

Workshop

Academic Writing

How to create good texts

A workshop of the programme SCIENCEPLUS® by GOLIN WISSENSCHAFTSMANAGEMENT

Deutsche Elektronen-Synchrotron [DESY], Hamburg

ITN Scattering Amplitudes – From Geometry to Experiment [SAGEX]

2. August 2019, 9:00 – 17.00

Trainer: Dr. Barty Warren-Kretzschmar, golin wissenschaftsmanagement, Berlin

For your information

Who are we?

GOLIN WISSENSCHAFTSMANAGEMENT

– founded in 2002 –

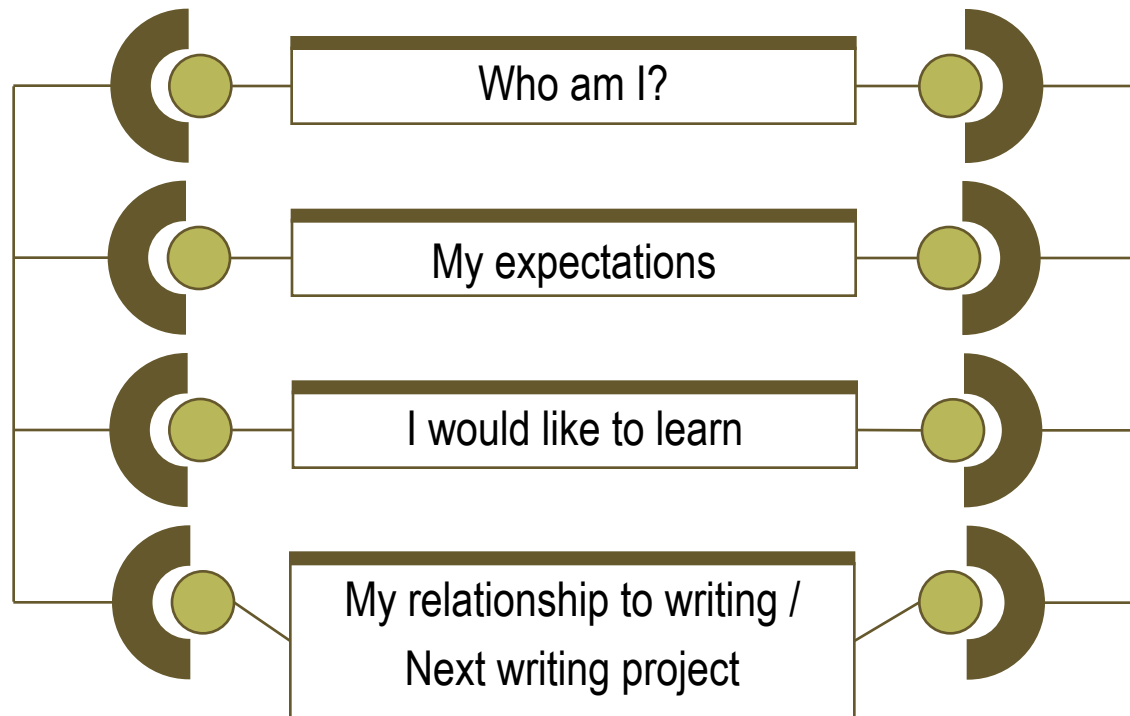
offers advice and support
in not-for-profit management,
in particular in relation to science,
education and foundations.



SCIENCE^{PLUS}[®] is our programme for human resource development in the academic sector offering team development for research groups, workshops, coaching etc.

