, but this is not such an easy option for someone across the Atlantic who is struggling to repeat your work.

In my opinion, one of the most common mistakes is for authors of theses and papers to quote irrelevant information, while missing out the essential details. The purpose of these notes is to help you decide what is, and what is not, important information.

Referees seem to focus half their criticism here. Although they demand sufficient data to allow others to replicate your work for confirmation of its findings, **this section must be brief**.

Some journals use **reduced font size for Methods**. Some place **methods in lengthy table titles and figure legends**. Some want your **specific Methods details only for online content**.

When you write your methods section, you'll want to follow these guidelines:

- **Observe strict chronology**. Report each step / event in a clear time-order, in the order in which each occurred. Never 'We did X after Y' or 'Before we did X, we did Y.' Write 'We did Y, then X.'
- **Write in the past tense**. Write long, and then cut, cut, cut out all useless, wasted words.

- **Methods will be list-like.** If you refuse to use 'we,' Methods will require some passive-voice verbs, but not at sentence-end**,** where they sound empty ('For X, the value of Y' vs. 'Y was used as the value for X.' In the active voice: 'Y served as the value for X.')
- **Hide passive verbs** in the middle of the sentence, or substitute adjectives or nouns. **(**See Process Writing.) Revise thusly:

> **With adjectives**: 'X was used for Y.' → 'X was useful for Y / the best choice for Y.'
> **With nouns**: 'X was the choice for Y.' → 'For Y, the selection of X proved best.'

- **Attempt end focus,** but linkage in this list-like section is often impossible.
- **Present** all that the reader needs to know. Study target-journal Methods sections as a guideline.
- Conventions for describing suppliers of equipment and samples appear on page 53, at #22.
- **Say who did what to whom.** When, and precisely how? Define all terms: For 'high X, 'delayed X,' or 'prolonged X' define how high, long, or prolonged.
- **Avoid numbers or letters for groups.** 'Groups A and B' gain descriptive labels: 'Milk' versus 'No-Milk mice'; 'Term' versus 'Pre-term infants'.

Observe standard (see journal instructions) **rules concerning animal treatment** and approval by an 'ethics committee.' This means **a committee ON ethics.** Though some journals may still print it, 'ethical' would mean that all your committee members are angelic. All other uses, as in 'ethical standards / principles / review' are, however, correct.

If subjects provided **signed informed consent**, was this **before or after study enrolment**?

- **Explain in detail all randomisation** procedures. Sealed envelopes? Computer program?
- Explain all **exclusion / inclusion** criteria. How many were screened and how many excluded?
- How many **dropped out** and why? How many were **lost to follow-up** and why?
- Define any **blinding** (of whom and how?)
- **Describe controls** or control samples as thoroughly as you describe your study—or test—population. This is essential to justify your claims to randomisation. How did you find / select / match controls?

Gustavii provided these points and stresses the need to '**calculate sample size needed to demonstrate a difference**, **if it exists**.' He wants this calculation reported in the paper and warns that the number needed is never the number of those originally enrolled, but the number completing the trial. (So subtract the drop-outs.)

If you have **complex populations or results** with complicated numbers, try to illustrate them with a flowchart or Venn diagram**.** Like genealogical charts, these provide clear, at-a-glance illustrations with visible boxes or circles. **Be creative**. Reviewers often prefer flowcharts for data hard to comprehend in text and for large quantities of data. Study flowcharts in prestigious journals.

End Methods with a description of your statistics. In the statistics description**,** state what you consider to be your (statistically**) significant p value**. 'Significance was set at p = 0.05'or is 'at p < 0.05' sufficient? Avoid 'X was ~~statistically~~ significant' more than once, unless this is versus **clinical significance**.

Avoid repeating quantities. For adults, omit 'years' — it is the default age-unit. The following examples omit 'years old' or 'years of age.'

'Respondents were (age / aged) 40 to 60.'
'Ages were 40 to 60.'
'Adults 40 to 60 took part.'
'Men over 50 / under 50 died sooner.'

Compare to: 'Children enrolled were from 14 months to 5 years old / of age.'
'Follow-up times ranged from 6 months to 10 years.'

In English, **we expect readers to recognise figures and words meaning years or months.** We thus write merely 'in 1999'or even 'in 1066.' And just 'in June.'

'The' goes, however, **before any superlative or unique word**: **'The third of May** / **the last day'** (See also Articles section.) For **further relevant tips,** see **Handling numerals, numbers and other small items beginning on page 51.**

The Results Section: Data commentary

If you have table(s), figure(s), or both, **avoid double documentation** — that is, never repeat in the text much that appears in tables and figures, because most readers examine these first.

According to Professor John Norman (Hall 2003), with emphasis added:

'What you must avoid is what any reader, editor, or assessor dreads: "The **results are presented in Tables I to V and in the figures**." This does not guide the reader into discovering what you want them to find but actively encourages them to find things you do not think important. **You must lead your reader into following your thoughts**.'

He adds that in the **Results you show the statistical significance** of your findings, and **in the Discussion, their practical significance**. He warns that if your findings do not support your original hypothesis—and even if they refute it—you must report all findings.

What is the answer to the question you asked? Or did you disprove the null hypothesis with a p value less than 0.05? What is the power of the study? How likely is a false negative? It is always wise to **seek aid from a statistician**.

The Results state—in the **past tense—**selected data, the most interesting results, the highest, lowest, or 'not shown.' (Why are they 'not shown,' in fact?) Avoid passive voice; let inanimate agents ('study / work / results') do the showing and producing. Or use 'we,' or at least 'our.' 'Babies were tested' / 'We tested babies' / 'Our babies tested positive.'

Do not evaluate here. Avoid using 'remarkably' (a strong emotional term for 'greatly / considerably / markedly') or 'This method's efficiency was greater than expected.' 'Surprisingly so should also not appear here.

End Results without a summary, because in Anglo-American journals, the discussion now almost always begins with a statement of your main findings. Some journals now force authors to do this by dividing their Discussion section into two sub-sections labelled '**Findings**' and '**Comment**.' A

structured Discussion is even emerging. See the next section for further details. Perhaps the journal publishing your work even combines Results with Discussion.

The following sample texts help distinguish the Results style from the Discussion (referral) style:

Results	**Discussion**
Of the 366 staff responding, those approving the plan numbered 89 (24%). The Whammo Method performed well for our patients less than one-third of the time. Absenteeism among the nursing staff of small hospitals from 2000 to 2005 compared to 1990 was four-fold. Older nurses, over age 50, were absent for fewer days annually (10 days) than were younger nurses (18 days).	That only a quarter of the staff approved the plan seems surprising. The Whammo Method's ineffectiveness may stem from its untested premises. Such a large increase in absenteeism involving so many younger nurses in small hospitals supports the suggestion of Piik (2005) that hospitals of this size may benefit more from our innovations than would larger hospitals.

The Discussion Section

Discussions tend to be the most variable section of a research paper. However, they usually include the following elements:

- Interpretation of points highlighted in the results section,
- Statement of key strengths or weaknesses of the study,
- Final conclusions, possibly with recommendations for future research.

In general, the discussion answers the question "What do your findings mean?" In the discussion you answer the question in the introduction.

After the Swales and Peak guidelines for an introduction, we waited a long time for a similarly convincing guideline for writing scientific discussions. The suggestions summarised here come from *How to Write and Illustrate a Scientific Paper,* from Cambridge U. Press, by Professor Björn Gustavii (See Resources), editor of *Acta Obstetricia et Gynecologica Scandinavica* from 1986 to 1994 and an instructor of scientific writing since 1980 at Lund University, Sweden. His book on compilation theses appeared in 2012.

Gustavii's 'recipe' for a discussion include the following ingredients (with emphasis added):

'**Main message**.' This, says Gustavii, '**answers the question** posed in the Introduction [in Swales and Peaks' Move IV] and includes the main supporting evidence.'

> These findings show that / support the hypothesis that X contributes to Y; its mode of action may be Z.

Note: Be careful with present / past tense throughout any Discussion. See Tense section.

Next, critique your own study. (This critique may also appear later in the Discussion.) A **'critical assessment**' will discuss 'any shortcomings in study design, limitations in methods, flaws in analysis, or validity of assumptions.'

Provide a '**comparison to other studies**' to demonstrate if and how other researchers agree with you. You may organise this by first describing **your main finding** which you then compare with **other studies' findings and how** your research is in agreement with it, differs from it, or contradicts it. Then, move on to **your secondary findings** (if your project is complex). Here, you discuss how **other studies' results** agree with, differ to or contradict these, and so on.

Next what we may think of as the '**So what?**' stage or the **Conclusions**. **Conclusions** provides a place to state your results' **implications** and suggest **further research**. You need no summary of findings here. They are in the abstract, implied in the Results, and they start the Discussion. **But, here, you reveal the value or consequences of your findings.**

Avoid priority claims such as 'This is the **first report** of X' or 'We are the **first to do this**,' because others may publish similar findings before your findings appear, 6 to 12 months after their first submission. Your editor will then receive the blame!

Gustavii wisely comments that 'most studies could be designated "the first," because most of them have a design of their own." In my own personal view, to modify a claim thus: '**To** (**the best of**) **our knowledge**, this **may be / seems to be** the first report of Y' is safe. The two modifiers even make this sound rather modest.

One opponent at a thesis defence asked why a researcher would want to claim priority. Could it even be the case that no one else was stupid enough to carry out such research? Let the findings speak for themselves, or merely say they '**represent interesting and unusual findings**.'

Avoid promising to publish more — who know what may happen to hinder further publications.

In close agreement with Gustavii's Discussion pattern, the *Scandinavian Journal of Primary Health Care* offers 'Instructions for Authors,' provides a structure for a Discussion section with sub-headings as follows:

1. Statement of principal findings;
2. Strengths and weaknesses of the study;
3. Strength and weakness in relation to other studies, discussing particularly any differences in results;
4. Meaning of the study: possible mechanisms and implications for clinicians or policymakers;
5. Unanswered questions and future research.

The References / Works Cited Section

If you gain the information you use from a published source then you must give a reference for that source. For each submission for publication you prepare, you must consult the individual publications style preferences for the reference list, as well as the in-text citation style preferences.

In-text citations

In your text, where you refer to another person's work, include the name of the author and the publication date:

Willmot (2008) found that hedges next to roads contain more woody species than those between fields.

In some areas, hedges between roads have been found to contain more woody species than those between fields (Willmot, 2008).

Where there are two authors, the names of both are given. However, if there are three or more authors then cite only the name of the first author, followed by '*et al.*' (e.g. Smith *et al.*, 2009). Where you cite multiple reference sources together, list them in chronological order (e.g. Wilcove *et al.*, 2006; Saunders *et al.*, 2008; Opdam *et al.*, 2010; Robinson *et al.*, 2011).

Compiling a bibliography

When compiling a list of references you have used to acquire information for your assignment or that cited in your text, it is important that these references are complete and accurate. Any reader will then have the necessary details about a book or article to find it to review the original text. There are several ways of presenting references in a bibliography, but it is important that you are consistent in your style. Below is one common method:

Journal / periodical article:

Hanski, I., Alho, J. & Moilanen, A. (2000). Estimating the parameters of survival and migration of individuals in metapopulations. *Ecology* **81**, 239-251.

Book:

Hanski, I. (1999). *Metapopulation Ecology*. Oxford: Oxford University Press.

Article or chapter in book or conference proceedings:

Ims, R.A. (1995). Movement patterns related to spatial structures. In: L. Hansson, L. Fahrig & G. Merriam (Eds), *Mosaic landscapes and ecological processes* (pp. 85-109). London: Chapman and Hall.

Electronic sources

Information is increasingly becoming available via electronic media such as online journals and electronic databases. For tips on how to cite references from electronic sources follow the link below to the Internet pages of the Online Writing Lab http://owl.english.purdue.edu/owl/resource/584/01/

Other considerations

- Prefer **reviews and the earliest and best articles**. Omit poor, weak papers.
- **Check and recheck** all references and keep a copy of each reference cited**. Errors in references** (incorrect or inconsistent order of items, punctuation, upper- versus lower-case letters, abbreviations) **are signs of carelessness.** Errors may occur in half a work's citations. Nor is the internet reliable; it too makes mistakes in spelling, dates, or pages. Such errors that disillusion editors and reviewers can—publicly—irritate your opponent!
- Study the style of your **target journal** or the style recommended for **university theses**. Language revisers' tasks rarely include editing references, so you are on your own! (See page 14 for an overview of Harvard and Vancouver styles.)
- **Each reference mentioned must appear in the works cited list**, and you should have read them all.
- For '**personal communication**' data, **obtain the permission** of the 'communicator.' Provide **in the text** full details concerning the source, stating whether it was 'oral' or 'written.' **No personal communications** go into your reference **list**. List anyone's submitted **and** accepted work as 'in press.'

The Acknowledgements

Acknowledgements typically follow the Discussion and include some or all of the following elements (Adapted from Swales & Feak 2012):

Financial support. This typically includes any foundations or agencies who financially supported the research through grants, etc.