Introductory round

The participants of the workshop



Agenda

1

Intro

2

Writing for the reader

3

Common mistakes

4

Writing exercises

5

Writing as a process

6

Editing – abstracts

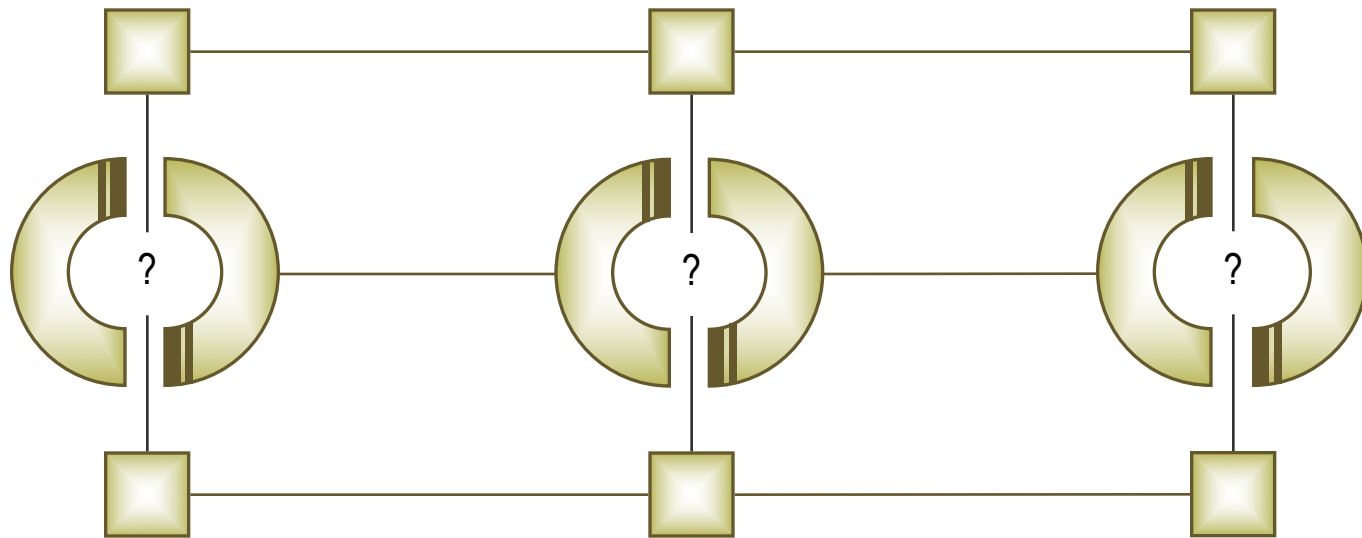
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The next steps

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What is good writing?



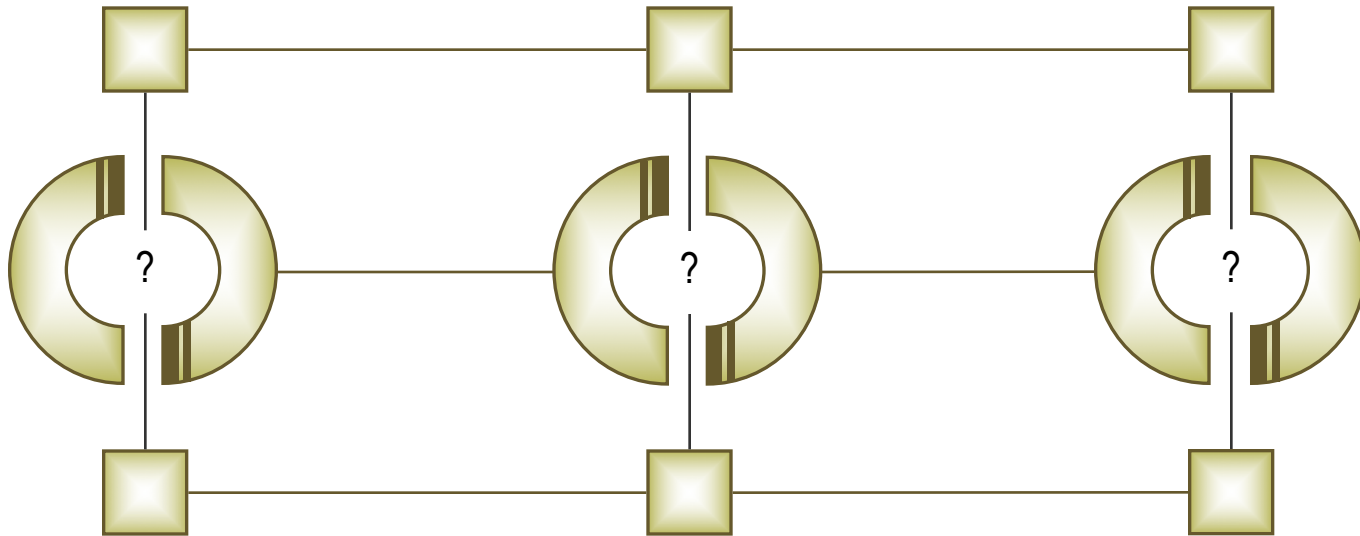
Good writing is ...