> Support for this work was provided by (sponsor).
> This research was partially supported by a grant from (sponsor).
> This research was funded by Contract number from (sponsor).

Thanks. This typically acknowledges those individuals who provided technical expertise or knowledge or who worked on the research or manuscript in a capacity beyond co-author.

> We would like to thank A, B and C for their help…
> I wish to thank A for his encouragement and guidance throughout this project.
> We are indebted to B for …
> We are also grateful to D for …

Disclaimers (following element 1 or 2). This allows you to acknowledge those who assisted you, and also accept responsible for your own work.

> However, the opinions expressed here do not necessarily reflect the policy of (sponsor).
> The interpretations in this paper remain my own.
> None, however, is responsible for any remaining errors.
> However, any mistakes that remain are my own.

Other versions. This is reserved for those instances when a manuscript appears through a process of evolution from preliminary / earlier versions presented at conferences, etc., and was substantially revised before publication.

> An earlier/preliminary version of this paper was presented at (conference or seminar).

Source. This is used when a publication is based on a piece of work that previously appeared as a portion of a doctoral thesis or dissertation. You want to reference the source material.

> This article is based on the first author's doctoral dissertation.
> This paper is based on research completed as partial fulfilment for the Ph.D. requirements at (university name).

PhD Theses / Dissertations

All nations and universities differ, so here we include only a few tips on the summary /overview / *yhteenveto* for a compilation PhD thesis. (Caution: In the UK, 'dissertation' refers to an MA / MSc thesis, so a safer term for both is 'thesis.') For a more thorough resource, see Björn Gustavii's new book, listed on page 62.

Title page: See title section. For your big day, write '**12 noon**,' or '**12.00**'; not '12 ~~o'clock~~ noon.'

Table of Contents: As in titles, avoid full sentences and most articles. **Avoid too detailed chapter numbering** (e.g., '3.1.2.5.1'); even three places seems odd to non-Finns. Finally, you or your computer must ensure that all subtitles in your table of contents and in the text match one another.

Your original publications: You must request and receive **permission from the publishers** to **re**print these at the end of your *yhteenveto*. If they are '**Accepted**,' they are not printed yet, so say 'printed by permission of….' If '**Submitted**' only, do not mention the journal; you do not then need permission. Any **letter or short report** should appear here, says Gustavii, if vital to your thesis; he reminds us that the Watson & Crick's 1953 publication on the double-helix was just a 'short report'!

I call these **articles or papers** '**Study I' or** '**Study IV,' capitalised,** because 'study' is such a common word. Then use '**(I)**' or '**(IV)** when referring to each in the text.' In a general context, 'study' is uncapitalised:

'For the first **study**, we….' 'All five **studies** showed invasion, **Study** II showing the least.'

Reproducing parts of *anyone's* work—also your own publications—in your *yhteenveto* / summary / overview, for instance, tables or figures, whether in full or as 'adapted' or 'modified,**' requires publishers' permission**. If you relinquished the copyright, you no longer own your own words; the publisher does. (See plagiarism section.) A permission line contributed by the copyright holder must appear, word for word, on each table / figure.

Rules on this become stricter every year. The topic of two of the last three EASE conferences was ethics; almost half of all presentations and workshops involved plagiarism.

Journals are not publishers. **Publishers** are Elsevier, Springer, Wiley—all reachable via the internet. 'Reproduced by permission of the *Lancet*' requires article title, authors, page numbers. A required permission line may thus be longer than the table title or the figure legend. If you retain copyright, however, you need no permission line. You must, however, inform readers of its source: '… appearing originally in [journal name, issue, page, and date].'

Artwork from your own lab requires a credit line to the artist, even if the artist is you. 'Figure drawn by Anu Mäki,' 'Figure / Photo by the author.'

If you reproduce an image from online, if 'public domain,' say so. Or 'from Wikipedia Commons.'

Tables created specifically for the thesis itself—never published—need no credit line.

Referring readers to your original articles with '(See Study III, Table 6, p. 888)' saves effort and space, but **e-theses omit the original articles.** Unless they are easily accessible, tables and figures should thus probably be reproduced in the *yhteenveto* itself **but with permission**!

Rules for permissions change rapidly. So, check this information carefully and in a timely manner.

Literature section: This may be the most difficult part to write. **Never plagiarise lines from others' or your own published articles** (see above, and Plagiarism section). Close the book / journal and create fresh wording (a paraphrase) or put irreplaceably elegant lines between quotation marks.

Do NOT cut and paste. Italics are expensive and difficult to use consistently. It's best to avoid them.

Aims: Avoid repetition. End the introductory line ('The aims of this project / study / work are the following:') using enough words so that each aim in the list contains only new information. Your **aim**

is not to **investigate** a topic but to **discover** truth. Avoid synonyms like 'to investigate / to explore / to determine / to assess,' or you sound like a thesaurus. You are writing science, here, not writing poetry. In all manuscripts, synonyms are a curse.

Use consistently formatted bullets for each aim (and keep the formatting consistent throughout your manuscript), or number them.

Make all **AIMS grammatically parallel,** for instance, all infinitives, all participles, or all nouns. As a **model aims** section:

The main aim was to discover the effects of drug X on Y disease. Specific aims were to discover the:

- effect of long-term X treatment of Y-affected patients on their cell-mediated immunity (I);
- long-term efficacy and safety of X in Y-affected patients (II, V); and
- pharmacokinetics and long-term safety of X for infants under age 2 (III, IV).

Methods and Results: In **Methods**, try to avoid much **cutting and pasting** of Methods from your original articles. Paraphrasing biochemical methods is, however, so difficult that some techniques can usually be carried over from your articles with little alteration. See page 53, #22, for suppliers' addresses.

In **Results**, you must avoid plagiarising passages. Any identical phrasing should appear between quotation marks. State the facts in your own fresh words. Years may have passed since you wrote your articles. You have matured, and your thinking and language mature as well. Re-state what you found and paraphrase yourself as you paraphrased others' lines.

Today, in the medical faculty, '**cutting and pasting'** is illegal. Do not imitate theses from years ago which lack permissions and plagiarise. Constantly picture your thesis as an **ethesis**, freely accessible online. Its most eager readers will be those from whom you are tempted to plagiarise. Beware. Sanctions and academic blacklisting are becoming more frequent.

Try to create new tables and figures synthesising or consolidating study data from several or all of your studies. Opponents seem delighted with such syntheses. Opponents, reviewers, and editors appreciate **flow charts** and **Venn diagrams**. A picture is worth thousands of words.

Discussion: In a thesis summary or monograph, you may **start the discussion with background details**. You need not state your findings first, as in an article.

Beware, however, of repeating the Literature. The Literature section will be more general or historical. Try to avoid citing many or even any of the same works in your Discussion that have appeared in your literature review. (I give this advice also for articles: avoid having Introduction citations appear again in the Discussion.)

As in an article, discuss your results / findings, rather than repeating each in much detail. Remember that yours and others' theorizing is in present tense. (See the Tenses section.)

Handling Permissions in Theses and Articles

If you visit a friend overnight, you use the guest room, bed, towels, soap. But if you forget your toothbrush, you would **never** use someone's toothbrush—at least without permission. One's own tables, figures, and lines are as personal as a toothbrush. See the "Plagiarism" section

NEVER cite a source for a table / figure on its page in this manner, although check the style guidelines for the publisher:

> Table 3. Enzyme X in pancreatitis (Smith 2010)
> OR
> Enzyme X in pancreatitis (14)

If you create **a new table / figure using data** from another person's work—data not in a table or figure, then use '**Based on data from…**.'

If the publisher holds the copyright for the source from which you wish to reprint a table / figure, you must **request permission to reprint and ask for a permission line**. Your title stands alone at the top; usually your legend sits at the bottom, looking thus:

> Table 3. / Figure 3. Enzyme X in pancreatitis

And at the bottom of table / figure:

> Reprinted / Reproduced (here) with the publisher's permission.
>
> Reprinted / Reproduced (here) with the permission of [Name of Publisher], from Smith, JC, 'Pancreatitis can be fun,' in *Medical Comedy* 2010; **73**(1): 13.

If the publisher does not supply a detailed line, note these thesis examples:

> Reprinted with permission from the website owner. From Creative Commons.
> Permission to reproduce granted under BioMed Central's general terms.
> Photos reprinted with the kind permission of the authors /artist.
> Photograph by the author. Image: Mary Maro.
> Table with kind permission from Springer….

Some think that a small **alteration in a figure or table** allows them to reprint it without permission. No! You must add '**Adapted from**…' or '**Modified from**… ' and **still ask for permission. (**Perhaps the publisher must first see the adapted / modified version.) One opponent repeatedly asked a candidate during the defence why highly modified figures did not mention modifications. Rules grow stricter each year; scholars seem to grow more suspicious.

With no adaptation / modification, **reprint all items exactly as copyrighted, with no revisions**.

If you wish to **create a new figure** based on two or more published figures, request permission from the publisher(s), and if possible, from authors and artists. For instance, you admire a complicated **arrow** showing physiological process X, and in another publication a **stair-step** illustration of that same process X. You want to show X as an **arrow climbing a staircase**. You must **ask permission from the two original publishers**, perhaps attaching your proposed combined figure. Cite them both completely.

MATTERS OF STYLE & LANGUAGE

This section provides some helpful tips on matters of style and language, specifically addressing academic English. Additional resources you may wish to consult to help improve the style of your writing appear in the Writing resources section on page 62.

Tense-choice in Academic English

In academic writing, we tend to limit ourselves to the present and past tense. In rare instances, you can rely on future tense (primarily reserved for grant proposals and discussions of future research plans).

The following provides examples of the **present tense verb** construction:

> **Established knowledge:** 'Finland **has** the world's highest rate of X infection.'
>
> **Others' general findings:** 'Aho **found** that no evidence for X exists.'
> This verb can be in the present tense as well, if it sounds logical ('found' → 'finds'), but usually refers to a living author: 'Aho **suggests** / **states** that X is Y.'
>
> **Your own goal** in the introduction or abstract: 'This study **attempts** / **will attempt** / **attempted** to discover whether X **falls** when Y **rises**.'
>
> **Yours or anyone's theorising**: 'We **hypothesize** that X **is** —' 'Results **may** depend on population size.' 'It **seems** that mice very seldom **die** from over-eating.'
>
> **Contents of tables or figures**: 'Table 2 **includes** further details.'

The following provide examples of the **past tense** verb construction:

> **Specific details** in yours or others' **published work(s)**: 'We / Aho **found** that the two years with the highest rates **were** 2002 and 2004.''Only six of the mice **survived** (Aho 1999).' (**past** tense)
>
> **But generalise to:** '… ***showing*** that, under these conditions, very few ***survive***.' (**present** tense)
>
> **Others' general findings if logic demands**, often in a list of findings: 'At this temperature, most mice **died** (8), but after immediate air-cooling, those that **died** **were** few (9), and when immersed briefly in cold water, all **survived** (10).' (Note **end-focus x 3**!)
>
> **All of your own current work**: 'Subjects **stated** their ages.' 'X **formed** a Y.' 'None of them **arrived**,' except for things truly permanent: 'The city ***is*** in Savo; its trees **were** mainly birches.' (Cities do not move, but trees die.)
>
> **What others have said:** Aho (1999) **predicted** that this test ***will become*** the gold standard.' (Present tense '**predicts'** is also acceptable here; see under present tense.)

Perfect forms are fine for data most similar to yours in topic or findings: 'We found that mice **died** at -20 degrees, and in Smith's work (2006), mice ***have died*** at a similar temperature.'

The **present perfect tense** is also useful: 'X ***has*** *never* ***survived*** where Y ***is*** a common virus (6).' The **perfect tense** brings events **up to the present**: 'No one ***has shown*** [and still haven't] X to be true.'

If I cannot decide between past and present tense, I choose **non-temporal forms (ones indicating no time)—such as participles and infinitives**.

Citations and Layout

Avoid repeating the same citation several times with no intervening citations, even if it is given only as '3' or '(3)' or a superscript.[3] You can do this by using pronouns to link findings back to their source:

> Brown et al (1998) found X. **They** continued with Z. In **their** study, A was B; **their** findings also showed that Y was Z, although Smith et al (2000) have disagreed with **their** conclusions.

Never repeat parenthetically **citation data** you have—in Harvard style—already given. Choose between the following options**: 'Brown (1991)** suggests that X is Y' or 'X is Y **(Brown 1991 / Brown, 1991)**.'

> '**Aho** found that X is Y (~~**Aho**~~ **1991**).'
> 'X is Y (**Aho 1991**).'

Sentence-final citations in parentheses save words with no effect on end-focus. Devoting the second most vital position in a sentence to a name is wasteful; instead, place an important word there. You could, for instance, begin the sentence with powerful '**Never**' or '**Only**.'

I prefer listing authors in chronological order, starting with the earliest date. For citations from the same year, alphabetise them: (Laos 2000, Kerkel 2007, Laane 2009, Mare 2009, Bo 2010). For **multiple works:** '(Aho et al 1991, 1993, 2006).'