- ▶ Understandable
- ▶ Images, clearly stated
- ▶ Flow in logic and structure
- ▶ Format
- ▶ Good grammar

Writing is thinking on paper

- ▶ „Anyone who can think clearly can write clearly“ --- Zinsser
- ▶ You don't know what the reader actually knows. What do they need to know?
- ▶ Take the reader through the same sequence of ideas and deductions you went through.
- ▶ Lead readers, step by step, to grasp a subject.

Writing for the reader



Scientific writing

- ▶ George Gopen and Judith Swan's article:
- ▶ "The Science of Scientific Writing"
- ▶ (*American Scientist*, 1990, 78:550-558),
- ▶ www.bio.ri.ccf.org/ASA_TSHS

- ▶ Summary of principles in hand-out: Wise words

Write for the reader – how do readers read?

- ▶ Readers do not just read, they interpret.
- ▶ Clues come from the structure of the text.
- ▶ Place information where readers expect to find it.
- ▶ **“unit of information”** :
 - ▶ section within a chapter or article or a chapter within a book.
 - ▶ sentence within a paragraph, paragraph within a section,
 - ▶ phrase within a sentence, word within a phrase
- ▶ Ask yourself: **‘Is this the best place to put this?’**

Subject-verb

- ▶ Readers expect **subject** and **verb** close together.
- ▶ Readers want to know what the subject is doing.
- ▶ Anything in between confuses the reader.

1. Follow a grammatical **subject** as soon as possible with its **verb**.

Subject

Verb

- ▶ **The propensity score approach** for bias reduction in treatment comparisons in non-randomised studies **has led to** another round of debates about the use of correlation analyses to make inferences about causality.
- ▶ **The propensity score approach** **has led to** another round of debates.

Stress position

- ▶▶ Readers emphasize the material that arrives at the **end of a sentence**. (**stress position**)
 - ▶▶ Put important information where readers expect to find it, **at the end**.
 - ▶▶ Sentence structure indicates importance of information.
2. Place in the **stress position** the “new information“ you want the reader to emphasize.
- ▶ 2a. Starting salaries are good and getting better **in statistics**.
 - ▶ 2b. Starting salaries in statistics are **good and getting better**.
- ▶▶ “Save the best for last”

Topic position

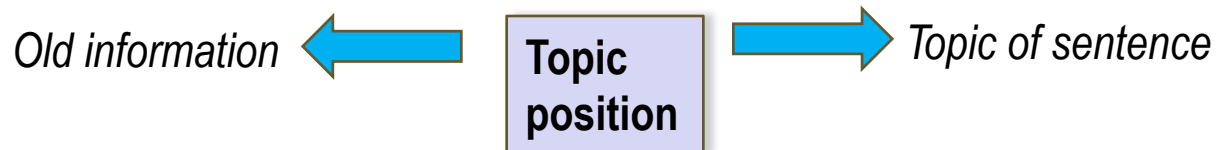
- ▶ The reader expects context in the beginning. They want to know what the sentence, paragraph is about.
3. Place the person or thing whose “**story**” a sentence is telling at the beginning of the sentence, in the **topic position**. “First things first”
- ▶ 3a. **Bees** disperse pollen.
 - ▶ 3b. **Pollen** is dispersed by bees.