If, however, you agree closely with Brown, you know Brown personally, or if Brown is your professor, reviewer, or opponent, then the name as the subject of the sentence might be wise!

For **names outside parentheses**, journal editors now seem to favour writing '… Smith **and co-workers** (1991) succeeded' or 'Brown **and colleagues** (2000) found X' rather than '**et al.**,'. Whichever you choose, use it throughout. Synonyms always confuse or irritate readers.

Avoid the too-common Nordic use of '**e.g**.' **in citations**: '(~~e.g., Aho 1980~~).' Use 'see, for example, Aho 1980)…'. Because Vancouver style never allows 'It ended.[eg 6],' 'ended [e.g. 6],' or 'ended (e.g. 6),' bravely select the best work to cite. We know that other sources exist. Only occasionally will you need something like '(As best shown by Aho 1999)' or '(Reviewed in / by Aho, 2000).'

For in-text citations, consider the following models for minimising word counts:

> 'This ***is*** true of measles (Pop 1991), smallpox (Pip 1994), and typhoid (Pup 1999).'
> (In the present tense, because these three papers are published, and this seems to be a generalisation.)
>
> '… of diphtheria (5), smallpox (7), and influenza (8)."Or "Oho [3] and Ton [7], like Iho [9], found these diseases ***to be*** widespread.'
> (Note the infinitive).

Font issues: To italicise or not

Obey your target-journal style when deciding whether to use italics. Use them for Latin (not only for ***in vivo*** but also for e.g., i.e., AND for every ***et al***.)? Then you must also use italics for every foreign term, like ***laissez faire,*** or any Finnish or Swedish word. For your thesis, the choice is all yours.

Verbs for Academic Scientific Writing

Your own **research field supplies** enough **substantives**. You will need **a greater stock of verbs**. For first drafts, use boring common verbs ('to be / have / get / find out'); then revise for more specific.

Verbs are muscular; they move ideas along. Always, however, check connotations in an English-to-English dictionary, especially if you delight in rare words. In these groups of verbs, UPPER case indicates the stressed syllable; '+' means that this verb, spelled thusly, can also serve as a substantive.

to look at
obSERVE
view + / reVIEW +
perceive
reGARD +
appROACH +
be aWARE of
STUDy +

to compare
conTRAST +
match +
CHARacterise
probe +
reLATE
CORrelate +
asSOciate +
differENtiate
disTINguish

to balance
eVALuate
conSIDer
SPECulate
deCIDE
conCLUDE
acKNOWledge
ADvocate +
deFEND
conCEDE

to test
disCERN
inFORM
conFIRM
FALsify
afFIRM
enSURE
esTABlish
subSTANtiate
VERify

to be finding out
learn
see
search +
surVEY, (SURvey +)
inSPECT
inQUIRE
QUEry +
ascerTAIN (= check)
exPLORE
inVEStigate
iDENTify
aGREE
check +
deTECT
unCOVer
deTERmine
asSESS
ANalyse (vs. anALysis!)
CALculate

to show
INdicate
sugGEST
DEMonstrate
point out
exHIBit +
reVEAL
disCLOSE
disPLAY +
ILLustrate
exEMplify
make EVident
conTRAST +
apPROXimate
COMment on
asSERT
TEStify (to)
inTERpret
deFINE

to cause—from outside, something to decrease

reDUCE
curTAIL
cut +
deGRADE
dePRESS
diMINish
drop +
imPAIR
LESsen
LImit +
MINimize
MODerate
resTRICT
WEAKen

to cause—from outside, something to increase

raise +
adVANCE +
AGgravate
AMplify
aROUSE
ELevate
enHANCE
enLARGE
enRICH
exCITE
FOSter
HEIGHTen
imPROVE
inFLATE
inTENsify
lift +
MAGnify
proMOTE
proVOKE
STRENGTHen

Groups of useful or problematic verbs

'**ImPLY**' and '**impliCAtion**' are common & safe, but '**IMplicate**' always shows blame or guilt.

Beware!
To '**prove'** anything is
For **naive amateurs**;
it means proven forever, everywhere,
thanks to brilliant you!

Failure to prove is okay,
as is DISprove, meaning FALsify.

'**X clearly shows / undoubtedly is**'
'This **proved** / **has proven effective.**'
This 'prove' means **shown with some evidence**, and is safe.

To end-focus on a digit, use '**number**' as a **verb or** '**figure**' as a **noun**:
'Girls **NUMbered** 71;
the **FIGure** for boys
was 11.'

'**Answer**' → '**reply** /**resPOND**' (respondents);
'**give**' → '**proVIDE** / **supPLY** / **FURnish**.'

'**ConSIST**' is for ingredients (cake) and '**conTAIN**' for contents (of a pill).
'**InCLUDE**' implies less than 100%. 'It **comPRISED** 80 men' means in total.
'It **was comprised of** 80 men' is correct but needlessly wordy.

Upgrade spoken-English
'**There is / was / were X**'
to '**X exISTS / ocCURS / apPEARED / aROSE / eMERGED.**'

These verbs do differ.
Things **EXIST permanently**,
OCCUR regularly,
APPEAR suddenly,
ARISE theoretically,
EMERGE from something.
These can also help you in replacing passives.

Handy words
if all else fails:
reGARD/ inVOLVE / conCERN.

'**Regarding** this item…'
'She **regarded** it as complete.'
'**In regard(s)** to this issue…'
'**Involving** her was wise.'
'It **involved** effort.'
'**Concerning** this danger ...'
'The problem **concerns** funding.'

Academic writing is precise and requires precise verbs. Make sure you select the right one:

account for	Explain the **reasons** for, giving an indication of all relevant circumstances. Not to be confused with 'give an account of' which asks only for a detailed description.
analyse	Study **in depth**, identifying and describing **in detail** the main characteristics.
assess	**Examine closely**, with a view to 'weighing up' a particular situation. Consider in a **balanced way** the strengths and weaknesses of a proposition. State your judgement clearly in the conclusion.
comment	**State clearly** and in moderate fashion your opinions on the subject in question. **Support your views** with reference to suitable evidence.
compare	Look for **similarities** and **differences between** two or more things.
contrast	Deliberately **single out and emphasise** the differences and dissimilarities between two or more things.
criticise	**Give your judgement** about a statement or a body of work; explore its implications, **discussing all the available evidence**. Be specific in your examination.
define	Set down the **precise** meaning of something. Be prepared to state the **limits** of the definition. Take note of multiple meanings if they exist.
describe	Give a detailed and comprehensive account of.
discuss	**Investigate** and **examine** by careful argument. Explore the **implications and the advantages or disadvantages. Debate** the case and possibly consider any alternatives. This is probably the most common instruction term. It is inviting you to say something interesting in response to the topic in question.
evaluate	Make an **appraisal** of the worth of something in the light of its truth or utility. Emphasise the views of authorities as well as your personal estimation.
examine	Look at the **details** of whatever is in the statement that follows. This command word has broad similarities with analyse.
explain	Make plain. Account for. **Clarify, interpret**, and **spell out** the material you present, giving reasons for important features or developments.
illustrate	Make clear and explicit by the **discussion** of **examples**.
justify	To present **reasons** for conclusions or decisions.
outline	Give the **main features** or the **general principles** of a subject, omitting **minor** details and emphasising structure or arrangement.
review	Make a survey of, examining the subject **critically**.
summarise	Give a concise account of the main points of a matter, **omitting details** and **examples**.

Exercise #4: Academic Verbs

Choose a verb from the list that reduces the informality of each sentence. Note that you may need to adjust the tense of the verb to create a grammatically sound sentence.

assist	*reduce*	*create*	*investigate*	*raise*
establish	*increase*	*determine*	*fluctuate*	*eliminate*

1. The instruction manual for the meter can *help out* the user in case of problems.

2. The project was *set up* to improve access to medical care.

3. Research expenditures have *gone up* to nearly $350 million.

4. Improved health care services should *cut down* the number of working days lost through illness.

5. Researchers have *found out* that this drug has serious side-effects.

6. Building a new power plant will not *get rid of* the energy problem completely.

7. Politicians have been *looking into* this problem for several years now.

8. This issue was *brought up* during the meeting.

9. The fashion designers have *come up with* a completely new look for next summer.

10. The emission levels from this factory have been *going up and down*.

Formality Levels

Because academic writing demands precision, colloquial expressions and information language should be avoided. The following provides both informal and increasingly formal language which you may use in your writing.

Avoid these	**Choose among these**
a bit	a little, slightly, somewhat
a couple	two, a pair, a duo (for people, 'couple' implies man and woman)
a lot, a lot of, lots of	several, many, multiple (see 'plenty of')
anyhow	in any case, in any event, nevertheless, nonetheless
anyway	although, thus, however
besides; too	also, in addition, likewise; furthermore, moreover
enough	sufficient (insufficient is also useful)
fix (verb)	arrange, manage, handle OR repair, renovate, recondition
give (verb)	supply, furnish, offer, provide, yield
gone; none	lacking, absent; missing (think cops)
hard	difficult, demanding, laborious, time-consuming, taxing

let (v)	allow, permit, give permission for
little (= few)	few, insufficient, lacking, rare, scarce, sparse
look for (v)	try to find, seek (sought), search for
make	produce, construct, form, compose, build, create, originate, constitute
plenty of	abundant, ample (vs. sparse), numerous, frequent (occurring over time)
pretty; quite	somewhat, almost, moderately, not uncommon, not infrequent
quite X	very (a weak word), rather, considerably, noticeably, notably, markedly, greatly (I would avoid 'remarkably' as too emotional.)
so	therefore, thus, hence
start (v)	begin, initiate, undertake
take (v)	adopt (100%), adapt (with changes), transfer, possess
think X is	consider X to be, judge X to be, deem X to be
though	even though, although, notwithstanding
too	also, in addition, as well as, likewise
try (to)	attempt to / endeavour to
turn out (v)	prove/proven to be X (show by evidence; 'It proved to be a wise choice.')
way	means, approach, method, procedure, manner
work out (v)	solve, resolve, determine, devise, OR clarify, elucidate

(**Sources** include *The Words Between*, JM Perttunen, 2000, and many author-editors.)

Words Confused and Misused

The following represent words and phrases which are often confused or misused in academic articles. The following are listed alphabetically.

amount and number: 'Number' refers to **countable items**, as does 'fewer', as in fewer cells. Less sugar is uncountable. '**Each**' and '**any**' often prove useful when **maintaining the singular**, as in 'Of the 10**, each** patient received 3 g of the drug**.'**

any: This is handy to allow you to use the singular and to include zero. **Any = 0 → ∞.** For instance, 'We sought correlations between age and enzyme X levels. (They surely existed.) We sought any correlation between age and enzyme X level.' (Maybe non-existent.)

chance vs. change: Despite sounding very similar, these are very different words. Be careful regarding which one you. 'Their first **chance to change X** will be in 2009.'

chapter: Finns use this for almost everything, but 'chapters' are reserved for books. Wrong choices are extremely confusing.

- **paragraph =** an often-indented unit usually covering one major point.
- **section =** such as Introduction, Methods, Results, Discussion.
- **chapter =** a long portion of a book, comprising many pages. (*Moby Dick*!)

contrary to: This is often overused. '**On the contrary**" (French influence, *au contraire*?) is argumentative. Instead, use **Contrary to** X is Y' or '**In contrast**, X seems preferable.' Alternatively, you may use '**Conversely**, our mice survived X' or 'We chose **the opposite.' 'The reverse** is true**.'**

control: (*säätää ohjata*) Use monitor / check / follow(-up) (*valvoa, tarkistaa, seurata*). 'ConTROL' (stress on the 2nd syllable) conjures hand-cuffs, ropes, dog-leashes, and tempers, and in research has a very specific meaning. Doctors **monitor** patients, **follow** them in a follow-up study, **check** them. But, control also refers to an untreated / unaltered subject compared to one undergoing an intervention.

different: Avoid over-use; all things differ. Why use 'Six different men shared a ward'? Perhaps to stress wide differences, 'Six widely **differing** viral species thrived.' '**Differ**' is a good, strong verb: 'These patient populations **differed** in ethnicity.'

economical: 'Economic' has to do with the economy. 'Economical' is rare and suggests saving money (*säästäväinen*) or cost-efficient. An ecoNOMic**al** person eCONomises.

effect and affect: '**EfFECT'** is almost always a **noun** and '**afFECT,'** a **verb**. '**We affect its effects**.' The rare noun '**a**ffect' refers to emotions. 'He is lacking in affect.' The rare verb **'efFECT'** means to establish. 'We hope to effect changes here!'

gold standard: Never 'golden standard,' as this is **monetary**—££, $$. It is a **metaphor** contrasting a nation's gold reserves with silver reserves. More usual in medicine is '**X of choice**' as in '**Treatment of choice**'?

health vs. healthy: She is **healthy** (adjective)**. She is in** good **health** (noun).

increase, decrease: These apply only during a **specified time-period.** They may occur '**from inside**,' on their own, as in a lesion healing, versus—from outside—being cured. **Occurring within**: 'His pain increased.' 'Values increased / rose / soared.' 'Levels decreased / fell / dropped / deteriorated.' (See Verbs section.) **By outside forces**: 'Aspirin reduced/raised / elevated / enhanced / promoted / X.' Or it '**reduced / lowered / diminished / X**.' Or 'Y caused a decrease in X.' Or is X merely 'higher / lower' or 'larger/ smaller' than is Y? 'As the length of the neonates **decreases**, their relative heart weight grows.' (Babies shrink?) Accurate: 'The **shorter** the baby at birth, the greater (is) its relative heart weight.' Never write 'When mountains **increase** in size, their number of species rises.' Write 'The **larger** the mountain, the greater (is) its number of species.'

incidence (vs. prevalence): Gustavii calls these 'the total number of cases of a disease or condition existing at a specific time' vs. 'the number of new cases that develop over a specific time,' **Prevalence = how many now have X disease. '**Prevalence is 213 / 100 000**.' Incidence = how many develop it annually. '**16.3 /100 000 develop it annually**.'**

in print, in press: '**In print**' means **being sold**; '**out of print**' means **sold out**, unavailable. **In press** is more useful to authors—means now being printed, soon to appear, or (mainly non-academically) '**forthcoming**.' No phrase "out of press" exists.

keep vs. give: '~~I will **keep** a talk.~~" No! You will do the opposite: 'I will **give** a talk.' But we do '**hold** a meeting / a conference'; we '**give—**or **throw—**a party.'

lend vs. borrow: Lend goes out—**from** you; **borrow** comes **to** you.

next: Near a day**,** we say**, '**See you **this coming** Monday.**' 'Next** Monday?**'** In 10 days?

other: '**On the one hand,** and **on the other hand**,' doubles contrast strength and is okay, but never use 'other hand' twice to refer to two related items. Dangerously confusing. Also, do note use 'The other patient lost weight, and the other gained weight.' Write '**One** patient lost weight, and **the other** gained (weight)**.'**

own: Always preceded by a **genitive:** '**her / his / Oulu's / their own X**.'

parameter: This is overused and mispronounced. Say 'pa**RA**meter' (not 'pair of meters') and reserve it for mathematically derived values like means, confidence intervals (CIs), standard deviations (SDs), or constants. Instead, use '**characteristics / variables / measurements**.' Similarly, avoid '**paradigm**,' sounding like 'pair of dimes.' Model? Pattern? Ideal? Unless you are specifically referring to a paradigm shift.

range: From smallest to largest figure, use '**range / ranging.**' **'**His temperature ranged from 36 to 40 C. Prevalence, ranging from 20 to 30/100 000, is sure to rise.' (See 'vary' below.)

risk: Most academics seem to prefer '**at risk for X**' (X is something not inevitable), rather than 'risk of,' which laypersons prefer. We can then write 'The **risk of** over-eating **for** obesity.' But always '**risk of death**,' an inevitable thing.

significant: Unless you have no p values in your manuscript, use significant **only for a statistical difference** (p value), not for achievements or for human relationships. Many **drop** '**statistically**' after using it once, unless '**clinically** significant' is relevant. Avoid 'almost / highly significant.' Instead, give the p value. (See Handling Numerals, Numbers and Other Small Items below.)

similar, same, identical: These words are **not interchangeable**. 'Same' and 'identical' are more similar than is 'similar.' Brothers and sisters are **similar**, but only **identical** twins, being monozygotic, are genetically exactly the same.

since, as, while: Beware! Each of these can also have a **time-sense.** '**Since / As** he came to live here, he has been studying Finnish.' (Because, or in 2001?) '**Since / As / While** I am busy in surgery, you look after our family.' (Huh?) (For '**since**' and for '**as,**' we therefore **often substitute** '**because.**') 'X accumulated in the nucleus, **while** tabulin was cytoplasmic' means **whereas or when**? (For any '**while**' not meaning '**at the same time as**' please s**ubstitute** '**but**' or '**whereas**.')

vary: Less often appropriate than 'range,' discussed above. 'Vary' means to go up and down. 'The patient's temperature varied hour by hour.' Often it includes no figures.

weigh vs. weight: 'We **weighed** (verb) the neonate. Because her **weight** (noun) was only 1000 g, her mother felt **weighted** (participle) down with fear. The Mafia gang **weighted** (verb) the corpse with rocks before throwing it overboard.'

worth x; worthy of x: In English, we write: 'That **is worth studying**,' or, more formally, 'That **is worthY of study**.'

Confusing plurals: A number of words have unusual singular or plural forms. For these, you simple need to learn them.

Unusually, the **longer form** is the **singular:**

- **criterion** / **criteria**;
- **phenomenon** / **phenomena**.

Two words, **species** and **series**, serve **either** as singular or plural: 'Aho's two series **are** larger than **is** our first series.' 'One species **occurs** here, but **five** species **occur** in Sweden.'

Several words are **never** plural: equipment~~**s**~~, advice~~**s**~~, information~~**s**~~. Unless you are using it as a verb (to research X), avoid using research**es**.

WRITING MECHANICS

This section focuses on what we call writing mechanics, issues such as article use, punctuation, prepositions, and other issues.

Prepositions

Prepositions consist of words like *by, with, in, behind, on, at, to, until, over, beside.* Two or three words can be combined to make a preposition, as in *away from, next to, over there, in front of, on top of.* Prepositions can be divided into prepositions of **movement**, **place** and **time**.

Prepositions of movement describe movement or action and follow a verb of movement like *climb, fly, jump, jog.*

- They **climbed over** the wall **into** the garden.
- The dog **ran away from** its owner and **jumped through** a window.
- She **walked along** the road **past** the factory.

Prepositions of place describe where something or someone is, and follow a verb like *be, stand, lie, sit.*

- There**'s** a lamp **behind** the chair, **in** the corner.
- There **are** three cows **on top of** that hill, sleeping **under** a tree.
- She said she **put** it **over there**, **on** the table.

Prepositions of time (in, at, on, until/till, by, during, for) describe when something happens.
Use **IN**:

- with parts of the day, e.g. I usually watch TV **in** the evening.
- with months, seasons, years, centuries, e.g. He was born **in** the 19th century - **in** 1892, to be precise.
- to say how soon something will happen, e.g. I'll see you **in** three days.

Use **AT**:

- with exact times, e.g. I went to bed **at** 11.30.
- with holidays/religious festivals, e.g. I see my parents **at** Christmas.
- **at** night, **at** the beginning and **at** the end. British English: **at** the weekend.

Use **ON**:

- with days: e.g. I finish work early **on** Fridays.
- with dates e.g. The course finishes **on** 14th April.
- American English: **on** the weekend.

Words collocate with other words. When you read academic texts in English, note not only the prepositions used, but also the words around them. Usually the preceding words are the ones that link with them most closely, but occasionally the following words are more important. Learn expressions that appear frequently in the literature of your particular field.

Some examples found in texts in the fields of agriculture, nutrition, marketing and education:

...a seasonal **dependence on** habitats ...
...a **criterion for** injury …
...it was **deficient in** ...which is **essential for** growth ...
...both 1 and 2 were **reduced in** deficiency ...
...**studies on** microbiology have **focused on** ...
...the third study was **designed to build on** the classifications ...
...we will **build upon** the review **presented in** Chapter 4...
...this is **important for** growth and **in** blood clotting ...
...**available for assimilation by** ...
...**assimilated into** biomass ...
...the **value of** field markets ...
...values have been **corrected for** ...
...**variation in** cold hardiness ...
...**attributed to** the amino acids ...
...it was **designed to** assess ...
...it **begins with** a product ...
...**combined with** an **increase in** ...
...**based on** facts ...
...**concerned with approaches to**...
...the **effects of** background music **on** shoppers ...
...he **adds to** this view **by identifying** reading processes ...

A Sampling of Preposition Problems: The following includes a catalogue of problems often accompanying the use of prepositions, where we provide the proper phrasing and, where appropriate, incorrect uses.

absent ***from*** ***(***but, an addition ***of*** sodium)
added ***to*** (not ***into***)
agree / disagree ***with***
apply ***for*** (but apply ointment; apply ***to*** the university ***for*** money)
approve / disapprove ***of***
associate ***with*** (correlate / consistent ***with***, but relate ***to***)
at this level ***of*** (use ***at*** for measured points: point, age, temperature, stage…)
on average
characteristic ***of***
compare ***with*** = make a comparison
compare ***to*** = liken to (John was tall, compared *to* his father)
in connection ***with***
introduce ***to***
different ***from*** (US error: different ***than***; UK error: different ***to***)
dissolved ***in*** (but extracted ***from***)
the effect / influence ***of***
essential ***to***
exclusive ***of***
fill ***in*** (US: also fill ***out*** a form; complete a form)
foreign ***to***
grateful ***to*** you ***for*** your help
increase ***in***
independent ***of*** (but dependent ***on***)
isolate ***from***
at a mean height / weight / level
participate ***in***
prefer X ***to*** Y
prior ***to***
pursuit ***of***
in the range ***of***
in the ratio ***of*** a to b
refer ***to***

representative ***of***
similar ***to***
substitution of X ***for*** Y
varies ***with***

Prepositions before figures require prepositions between such figures, e.g. ***between*** two ***and*** ten; ***from*** two ***to*** ten, but not always in parentheses, e.g. (ages 45–50).

An excellent source of help with prepositions is the Collins COBUILD Advanced Learner's English Dictionary (4th Edition. London: Harper Collins Publishers). Further details can be found at http://www.cobuild.collins.co.uk. The free online Cambridge Dictionary is also very helpful with prepositions. Further guidance on prepositions of time can be found at http://www.englishclub.com/grammar/prepositions-at-in-on-time.htm.

Participle Problems

'**Using'** often dangles: e.g. The thieves were caught using the latest technology. '**Used**' is vague and weak, especially when "used" is the passive verb at sentence-end. (See Process Writing section.) Change 'using' to '**with**' or '**by**'. For example, 'w**ith**' an instrument, or a substance (As the instrument gets more complex and more automatic, however, one can use '**by**'). Alternatively, use by a method or technique, or a complex instrument (even '**by means of**' or '**by use of**' something).

'The patients were warmed **with** blankets.' '**By** this method, we succeeded.'

'Results were calculated not **by** computer, but **with** a slide rule.'

'**Using**' is okay **with an agent**: 'Aho, using X, did Y,' even 'These cells, using sodium as a—'.'Using" can also serve as a **substantive**, called a **gerund,** as in 'Swimming is good exercise.'

Be careful with all participles ending in '-ing.' These may become '**dangling modifiers**.' Native English-speakers often joke with them.

'Lying across the colon, the surgeon saw the lost dressing.'

'Hanging from the ceiling, the elderly nurse suddenly noticed an electrical cable.'

Repair both by flipping them so that the modifying phrase comes last, next to what it modifies. Thus, 'The surgeon saw the suture lying ….' and 'The nurse noticed a cable hanging….'

As with subject and its verb:

Put things that go together close together.

Article-Use Guidelines

For most non-native English speaks, using articles (a / an / the) poses problems, even amongst those who are fluent or near-native English speakers. Below, we provide a few guidelines to help you.

Choosing the right article: a / an / the / no article. The following general rules will help you to decide whether a noun needs to be accompanied by a definite or an indefinite article.

- **Is the noun the name of a person, a country or a city?** Most names of things and people do not take an article. e.g. I work in Helsinki. (There are exceptions, e.g. I visited the United States last summer; The Italians are crazy about football).

- **Are you talking about a particular (definite) thing or a general (indefinite) thing?** Particular things will often take definite articles. e.g. This book is about the plants you can find in Finland. This book is about plants.

- **Is the noun countable or uncountable here?** Uncountable nouns, when used in a **general** sense, do not have an article. e.g. Babies need milk. Milk is an important source of nutrients.

- **Is the noun singular or plural?** Singular, countable nouns must have an article or a word such as *my*, *this* and so on. Plural nouns, when used in a **general** sense, have no article. That's my file. / I hate this book. Farmers in Spain have higher incomes than they did before they joined the EU.

- **Is it new information or old information that has been mentioned before?** New information often has an **indefinite** article, but things that have been mentioned before often have a **definite** article. e.g. John has a son and a daughter. The son is a student at the University of Helsinki.

- **Is the thing referred to unique?** The definite article is used before some words which imply that *X* is unique. e.g. They are all good players, but Jane is the best. When is the next train to Helsinki?

Rule of thumb: Usually 'the' means 1 of 1; 'a / an' means 1 of >1.

Special cases: Take note of the following special cases which may or may not require an article.

- **Body organs**—the heart, the liver, the brain, the arm, **the** kidney**s, the** bone**s.**

- **Institutions and organisations**—the Finnish Academy, the FCS, but Oulu University, and words unmodified: the sick, the old, and the former, the latter; the elderly, the blind. Note that for most organisations, once abbreviated, they do not take an article.