Topic position

- ▶▶ The reader wants to know **how the information is connected** to past information.
- 4. Place appropriate “**old information**“ (material already stated in the text) in the **topic position**.

Readers expect the information in the topic position with :

linkage (looking backward) and context (looking forward).



To summarize:

„Put in the topic position the old information that links backward; put in the stress position the new information you want the reader to emphasize.“

1. The **backward-linking old information** appears in the **topic position**.
2. The **person, thing or concept it is about** appears in the **topic position**.
3. The **new, emphasis-worthy information** appears in the **stress position**.

Action verbs

- ▶ Readers expect the action of a sentence to be articulated by the verb.

5. Articulate the action of every clause or sentence in its verb.

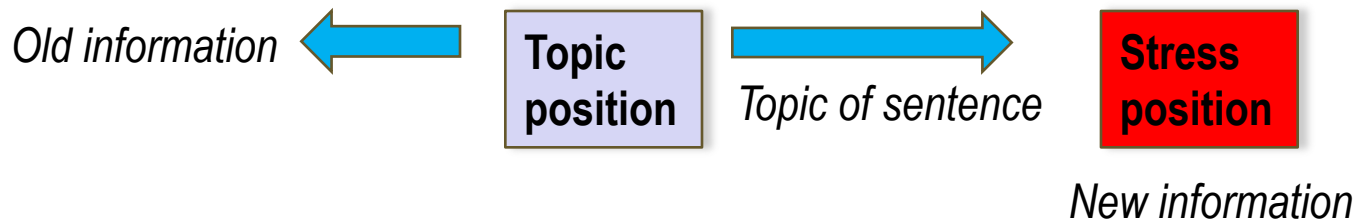
- ▶ 5a. The propensity score approach for bias reduction in treatment comparisons in non-randomized studies **has led to** another round of **debates** about the use of correlational analyses inferences about causality.
 - Lifeless verb* (red text) with an arrow pointing to **has led to**
 - action verb* (green text) with an arrow pointing to **has led to**
 - Action is in the noun* (red text) with an arrow pointing to **debates**
- ▶ 5b. The propensity score approach **offers** a way to reduce bias when comparing treatments in non-randomized studies. However, researchers **are debating** yet again about using correlational analyses to infer causality.
 - Action is in the verb* (green text) with an arrow pointing to **debating**

Logical links

- ▶ The reader needs to know how information is logically linked.
- 6. In general, **provide context** ... before asking the reader to consider anything new.
 - ▶ Look for logical links.
 - 6a. Career opportunities are strong in statistics and starting salaries are good and getting better. Statisticians who have strong oral and written communication skills are the most successful.
 - 6b. Career opportunities are strong in statistics and starting salaries are good and getting better. **This situation** is especially true for new statisticians who have strong oral and written communication skills.