- **No articles for**: biology, birth, both, childhood, death, fifteen, history, Ireland, June, malaria, midnight, Monday, noon, oxygen, pregnancy, winter, youth, Table 1, Figure 3.

- **Articles with a verb**: **commit** suicide / murder, always without 'the.' **Murder** is a **verb; suicide** is **not.**

- **None in addresses**: Department of Art, University of Texas; Joan Aho, Editor

- **No articles for** above sea level, below zero, by accident, at once, at present, in case, by chance, in addition, in brief, in contrast, in detail, in effect, in full, in fact, on time, on purpose, within reach, beyond reach, without doubt, without warning

Many singular nouns need no article. Judge them **by ear** by creating a simple sentence:
'Incidence is rising.' 'Nature can heal a patient.' 'Treatment cured her.'
But 'THE study / patient / dose was—' Can you hear whether an article is usual?

Exercise #5.A: The / A / An?

In the text that follows, decide if an article is needed and, if so, which one.

Much has been learned about ____ brain in ___ last 150 years. ___ brain, ___ most complicated organ of ___ body, contains ___ ten billion nerve cells and is divided into ___ two cerebral hemispheres – one on ___ right and one on ___ left. Interestingly, ___ left hemisphere controls ___ movements on ___ right side of ___ body, while ___ right hemisphere controls ___ movements on ___ left.

___ researchers also know that ___ specific abilities and behaviours are localized; in ___ other words, they are controlled by ___ specific areas of ___ brain. ___ language, it seems, is highly localized in ___ left hemisphere. In ___ 1860s Dr. Paul Broca discovered that ___ damage to ___ front left part of ___ brain resulted in ___ telegraphic speech similar to that of young children. Soon thereafter, Karl Wernicke found that ___ damage to ___ back left part of ___ brain resulted in ___ speech with ___ little semantic meaning. These two regions in ___ brain are now referred to as ___ Broca's area and ___ Wernicke's area.

Although there is some debate surrounding ___ specialization of ___ brain, ___ researchers generally agree that___speech is controlled by ___ left side. There is no debate that in ___ great majority of cases, ___ injuries to ___ left side nearly always have ___ impact on ___ speech.

Exercise #5.B: Article or no article?

In the following, decided if an article is necessary or not.

1. Figure 3.11 shows a representative set of results from an experiment using _____ **flame-aversion paradigm.**
2. For the better part of a century, _____ **professional philosophy** has been out to "naturalise" mental phenomena by reducing them to physical entities and/or relationships.
3. He compiled a chronicle of _____ **world history**, fitting together the calculations of Greek chroniclers with the indications of date found in the Bible.
4. 'There is a real possibility of affecting _____ **ageing process** with biomedical intervention.'
5. Aspects of _____ **Irish constitution** and its implementation are clearly oppressive as well as offensive to other minorities beside the Protestant one.
6. Members of the working party agreed that some use of animals in _____ **biomedical research** is necessary.
7. The radical restructuring of _____ **British politics** after 1931 lies not in the events of 13th-28th August but in the changing attitudes within the National Government during September and October 1931.
8. As stars move, _____ **Doppler effect** changes the wavelength of the radiation they emit.

9. Ever since _____ **Industrial Revolution** created a mass urban society, the conditions of the poorest city dwellers has given rise to anxiety among the better-off.
10. The theory of natural selection first propounded by Charles Darwin (1958) is a cornerstone of _____ **biological thought**.
11. The main models of _____ **British economy** vary widely in attributing importance to the link between wealth and current spending.
12. In the past, attempts to root out _____ **police corruption** have been hampered by officers' reluctance to accuse their colleagues of wrong-doing.
13. In the early 1980s, at a time when _____ **manufacturing industry** was collapsing and the outlook for the unskilled looked particularly bleak, frustration boiled over in a series of riots in London, Bristol, Birmingham, Liverpool, and elsewhere.

Punctuation in English

The following constitute the most common types of punctuation you will encounter in English?

full stop (British) / period (American)	.
comma	,
semi-colon	;
colon	:
quotation marks (double quotation marks)	“ ” or " "
inverted commas (single quotation marks)	‘ ’ or ' '
apostrophe	’ or '
hyphen	-
en-dash / em-dash	– / —
brackets (British) parentheses (American and more formal British)	( )
square brackets	[ ]
question mark	?
exclamation mark	!
ellipsis	…
slash	/
‘at’	@
asterisk	*
superscript	soon^{15}
subscript	H_2O

For a more complete list of punctuation and detailed explanation of use, go to http://en.wikipedia.org/wiki/Punctuation.

Here, we briefly summarise the key uses for each type of punctuation marks. Several key references are listed in the resources and references section which provide richer, more detailed instructions on the use of punctuation.

Full stops / periods: These occur at the end of a sentence. They are sometimes underused. Chop some of your long sentences down, removing commas and replacing them with full stops. As a general rule, sentences should not exceed 30 words in length.

Commas: The Finnish pattern is verb + , + että, but in English you do not need a comma there. For example:

- Results **show that** a saline solution is needed.
- It was **decided that** further experimentation was necessary.

A comma usually follows an **introductory word** or expression or clause.

- However, our research indicates...
- In spite of this, we decided...
- When we consider all the factors involved, it is obvious that...

Pairs of commas go around phrases or clauses that are **non-restrictive**. These commas are omitted if the phrase or clause is **restrictive**, or essential to the meaning of the sentence. Confusing these types of clause can lead to ambiguity.

Non-restrictive	Restrictive
The X test kits, **which** we ordered from Helsinki, performed best. (Here the fact that they were ordered from Helsinki is simply additional information. There is no comparison with test kits from other places).	The X test kits **that** we ordered from Helsinki performed best. We will therefore no longer order from any other source. (Here we are defining which test kits we are talking about, so it is a restrictive clause).

When two **independent clauses** are connected by 'and', the sentence is often easier to read if 'and' is preceded by a comma:

- The crops were devastated by hordes of rats**,** and birds consumed all of the berries. (If there is no comma after rats, we read it first as if rats and birds together destroyed the crops, so the verb "consumed" surprises us).

The American way of putting a comma before the 'and' at the end of a list (called a **serial comma**) can sometimes remove ambiguity:

- This was demonstrated in foxes, cats, rats and mice, and squirrels. (The comma makes it clear that rats and mice are in one category).

The following table provides a summary of the chief uses of commas.

TYPE OF COMMA	PROBLEMS	EXAMPLES
Serial comma	Final comma before 'and' (Oxford or Harvard comma) Often comma before 'or'	a, b, c, and d a, b, c, or d
'Foetal parentheses' (always paired)	A commenting or a defining unit?	Doctors __who constantly overwork__ need higher pay. The timer__which broke__ will never work. (Test these two, with and without commas.)
(Subject + verb) and, or, but (subject + verb)	Clarity	Loss of signal correlates with concentration of contrast agent and relative blood volume is calculated by the X method. (Why must we read this sentence twice?)
Introductory word or phrase	Does an oral pause follow?	First, tell me…. Finally, finished reports arrived. In May, is the test complete?
Dependent clause (always use if initial)	Is the clause dependent?	Whereas 251 cooperated, 17 withdrew. If you wish, the doctor will call.
Adjective series	A comma goes where 'and' could appear.	It is a tall, broad, dark oak tree. The fit, lean Arab patients survived.
Apposition (paired)	Identical, not defining	Paula, our director, arrived. But: Our director Paula arrived.

Semi-colons: Use these to **bind two sentences** where a full stop seems to give too long a pause and a comma not long enough. They are often used to link **closely related but independent clauses**, allowing for a dramatic pause. They often replace a conjunction such as *and* or *but*.

- This may be proved by future experimentation; on the other hand, it may not.

Colons: Colons introduce announcements or lists, and can mean viz. or namely:

- These three points are: 1)…, 2)…, 3)….
- This is what it showed: none of the trees in plot 15...

Ratios contain colons and are read as 'to': (1:1, 3:5:9, Cu:Zn).

Colons are also used to introduce an independent part of a sentence which follows the main part or explains it:

- He ran across the bridge: she was no longer there.
- We have come to a decision: we must sell the company.
- This is the issue: Can an employee be dismissed simply for belonging to a union?

Quotation marks: Quotations need to be indicated, and you may find slight differences in their use depending on US or UK English style guidelines. Use double quotation marks (" ") when you are directly quoting text or speech. Use single quotation marks (' ') for a quotation enclosed inside another quotation. Final commas and full stops are written **inside** the final quotation mark, but other punctuation (: ; ! ?) inside or out. For further information on quotation marks and associated punctuation see http://owl.english.purdue.edu/handouts/grammar/g_quote.html.

Apostrophes: These are often used inaccurately by native speakers of English. An apostrophe generally shows the **genitive**:

- Smith's research / Jones's ideas (singular)
- Children's pets / the people's choice / the Smiths' house / the Joneses' (plural)

Be careful with **it's / its:**

- 'It's fur' means 'It is fur.'
- 'Its fur' (no apostrophe) means the fur belonging to it (a cat, dog, etc.).

The apostrophe can also be used elsewhere to show a missing letter: **don't, shouldn't, can't** → can not. You should avoid such contractions in academic writing, however.

It can be used with numerals and letters to indicate the plural (They were marked with 5's and 6's. How many VIP's are coming?), and when writing decades (In the 1930's). However, the current tendency is to omit the apostrophe in these cases.

Hyphens: A hyphen can join two parts of a name: Eeva-Liisa Suominen-Laakso. Hyphens can also link parts of **stacked pre-modifiers** (which are things to avoid!):

Silica gel coated glass fibre paper chromatography → silica-gel-coated glass-fibre paper chromatography
Six-year-old horses are six years old but may not act like six-year-olds

Ambiguity can occur:

No smoking tables available.

Are there no tables where you can smoke? Or are there certain tables where you can't smoke? If it is the latter, write: No-smoking tables available.

Dashes: The '**em dash**'—like the ones around these seven words—is the width of the letter 'm.' Dashes create a **gasp-like sudden break**. In formal writing, I would avoid using more than one or two pairs of dashes per article. 'We prescribed Marevan, Emconcor—both low in price—and two expensive antibiotics.' An em dash can be used in a pair or singularly. **'**Her drug is inexpensive**—w**arfarin.'

Note: Computers can **make a dash** from no spaces and two hyphens (--). Type those, and without adding a space, type any letter and then a space. The two hyphens join to make a dash.

An **intermediate-length dash**, the 'en-dash,' is the width of the letter 'n,' and often connects adjective pairs ('The calcium–sodium combination'), time periods ('the period May–July'), or ranges ('10–26 years').

For a comprehensive and amusing guide to all things punctuation-related, I highly recommend Lynne Truss's best-selling book, ***Eats, Shoots and Leaves*.)**

Exercise #6.A: Punctuation

Howard Becker, in *Writing for Social Scientists*, U Chicago, 1986, describes one sort of process-organisation which parallels Process Writing. His wise advice allows your ideas—before you start with any sentences—easily to fall into place. This makes organisation far simpler.

Add all punctuation marks. In some places, up to four or five marks will serve.

An academic text often follows this standard pattern abstract introduction materials and methods results and discussion called IMRAD begin by writing down everything that could possibly go into the article spew out fragments of ideas as fast as you can these fragments which will range from specific to very general can now be arranged so that they move logically from point to point do this the easy way copy each fragment whether it happens to be a theory a reference source statistics an observation an argument or a question onto one file card put these cards into piles according to pure intuition and logic will tell you which fragments belong together each pile then gets a label on top meaning a card giving a statement summarizing the contents of all cards in that pile if cards do not fit put them elsewhere or into their own new pile next spread out the general summary cards on the floor and examine them to see if they make some sort of flow-chart if they do you will have one way to organize your paper but remember there is no “one right way” to do something aim for one of the many good ways.

Exercise #6.B: Punctuation

All punctuation in this passage is absent, except for two full-stops (periods) after the two paragraphs. Punctuate it. In some locations, three or four options will each be suitable.

Non-native English speakers find that rules governing the use of articles are particularly tough to negotiate in technical contexts a common error that an editor may encounter in medical papers is omission of articles before the names of body parts the rule is simple and easy to follow the definite article the should precede the names of body parts such as the heart or the lungs when the names of body parts are provided in a list however an article is necessary only after the first name such as in the heart lungs and brain.

Appropriate capitalization for terms that have been derived from proper nouns is a controversial topic editors are unsure whether to capitalize Petri dish and Gram stain the popular rationale is that terms derived from proper nouns should be in lower case the adjectival form whereas terms should be capitalised for the proper noun itself thus Gram stain vs. gram positive bacteria, and parkinsonian gait graafian follicle and luciferase we do capitalize Southern blotting the technique discovered by Edward Southern who was born ironically in northwest England northern and western blots are in lower case being based merely on the naming of the Southern blot.

Heavily adapted from "Common errors to look out for in medical papers," Nikhil Pinto, *European Science Editing*, Vol. 39, No. 3, August 2013, p. 69.