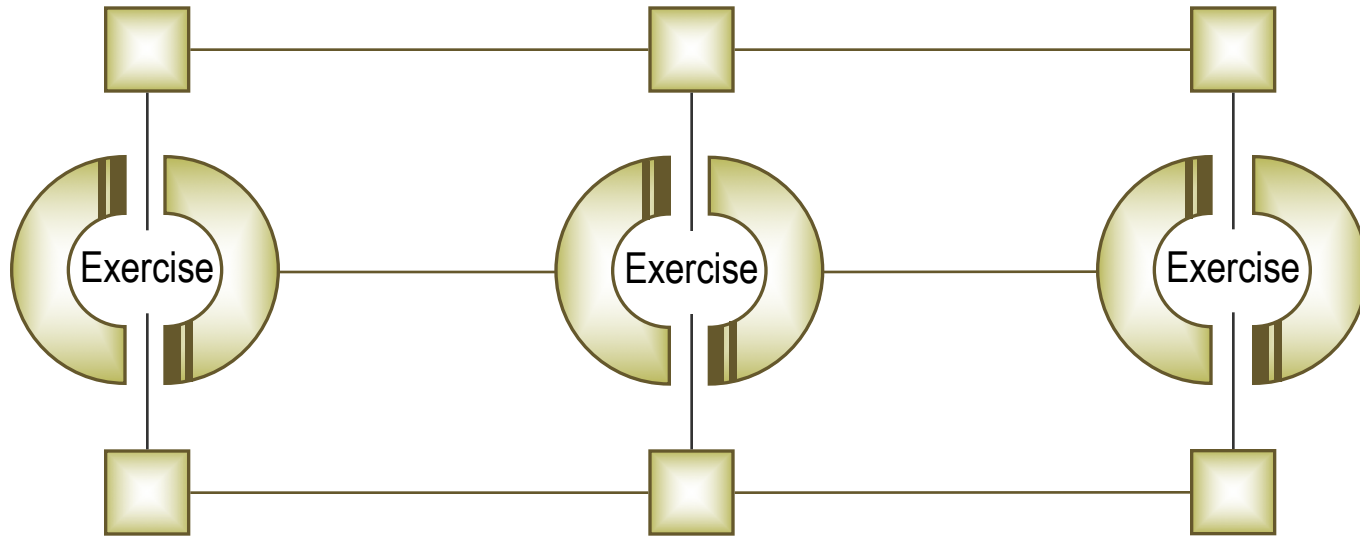
Finally...

- ▶ 7. In general, try to ensure that the relative **emphases** of the substance **coincide with** the relative expectations for emphasis raised by the **structure**.
- ▶ These are not rules, but rather reader-expectation principles.
- ▶ Try to write so you fulfil the readers' needs, not the writer's needs.

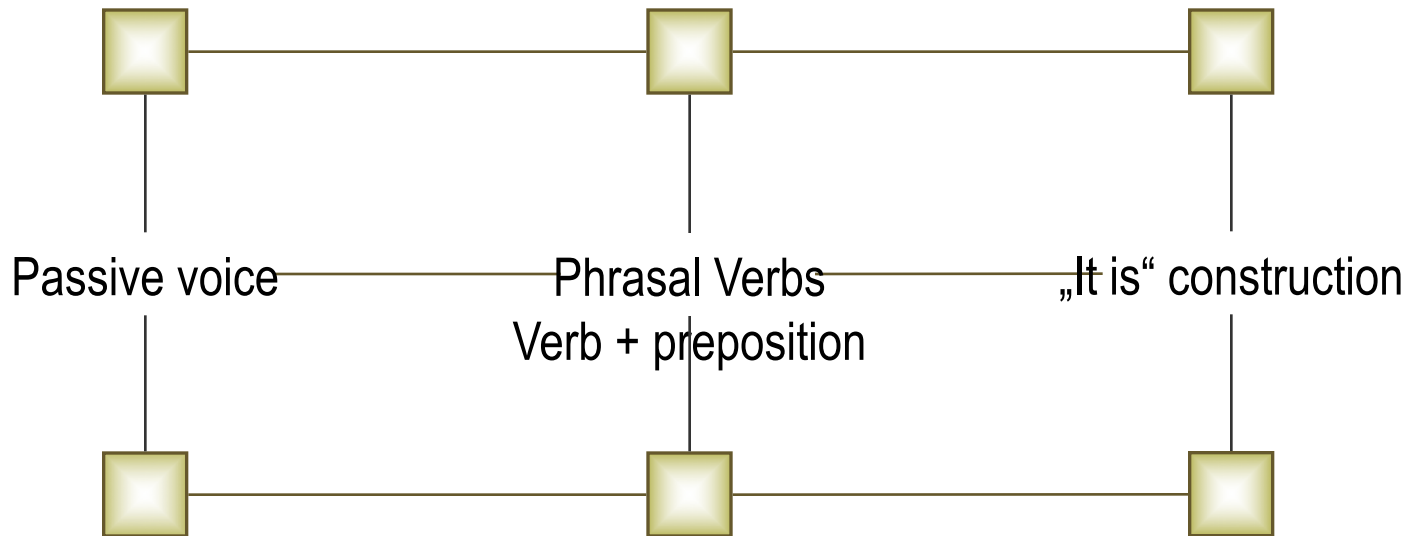


Try it with your text

Check your text for clarity and emphasis. Then revise your text.