Handling Numerals, Numbers, and Other Small Items

Numbers:

1. Check your target publication for its preferred style.

2. Generally, **write numbers** as **words for items with no units** (patients, treatments) **up to 11**. **Use number figures from one / 1 and thereafter** for items with standard units (ml, mg, km). (But always per day, per week.) **Avoid mixing words and numerals** for the **same** item in the **same sentence**. 'Of the 81 countries, only ~~eight~~ 8 sent athletes'. Use **ordinals** up **through ten** ("first . . . to tenth, then 11th. . . 160th, 161st, 163rd").

3. **For numbers with unit symbols** (kg, m, or C or the percentage sign, %), if you write out a number under 11, write out the unit, as well (6 kg, six kilograms). Note British: 'six **per cent**,' but USA: 'six **percent**.'

4. **Never add a space between number and percentage sign**: '**6%**,' **never** '~~**6 %**~~.' **Insert** a space before **any amount:** '3 mg; 10 K.' One oddity can be found in '120 mmHg.'

5. **Use numerals for figures and tables** and never add an article or a period / full stop. 'Figure 3 is attached,' **not** '~~the~~ Figure 3 is attached.' In the actual caption: 'Fig. 3. Costs for Health Care, 2000–2008 in Finland.' Some journals use Roman numerals (I, II, III) for article figures, so check the style guidelines carefully for your target publication.

6. For **dates**, '**14 May 2012**' is preferable. US non-scientists use 'May 2, 1998,' which is confusing when abbreviated in **US style** as '**5/2/98**': is it **February 5 or May 2**?

7. **Never begin a sentence with a numeral** (except in *Lancet*). A short word ('Six / Ten studies') is acceptable. Otherwise, rearrange the sentence to start with the magic preposition '**Of**,' or link related sentences with a semicolon.

> **32** of the 76 men attended' → **'**Of the 76 men, 32 attended.
> A few are gone; 158 are left.
> In total, 21 men…
> The year 1939 saw the start of war.

8. **The decimal in English texts** is a **point** (**5.75**). This point may be raised in some **British** texts (**5·75**). In other European countries, like in Finland, the comma (5,75) is acceptable.

9. Always use a **zero before a decimal point** (0.21). Again, however, some journals use no zero here in text / figures. Or they drop the zero only in p values.

10. **A decimal rule**. Show values under 0.01 to only two decimal places. From 0.01 to 0.001, show values to only three decimal places.

11. **Large numbers. Group your digits into trios** (12 345 000), with **spaces and no periods.** Or**,** in the older style**, insert commas** (12,345,000) between trios. We usually insert no space into four figures, unless they appear in a column or are in comparison with larger figures ('We sent 1511. But 'We sent 1 511, not 15 120'). For dates, however, we use 1066, 1998, but 'It appeared 60 000 BP (Before Present). AD (Anno Domini) precedes the year; BC (Before Christ) and BP follow it.

12. **P values.** Check each journal's preference for the symbol p / P or *p* / *P*, as well as for which symbols should be used for p values (= or <, etc.). Gustavii says that because p > 0.05 means 'unpublishable,' give exact p values (p = rather than p <) for values above 0.001, using 'p <' only for 0.001 or less.

13. We have **no plural word** for per cent. Thus, use 'percentages'. Usually 'days,' 'weeks,' and 'months' should be written out as words.

14. **Ratios** can be written as 10:1, to mean 'per' or 10 to 1. We can separate items as 'per' with a forward slash, as in 'cases/year,' but some advise never placing more than one slash in a series (not '~~cases/year/country~~,' but 'cases/year per country').

15. Use **spaces** around symbols (=, -, +, ±, < , >, and p). Check journal for style preferences.

16. Use **one unit of measurement**. Do not give length in centimetres, width in millimetres, and height in metres!

17. Journals want **footnote numbers** to follow all punctuation marks (… and Smith,[3]…said that she applied.[6])

18. Always state (vital for **credibility**) the **total number of items** in your data, N, then n for subgroups. Put any percentages into parentheses. Remember: The **shorter item** goes into parentheses, and never separate a percentage from its figure (not '~~45 of the 60 (75%) died.~~' Change to 'Of the 60, 45 (75%) died.'

> 'The **63 (17%)** who died…'
> Writing merely '17% died' would mean little. 17% of what? 10? 100? Or 1000?

19. **Prepositions before numbers** require 'and' or prepositions between figures ('Between two and ten men in from 16 to 18 days….'). In text, use 'to' for ranges of numbers. In text, I prefer 'aged 40 **to** 50,' but you can **omit 'to' in parentheses or in tables / figures. (**'Men were older (40–50).' In a table, 'Men, 21–65.')

20. Gustavii suggests that for numbers under 25, offer no percentages at all. While Hall (1998) feels that for numbers under 100, no percentages are relevant. Whichever you choose, be consistent throughout your manuscript.

> At 25 to 100, no decimal (7%)
> At 100 to 100 000, one decimal place (7.2%).
> Above that, two places (7.21%).

21. For **numerals** or words and their **units of measure**, **hyphenate** ('a 6-ml sample' or 'six-part sessions'). A confusing '4 4-mg doses' is clarified as 'four 4-mg doses.' Use a singular verb for a quantity considered one unit: '3 ml was best.'

22. **Suppliers of materials**. Use the manufacturer's name and address at first mention, then only the name. Include company, then city + country, or city + state + country or city + province + country. But omit "USA" in articles for US journals.

> '(Smart System Oy, Turku, Finland),' then only '(Smart System).'
> '(Sigma Chemicals, Inc., St. Louis, MO, USA)," then only "(Sigma).'

23. Do not use **'and/or'.** Write 'A **or** B **or both**.'

24. The use of **'respectively'** should be minimised at all costs. That is, avoid 'Levels in the heart, brain, and liver were 11, 21, and 28%, respectively' or '… were a respective 11%, 21%, and 28%.' Instead, write a version two words longer, **but far easier to read**. Note how the **number of words per item decreases**—here, from five to four to three. But if you must use several sets of the same pattern 'A, B, and C were 1, 2, and 3,' use 'respective / respectively' only **once**—for the first set. Readers grasp the pattern!

> **'The level in the heart was 11%, in the brain, 21%, and the liver, 28%.'**

25. Remember: use **italics for book and journal titles; quotation marks** are for titles of **shorter** works, meaning articles, chapters, sections, stories, plays, poems. **Italics** also, **always**, indicate Latin **genera and species**: *Helicobacter pylorus.* Italics are, however, expensive and difficult to use consistently. If you use any, you must use them for **all Latin terms and all foreign words**: *i.e. / e.g. / et al. / in vivo / laissez-faire*. Check whether your target journal uses italics.

26. **Latin abbreviations.** Finns use **i.e.** (*id est*; that is; Finnish *eli*) well, but greatly overuse **e.g.** (*exempli gratia*; for example / for instance; Finnish *esim*). E.g. is correct only for an example following the name of the group it belongs to. Commas normally go before, often after e.g. and i.e., just as in 'X, for example, won.' Never, therefore, begin a sentence with 'e.g.' ('~~E.g., malaria was common~~'). Nor should you begin a citation with 'e.g.' ('~~e.g., Smith 2005~~'). Use instead, 'for example / for instance / such as' or create an **open series.** The absence of '**and**' or '**or**' shows that these do not make up 100%.

> **'Our leader, i.e., the director** of the study, arrived early.'
>
> 'Large countries—**e.g., France and Germany**—'
>
> 'Symptoms of concussion (**headache, nausea, dizziness**) may occur.'

27. **Etcetera** / **etc.** is too informal for articles or theses. Avoid using it by rewording open series lists.

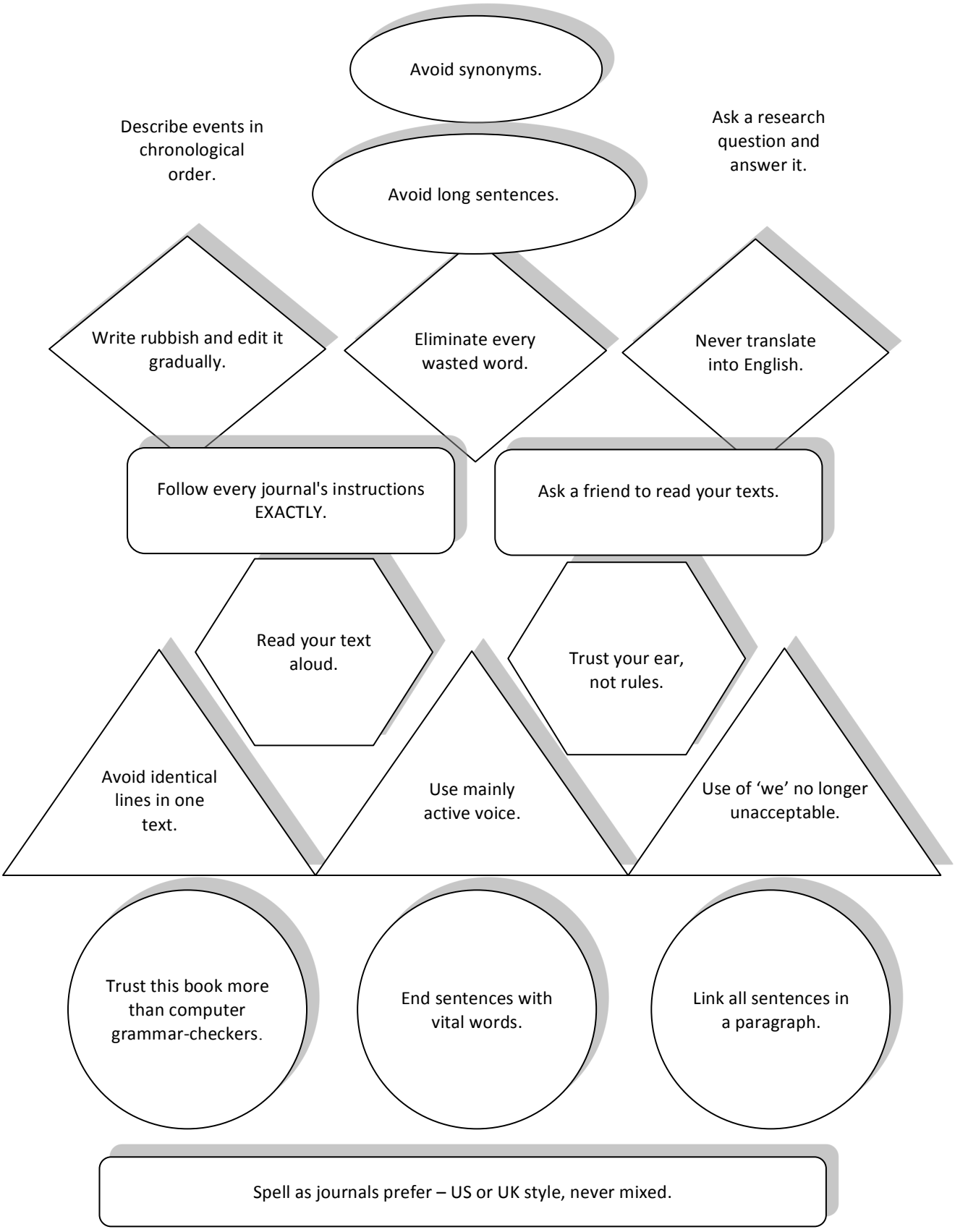
28. **Avoid sexism**. Instead of 'Everyone took his dose' (or the ungrammatical 'Everyone took their dose') or 'took **his** / **her** dose,' try the plural: '**All** took **their** doses.' Should you avoid the genitive entirely? You could use the following: 'Every**one** took **the** required dose.' '**Each** took the dose.' Rather than 'found in **Man** / **man**,' write 'found in **human beings / humans**.' '**Female'** is fine **as an ADJECTIVE, but avoid it as a NOUN**. '**Female patients**' is fine, but if over age 17, 'females' are 'women.' The same goes for **males vs. male subjects**. And if more than genitals or hormone status is relevant, use '**gender,' not 'sex**.'

29. **Avoid long noun clusters** as pre-modifiers. The American Thoracic Society Publications says that because 'goal is clarity, not brevity,' instead of 'cultured sheep pulmonary artery endothelial cells,' write 'cultures of endothelial cells from the pulmonary artery of sheep.'

Always check and follow the

Information for authors/Submission guidelines!!!

TAKE-HOME MESSAGES



- Be careful. Avoid begging, boasting, or pressuring the editor.
- Keep cover letters brief and cool, because journals need manuscripts.
- On-line submission may, however, require no cover letter.

Standard letter format:

The following provides a template for you to use for the initial submission of your manuscript for publication. You should naturally follow the instructions outlined by the journal to which you are submitting. Should they require specific information or a format, you should follow those instructions precisely.