Verbs



Passive voice:

A word about style

How to recognize the passive voice:

- ▶ Some form of the verb **to be** :
is/are, was/were, has/ have been, had been, may be, will be.
- ▶ and a past participle (often ends in **-ed**) :
*Were studi**ed**, is being consider**ed**, will be examin**ed**.*
- ▶ *The agent (person or thing doing the action is introduced with „**by**“)*

Examples of passive and active voice

A word about style

Passive Voice	Active Voice
It <i>is recommended by</i> the authors of the present study that...	We recommend... (<i>active voice</i>)
The data which <i>were obtained by</i> Johnson <i>were probably indicative of</i> ...	Johnson 's data probably indicate ...
The following results <i>were obtained</i> ...	We obtained these results ...
It <i>was discovered</i> that a sustained coordinated effort <i>will be required</i> ...	We need a sustained coordinated effort.

Try it out. Change sentences to active voice

A word about style

1. It might be expected that this treatment would be effective.
One might expect this treatment to be effective. OR We expect this treatment ..
2. No feed was available to the pathologist to analyze.
The pathologist had no feed to analyze.
3. Inoculation was performed on 25 chickens by Jones and colleagues.
Jones and her colleagues inoculated 25 chickens.
4. A collecting trip was made by this writer to Georgia for the purpose of collecting Lepidoptera.
I traveled to Georgia to collect Lepidoptera.
5. Passages A and B should be marked for revision.
Mark passages A and B for revision.

When to use active and passive sentences

A word about style

- ▶ **To adjust the topic and emphasis position.**

Bees make pollen. (active)

Pollen is made by bees. (passive)

- ▶ **To avoid saying who is doing the action**

If the rainforests continue **to be stripped** to serve short-term economic interests, the entire biosphere may **be damaged**.

If loggers continue **to strip** rain forests to serve short-term economic interests, they may **damage** the entire biosphere.

When to use active and passive sentences

A word about style

3. “Hedging” (When you are not sure)

The method can be developed.

We can develop the method.

- ▶ Active sentences are clearer, more natural and stronger statements.
- ▶ We do not speak in the passive voice.
- ▶ Good writing should sound as if you are speaking to someone.

- ▶ **Use the active voice unless you have a good reason to use the passive.**

Use a „single“, strong verb

A word about formal style

- ▶ Informal style uses **verb + preposition**
- ▶ The use of touch-screen voting systems could **get rid of** many problems associated with traditional paper-based ballots. →
- ▶ The use of touch-screen voting systems could **eliminate** many problems associated with traditional paper-based ballots.

Avoid impersonal expressions – “It is ...”

A word about style

- ▶ Delays the subject
- ▶ **1. Replace with modal verb (can, must, etc.)**
- ▶ “**It is**” ... necessary, advisable, possible
- ▶ **It is necessary** to use reliable data.
- ▶ Reliable data **must** be used.
- ▶ **It is possible** that GIS software will become less expensive.
- ▶ GIS software **may** become less expensive.

Avoid impersonal expressions - “It is ...”

A word about style

▶▶ 2. Use adverbs instead

- ▶▶ “It is” ... surprising, clear, probable.... → surprisingly, clearly, probably
- ▶▶ **It is regrettable that** the findings do not show statistical significance.
- ▶▶ **Regrettably/unfortunately**, the findings do not show statistical significance.
- ▶▶ **It is clear** that a multi-criteria analysis is necessary.
- ▶▶ A multi-criteria analysis is **clearly** necessary.