Sample submission letter format:

1. Recipient's name **title (if applicable)** **university name** **address**	**2. Your address** **telephone** **fax** **e-mail**
4. Reference number or code Write: 'Your ref: 01234'. If you wish to include your own reference, you write: 'My ref: 56789'.	**3. Date** Do not write the date as numbers only, for two reasons: 1. It can be considered too official and therefore impolite 2. All-number dates are written differently in UK English (31/12/13) and US English (12/31/13). This can lead to confusion.
5 Salutation (Dear…)	A letter in English always begins with 'Dear…', even if you do not know the person: • Dear Sir / Madam • Dear Mr / Mrs / Miss / Ms Smith • Dear Dr / Professor Smith
6 Body	The letter itself.
7 Ending (Yours…)	– Yours sincerely – Yours faithfully – Yours truly
8 Your signature	Sign in black or blue ink.
9 Your name	Your first name and surname, for example: – Mary Smith
10 (Your title)	If you are using university headed paper, write your Job Title here (if applicable). If you are using personal paper, write nothing here.
11 Enclosures	Indicate that one or more documents are enclosed by writing 'Enc: 2' (for two documents, for example).

Sample text of a cover letter

Please find enclosed a manuscript entitled 'XXX' which details our latest/on-going/current/recent research into YYY.

The material presented is based on the original research of the authors and is not being offered for publication elsewhere. [Or use the disclaimer provided for authors by the journal on its advice-to-authors page.]

Correspondence regarding this article should be directed to NN at the address above. We / I **look forward** to your reply / We **look forward to** your / We await your response.

Second-Submission Cover Letter after Review

If you need to resubmit an article to a journal, the following may prove useful to you.

> Thank you for considering / taking into consideration our paper / article, entitled 'X in Y.'
>
> The reviewers' / referees' suggestions we feel helped to improve our text / article / presentation.
>
> We have made [Add: 'to the best of our ability'] all of the revisions suggested, and these are explained point by point in / on the following pages / in the accompanying file.
>
> Thank you for your attention / time and consideration. I/We look forward to your response.

You can also compliment the reviewers / referees by calling them 'helpful / wise / thorough,' but never direct your comments to the reviewers; your response goes to the editor's desk.

If a reviewer criticises your English, you must seek native-speaker language aid (again?!).

As well as revision of the re-submitted manuscript, have an expert revise your crucial—and very respectful—responses to the referees.

End the letter with something like 'We hope that you will find this version more acceptable.'

See the Handling Reviewers section below.

Handling Reviewers / Referees and Editors

Before its submission, **three people should read your manuscript** (ms)**: one naive person** who does not know your field, **one who is your scientific equal** (**peer**), and **one expert. All co-authors** should examine the ms carefully and sign the cover letter and all disclaimers. **Never rush to submit**.

After submission, your manuscript **surely will come back with criticism** from the editor and from reviewers / referees. **Almost never is any manuscript accepted without changes**.

Resist any rage or despair; have faith and say to yourself: '**We are all on the same team**.'

In 99% of all cases, everyone at / with the journal is struggling to improve your manuscript.

> **'The most valuable thing you can receive is fair and honest criticism. Invite such criticism, welcome it, utilise it**.
>
> *Karl Popper, philosopher of science*

If after a **rejection** you submit elsewhere, **follow the next target journal's instructions** equally carefully. As Hall says, 'It is **a grave** [as in burying yourself alive] **mistake to submit a paper in the style of another journal**; this suggests that it has been rejected recently.'

Rarely will reviewers ask you to cite their own or the journal's articles just to enhance their reputations or raise that journal's impact factor. Even more **rarely** will a reviewer **hold an ms** for an extraordinarily long time, or—horrible to contemplate—**steal data** from it.

All authors experience shock and shame over criticism. Non-native English-speakers must also decipher **referees' language**. Often even native English-speaker referees / reviewers make grammar ('between

you and I') and spelling errors ('Febuary,' 'libary'). Your **overburdened, unpaid** reviewer may be writing the report at three o'clock in the morning after a very long and tedious day.

Reply directly to the editor and quote each criticism in full or almost completely. Don't expect an editor to search through papers or net files for reviewers' comments in order to understand your responses to each of the comments.

Never attack a reviewer! Take all **blame** upon **yourself. Always be polite** to the editor and polite regarding your reviewers. (On the same team, remember?) **Use correct, formal** English.

Obey, or fully explain why you cannot make a recommended adjustment, if necessary.

> 'Procedure X is not an option / not according to general policy, here.'
>
> 'I must have been unclear: Because we used no X, we can provide no photo of X.'

Reviewers often disagree. Politely explain to the editor why you prefer one opinion to the other. Explain why a reviewer's request is unclear to you.

The editor may then send your manuscript to an **extra reviewer**. Uninformed, prejudiced, or careless reviewers may receive no more manuscripts (mms.) to review.

Permissions and notification

Before you reprint—exactly, or as an adapted / modified table or a figure, or a major portion of one—in your own publication, you must request and receive the **publisher's permission**. You must print in your article or thesis, below the borrowed material, the exact line that the publisher supplies, such as 'Used with the permission of Journal X.'

Cutting very thin the data from one project to produce a maximum number of articles is called **redundant, prior, or fragmented publication**. This '**salami publishing**' means that articles resemble very thinly—too thinly—sliced meat cut from a large chunk. Students and even professor-candidates may **salami publish** to earn degrees or to pad (fatten) their CVs.

To avoid this, one author sent to her editor **a list** of all published articles presenting data from her group's single large project. This showed that her own paper was fresh—that is, had minimal overlap.

Journals usually now **require** that each article submitted be accompanied by reprints or the manuscripts of any of your other articles that overlap with that one, especially texts with data based on **material, methodology, or controls identical to** those of **your current submission**.

Every journal wants fresh, unique data only. Receiving redundant (repeated) data, some journals threaten not only to **reject the manuscript** but also to **inform your institution**. If you fool the journal into printing your redundant data, the editor may announce your sin in their next issue and **refuse to consider future articles** of yours or even of your group or institute. This **blacklisting is serious censure.** Ensure, therefore, that **each manuscript** is **fresh and worthwhile on its own.**

Another crime usually leading to blacklisting is **multiple submission—submitting the same article to more than one publication simultaneously**. Because much effort and cost go into assessing an article, no author can survive withdrawal of a submitted—or even accepted!—ms.

Impact Factors

In The European Association of Science Editors (EASE) *Science Editors' Handbook* section 'Journal impact factor,' Jane Moody, in November 2005, discussed impact factors, developed by the Institute for Scientific Information (ISI) in the 1960s. 'The impact factor (IF) of a journal is calculated by dividing the number of citations in a year by the articles (source items) published in that journal during the previous two years.' Some of the problems that Moody notes:

1. Multiple authors all citing their own articles will affect the impact factor.

2. Impact factor differences are not credible unless differences reach about 22%.

3. Frequent citation may occur because of negative responses to an article, and criticism of it, because 'it is simply quantity that is being measured, not quality.'

4. Review articles are often cited, so the more review articles a journal publishes, the higher its impact factor.

5. The earlier in the year something is published, the longer the time to receive citations.

'Artificial manipulation of the impact factor can be unethical' according to the Committee on Publication Ethics (COPE), at www.publicationethics.org.uk , an organisation established to provide aid regarding authors' and editors' ethics questions and problems.

One editor arranged for that journal's own referees to 'insert citations' of that journal's articles into submitted papers. Authors were afraid to refuse. COPE declared that this 'manipulation had been "wicked practice" [an extremely strong term], and the editor was reprimanded [severely scolded].'

In other cases, editors have agreed to cite each others' journals, gaming the system to raise IF.

If universities or employers rate, hire, pay, giving grants to authors based on IF, they are being naïve. The journal earns—honestly or otherwise—its IF; no single author's article earns an IF.

Gustavii agrees that 'the impact factor ranks journals; it does not evaluate individual papers.' He suggests looking at the 2006 Faculty of 1000 Medicine rating system at http://www.f1000medicine.com, where 2500 top scientists have rated papers regardless of journal. See also the 2002 site for biologists at http://wwwf2000biology.com .

Nature 2013; 497:433–434 published CG Begley's 'Six red flags for suspect work.' As summariaed in *European Science Editing* 2013;39(3):82, by Anna Maria Rossi, these are:

'Were experiments performed blinded?
Were basic experiments repeated?
Were all the results presented?
Were there positive and negative controls?
Were reagents validated?
Were statistical tests appropriate?'

Ask these questions of your papers. And add, 'Is all of the text my own? If not, are others' in quotation marks?'

PLAGIARISM

Customs vary, but in Anglo-American cultures, **using other scholars' exact published lines**—even with citations but with no quotation marks—**is stealing.** The term is **'plagiarism.'**

The style of a text must not bounce back and forth between the author's own writing level and splendid 'Oxbridge' language. That screams 'Plagiarism!'

Although we all describe the views and findings of others, **merely citing the source** '(Smith 1995),' gives you no right to **present Smith's lines** as if they are of **your own creation.** The original author struggled to create those lines and must not meet them in your pages, masquerading as yours. To quote a few lines (between quotation marks, ' ') and with a citation is, however, sophisticated practice and is a compliment to the author.

You no longer own published lines that you yourself have written, if the publisher holds the copyright. Editors thus generally consider self-plagiarism as illegal—against copyright law.

Stuart Handysides, MD, of the European Assoc. of Science Editors (EASE) says, 'Elsewhere [than in Methods] simple cutting and pasting from earlier work might suggest that the writers have stopped thinking about their subject, as the new data should be the prime focus of the discussion and change the context at least somewhat. If not, what was the work for?'

The most **frequent plagiarisers** are writing in English without English as their native tongue. **Paraphrasing** (putting ideas in your words) is, in fact, difficult even for native speakers.

Beware plagiarism—including self-plagiarism—in a thesis summary; etheses travel worldwide. The medical faculty now forbids use of your own lines, tables, or figures there.

- Place quotation marks around all borrowed phrases or lines (quoting).
- Close the book and put the facts into your own words (paraphrasing).
- Give source and write 'says/states/reports,' then quote a bit without ' .' This might, for instance, be a vital, difficult definition of some object or process.

If professors, directors, or language revisers aid you in writing up your work and agree to your submitting a few lines under your own name, this seems ethical. Lines they write with or for you are unpublished. Having **someone write your entire paper** is unethical **ghostwriting**.

Plagiarism can no longer escape detection. Via online tools, reviewers and editors can check whether your words are actually yours. These sites search billions of documents in moments, underlining matching passages**. Many journals now check every submission for plagiarism.**

Medics are not alone in their sins. The Institute of Electrical and Electronics Engineers says that plagiarism in its journals soared from 14 cases in 2004 to 26 in 2005, and in 2006 to 47, thus, annually doubling. The IEEE initiated a tutorial for author-education and crime prevention!

Exercise 7: Plagiarism hunting

This anonymous news item is adapted slightly from *Nature*, number 422, 13 March 2003.

> Emphysema is a lung disease that is predicted to become one of the top five causes of death and disability worldwide by 2020. Cigarette smoking is the greatest risk factor for this disease. Despite this correlation, however, only about 15 to 20% of cigarette smokers develop emphysema. The fact that these susceptible individuals are generally clustered into families hints that there may be certain genes that predispose people to smoking-induced emphysema.
>
> Unlike asthma, in which the flow of air through the lungs is temporarily obstructed, emphysema is characterized by a progressive airflow restriction that results from permanent enlargement of the lungs' peripheral air spaces and loss of lung elasticity.

Here, this anonymous news story is attributed to an author with the invented name 'Thoraksman.' These five passages make use of the *Nature* news item above. Where is plagiarism, and where are the data presented well? Fix the problematic passages so that they are acceptable.

1. Our patient was diagnosed with emphysema, a progressive airflow restriction that results from permanent enlargement of the lungs' peripheral air spaces and loss of lung elasticity (Thoraksman2003).

2. Thoraksman in 2003 considered rather low the 15 to 20% incidence rate for emphysema among cigarette smokers. He warns, however, that emphysema may, by 2020, become one major worldwide cause of disability and death.

3. The figure of '15–20%' for the incidence of emphysema among 'cigarette smokers' seems low to Thoraksman (2003), who continues: 'there may be certain genes [perhaps the X gene?] that predispose people to smoking-induced emphysema' (Thoraksman 2003).

4. Concerning cigarette smokers with emphysema, the fact that these susceptible individuals are generally clustered into families suggests that there may be certain genes that predispose folks to smoking-induced emphysema (Thoraksman 2003).

5. Although pulmonary emphysema, as we read in *Nature*, may 'become one of the top five causes of death and disability worldwide by 2020' (Thoraksman 2003), not everyone believes that heavy cigarette smoking offers a serious risk for emphysema.

Writing and style guidelines and manuals

The following publications have assisted in the creation of this particular course book and to various instructors of this class. Those in bold are particularly useful to me (VF).

Day, Robert A. and Gastel, Barbara. 2006 *How to Write and Publish a Scientific Paper.* 6th ed. Cambridge: Cambridge University Press.

Greene, Anne E. 2013. *Writing Science in Plain English.* Chicago: University of Chicago Press.

Gustavii, Björn, 2012. *How to Prepare a Scientific Doctoral Dissertation Based on Research Articles*. Cambridge: Cambridge University Press.