Avoid impersonal expressions - “It is ...”

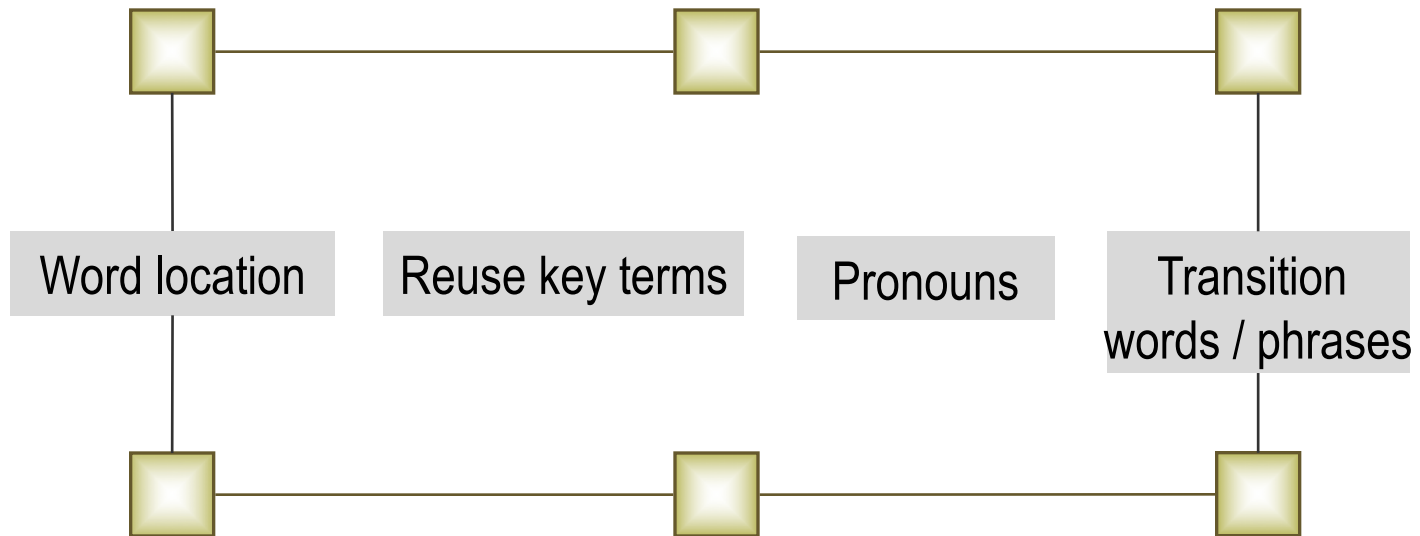
A word about formal style

▶ 3. Rearrange the sentence

- ▶ **It is possible** to demonstrate (Thomas 1999) that ...
- ▶ Thomas (1999) demonstrated that ...

- ▶ **It is found that** public participation improves planning results.
- ▶ **We found that** public participation improves planning results.
- ▶ **The findings indicate** public participation improves planning results.

Linking Sentences



1. Linking sentences: word location (connect emphasis and topic position)

A word about sentences

- ▶ **Connect your sentences by linking words at end of one sentence with words at the beginning of the next sentence.**