Gustavii Björn. 2008. *How to Write and Illustrate a Scientific Paper.*2nd ed. Cambridge, New York: Cambridge University Press.

Hall, George M, ed. 1998. *How to Write a Paper*, 2nd ed. London: BMJ Books

O'Connor Maeve. 1999. *Writing Successfully in Science.* London: Chapman and Hall.

Perttunen, J. M. 2000. *The Words Between.* 4th ed. Helsinki: Medical Society Duodecim.

Strunk, Jr., William and White, E.B. 2000. *The Elements of Style*. 4th ed. Upper Saddle River: Pearson Education, Inc.

Swales, John M. and Feak, Christine B. 2012. *Academic Writing for Graduate Students: Essential Tasks and Skills.* 3rd ed. Ann Arbor: University of Michigan Press.

Truss, Lynne. 2006. *Eats, Shoots and Leaves: The Zero Tolerance Approach to Punctuation.* New York: Gotham Books.

Online resources

These Internet-based tools and academic writing websites can help you to improve your writing skills in English.

- Cambridge Advanced Learner's Dictionary (http://www.dictionary.cambridge.org)
- Merriam-Webster Online Dictionary (http://www.m-w.com)
- Dictionary.com (http://dictionary.com)
- Oxford dictionaries (http://www.oed.com)
- Wordsmyth (http://new.wordsmyth.net/)
- Online language dictionaries (http://www.wordreference.com/)
- Wordnet, a lexical database for English (http://wordnet.princeton.edu/)

The Google search engine (http://www.google.com) can also be used as a dictionary. Type in *define* followed by the word you would like a definition for.

Thesauruses:
These are useful when searching for a synonym for a word that you have already used quite frequently. Whilst I would urge you to use a thesaurus cautiously, and always use a dictionary (English only) when using a thesaurus, a good online one can be found at http://www.thesaurus.com.

Resources dealing with academic writing:
Lists of words frequently used in academic writing have been compiled by Averil Coxhead, available at her **Academic Word List** site http://www.victoria.ac.nz/lals/resources/academicwordlist/.

They are also provided in a simple Wiki page together with definitions and pronunciation models at http://simple.wiktionary.org/wiki/Wiktionary:Academic_word_list.

Once you have produced an academic text, try running it through the **AWL Highlighter** at http://www.nottingham.ac.uk/~alzsh3/acvocab/awlhighlighter.htm. The Highlighter marks all those words in your text that appear in the AWL list as well. In other words, your text should have quite a few words in bold face after you have run it through the AWL Highlighter.

The **Academic Phrasebank** developed at the University of Manchester is a general resource for academic writers. It aims to provide you with examples of some of the phraseological 'nuts and bolts' of writing at http://www.phrasebank.manchester.ac.uk/.

Examples of reporting verbs together with their Finnish translations are provided at http://users.tkk.fi/~penningt/basic/summary/reportingvb.html

Online writing centres:
Purdue University's Online Writing Lab (OWL)
http://owl.english.purdue.edu/

University of Toronto: Advice on academic writing
http://www.writing.utoronto.ca/advice

LEO: The Write Place Catalogue
http://leo.stcloudstate.edu/catalogue.html

Academic Writing in English
http://sana.tkk.fi/awe/index.html

Various guides to academic writing are freely available online. Here are a few for you:

Andy Gillett, Using English for Academic Purposes: Academic Writing
http://www.uefap.co.uk/writing/writfram.htm

UW-Madison Writer's Handbook
http://writing.wisc.edu/Handbook/

The Mayfield Handbook of Technical and Scientific Writing
http://www.mhhe.com/mayfieldpub/tsw/home.htm

Grammar, Punctuation, and Capitalization: A Handbook for Technical Writers and Editors:
http://www.sti.nasa.gov/publish/sp7084.pdf

APPENDIX I: FIND THE ERRORS

Find more than 60 problems (mainly from Finnish interference) in these sentences.

1. The study comprised of 30 men and women over age of 90 years demonstrated that elderly can, despite of their old age, get benefit of a weight training program.

2. Based on that criteria informations indicate their equipments are the finest ones.

3. The aims include, e.g.: 1) to control the behavior for 1 year, 2) discovering non-compliance, 3) a search for means to improve pupil's compliance with teachers' instructions.

4. 53 patients died within one year out of the 3120 and majority of the 53, remarkably was aged under 30 years old, according to data, that was available. *(At least 11 errors here!)*

5. Especially recent results are remarkably better compared to earlier results.

6. It would be wise to participate conferences, as the one in Rome, and in Athens, too.

7 Especially Aho's 2007 results are impressive, compared to Bix's 2004 findings.

8. Her income was 70.000 € but her tax-rate was 48,5 % a rate she wieved as far too high.

9. John Jones discusses about this data shortly in her third articles' result's chapter.

10. On the other hand, these two series are well documented, but on the other hand, Smith's so-called QRX series is a novel phenomena.

11. Also her article soon will appear in "Nature", it is now in print.

12. However, during the recession as much as every seventh nurse was unemployed.

13. Using this method 40 per cent of the students improved and only 5 % failed, Jackson found (Jackson 2006).

14. They studied e.g. sociology and psychology to find advices about marital problems etc.

15. The referee commented, that there are several important earlier researches which have not been mentioned in the introduction.

APPENDIX II: INTRODUCTION EXERCISE

First, glance through the section above on 'The Introduction' (pg 21)

Below is an excellent introduction from a reputable journal. Sentences and clauses have been rearranged and split to allow you practice in recognising strong introduction organization. Consider this a rough draft that you might write, pouring your thoughts onto the page or screen. Find in it the actual four introduction moves. Can you improve some of the end focus? Where might citations appear?

1. In the mechanism underlying the association between increased body weight
2. and OA, mechanical loading across joints is probably involved. However,
3. evidence is inconsistent from cross-sectional surveys for a link between
4. obesity and hand osteoarthritis (OA). In the longitudinal Tecumseh
5. Community Health Study, adult obesity associated with incident hand OA
6. in men and women ages 50-74 years was suggested. Therefore, the
7. relationship between birth weight, childhood growth, adult weight, and hand
8. OA should be examined. Obesity is the strongest risk factor for knee
9. osteoarthritis (OA) and the relationship is not known between OA and body
10. weight in early life. Prospectively collected data from a large population-
11. based birth cohort was used to explore this issue in our study. However, the
12. force across hand joints is not necessarily greater in persons who are
13. overweight, and metabolic factors associated with obesity have been
14. implicated; some of these factors, e.g. impaired glucose tolerance, are also
15. linked to low weight at birth.

Adapted from 'Weight from Birth to 53 Years: A Longitudinal Study of the Influence on Clinical Hand Osteoarthritis,' A. Aihie Sayer, et al., *Arthritis & Rheumatism*, Vol. 48, No. 4, April 2003, p. 1030.

APPENDIX III: EDITING EXERCISES

A. In the following sentences, eliminate the excess wordiness to create a less convoluted sentence.

Our research, designed to test the fatal effects of PGFα on dogs, was carried out by intravenously introducing the drug. In the experiments, a relatively small quantity, 30 mg, was administered to each animal. In each case, PGFα proved fatal. All 10 dogs expired before a lapse of 5 minutes after the injection. (53 words)

Zimbabwean undocumented migrants are shown to be marginalised and vulnerable with limited transnational citizenship. (14 words)

B. This text is intentionally silly, so concentrate only on its language. It has ten verbs in passive voice *italicised*. It mainly needs savage shrinkage!

- R**educe its length** from 115 words; aim at one-**third** of its present length.
- Choose **active-voice verbs.**
- **Freely omit, alter, or rearrange words**. Each of you will edit this differently.
- Finally, **count every word and quantity in your version**.

The effectiveness against narcolepsy of caffeine *was tested* on humans by our group. It was effective, as *was* previously *shown* by Smith when mice that *were found* to be narcoleptic *were given* caffeine when they demonstrated signs of narcolepsy (Smith 2006). Therefore, an experiment *was carried out* by our group. We had 100 male narcoleptics. The initial test dose of caffeine that *was chosen* was 300 mg two times every day. In these subjects, a history of narcolepsy *had been confirmed*. When they *were administered* a dose of 600 mg two times every day, the lowering of their symptoms of narcolepsy to a level that *is considered* in the literature to be normal *was accomplished.*

C. Discuss these three variants. Note differing end-focus. What would follow?

- For disease Z, X may become the treatment of choice, because X is well tested and causes few side-effects. (continue)
- Drug X, because it is well tested and has few side-effects, may become the treatment of choice for disease Z. (continue)
- For disease Z, drug X, well tested and with few side-effects, may become the treatment of choice. (continue)

APPENDIX IV.A: PASSIVE TO ACTIVE IN METHODS

This text is particularly challenging. If you can revise this at all, you'll find revising your own texts quite simple. Despite the challenges it presents, try to improve this Methods section by changing the passive voice → active voice. Next, try to eliminate the repetition by reorganising the text as you revise it. Try to omit half of these words.

A retrospective review of all breast cancer patients treated for local recurrence in our hospital was performed. Cases with other cancers present or unknown primary were excluded. The information was gathered from the patient database of the Department of XXX, Turku University Central Hospital (TUCH), consisting of 5859 breast cancer patients. All the patient records in the database were reviewed, and those patients with local recurrence of breast cancer were selected to be included in this study. A total of 506 patients were found. They had been treated between 2005 and 2009 for local recurrence in the excision scar or for in-transit metastasis. Factors predicting outcome after local recurrence were analysed. Patient records were analysed for patient, tumour, and treatment characteristics. Details on tumour characteristics were obtained from pathology reports, and all pathology reports were re-examined by a specialist in pathology to obtain all information on the primary tumour. Surgical and radiological reports were analysed for follow-up data on patterns and timing of local recurrence. Furthermore, possible development of lymph node or distant metastases was recorded. The ABCD staging system from 2003 was used for grouping patients according to their stage of the primary disease.

[14 passive verbs in 195 words]

APPENDIX IV.B: ROUGH DRAFTS

Revise each of these to create far shorter, more focused sentences in the active voice.

1. We found similar X use in our Finnish population-based studies, which had a high validity for self-reported use, compared with previous studies (ref).

(33 words)

2. X use is strongly associated with male gender, as found in previous studies (ref). X use is uncommon for females. Interestingly, many pregnant women used X, as X use was rare in the general population (ref).

(33 words)

3. In our study children less than one year of age did not show enough cooperation because they did not have the patience to undergo XYZ testing due to the duration of the XYZ examination.

(35 words)

4. In the current study, the X and the Y classification systems were used. When X and Y classification systems were compared, similar estimates of the incidence of this disease were observed. There is though a disappointing finding, that neither of them have prognostic value as shown in the present study.

(50 words)

5. In 1994, in a survey in X province, it was reported that the prevalence of illiteracy was 3% in the 30-60 years old age group. The prevalence rose up to 6% in the 30-60 population in 1997, as shown by our study.

(42 words)

6. Increased levels of phosphate pollution have been associated with fertilizer runoff following the rainy season. (Grammatically correct. Just move words around to focus on the finding.)

(14 words)

7. It is shown in this population-based study, that popular use of biofuels has a significant reduction effect on carbon emissions in major US cities. (Find the who, when and where and revise so that they precede the focal what.)

(26 words)

APPENDIX V: TABLE EXERCISE

First, in the article in which this table would appear, in the Results section, suppose readers meet these lines:

'Table 1 shows the responses found in mice in haemoglobin and in enzyme X after feeding them with the HSF diet and the LC diet and the respective figures for control mice on a normal diet.'

Then, on the same article page, comes the table below. Find the errors throughout this terrible table, ranging from the almost invisible to macro.

Table 1. The responses found before and after the feeding of mice with the HSF diet, the LC diet and a normal diet for 15 and 30 days.

Diet Group Type	Time of blood sample	Length of the diet	Numbers of studied mice	Male mice	Age	Haemoglobin	p values	**Enzyme X**	P-value
HSF diet	Before diet	15 days	18	11/18	2.0	8.6		0.41 µg	
LC diet	Before diet	15 days	18	12/18	1.9	8.5	NS	.37 µg	NS
Normal diet	Before diet	15 days	18	10/18	2.2	8.50		0.39 µg	
HSF diet	After diet	15 days	18	11/18	2.0	8.70		0.43 µg	
LC diet	After diet	15 days	18	12/18	1.9	8.9	NS	0.42 µg	NS
Normal diet	After diet	15 days	18	10/18	2.2	10.10		0.41 µg	
HSF diet	Before diet	30 days	18	9/18	1.5	8.3		0.41 µg	
LC diet	Before diet	30 days	18	10/18	2.1	8.50	NS	.38 µg	NS
Normal diet	Before diet	30 days	18	12/18	1.8	8.4		0.41 µg	
HSF diet	After diet	30 days	18	9/18	1.5	9.1		.44 µg	
LC diet	After diet	30 days	18	10/18	2.1	9.3	< 0.03	0.42 µg	NS
Normal diet	After diet	30 days	18	12/18	1.8	14.1		0.41 µg	

NOTES