Emphasis

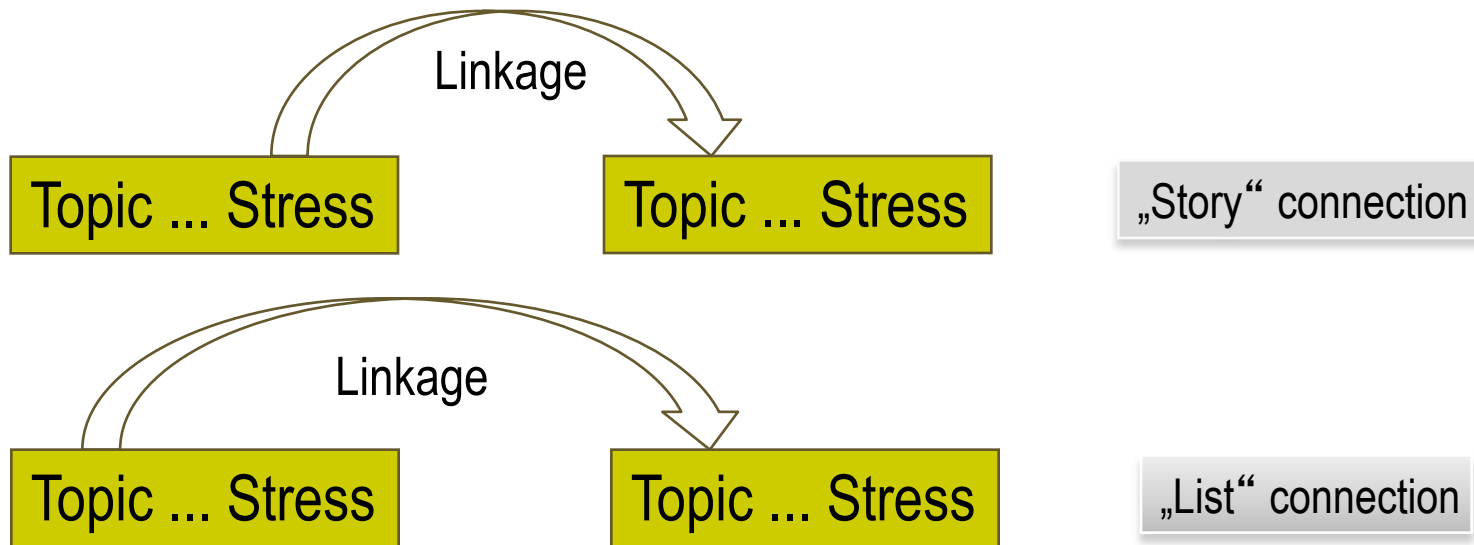
Topic

- ▶ The genus *Yesinia* contains several **species**. The cause of bubonic plague, also know as the “black death”, is one **species**, *Y. pestis*.



- ▶ The genus *Yesinia* contains several **species**. One **species**, *Y. pestis*, is the cause of bubonic plague, also know as the “black death”.

Linking sentences



Linkages

List



- ▶ Molecules are comprised of covalently bonded atoms. Molecules' reactions are controlled by the strength of the bonds. Molecules, however, sometimes react slower than bond strength would predict.

Story



- ▶ Molecules are comprised of covalently bonded atoms. Bond strength controls a molecule's reactions. Sometimes however, those reactions are slower than bond strength would predict.

2a. Linking sentences: reuse key terms

A word about sentences

- ▶ **Key terms** are words or phrases that identify important ideas.
 - ▶ **Key terms** should be clearly defined and used identically throughout the text.
 - ▶ Repeating **key terms** will emphasize your main points.
 - ▶ Repeat **key terms** exactly.
-
- ▶ To assess original conditions of crystal nucleation and growth in metamorphic rocks, it is necessary to analyze **crystal distribution** quantitatively. **Density** could potentially provide insight into the time scale of mineral growth following the thermal peak of metamorphism.

2b. Linking sentences: reuse key terms

A word about sentences

- ▶▶ Key terms are words or phrases that identify important ideas.
 - ▶▶ Key terms should be clearly defined and used identically throughout the text.
 - ▶▶ Repeating key terms will emphasize your main points.
 - ▶▶ Repeat key terms exactly.
-
- ▶▶ To assess original conditions of crystal nucleation and growth in metamorphic rocks, it is necessary to analyze **crystal distribution** quantitatively. **Density of crystal distribution** could potentially provide insight into the time scale of mineral growth following the thermal peak of metamorphism.

3. Linking sentences: transition words

A word about sentences

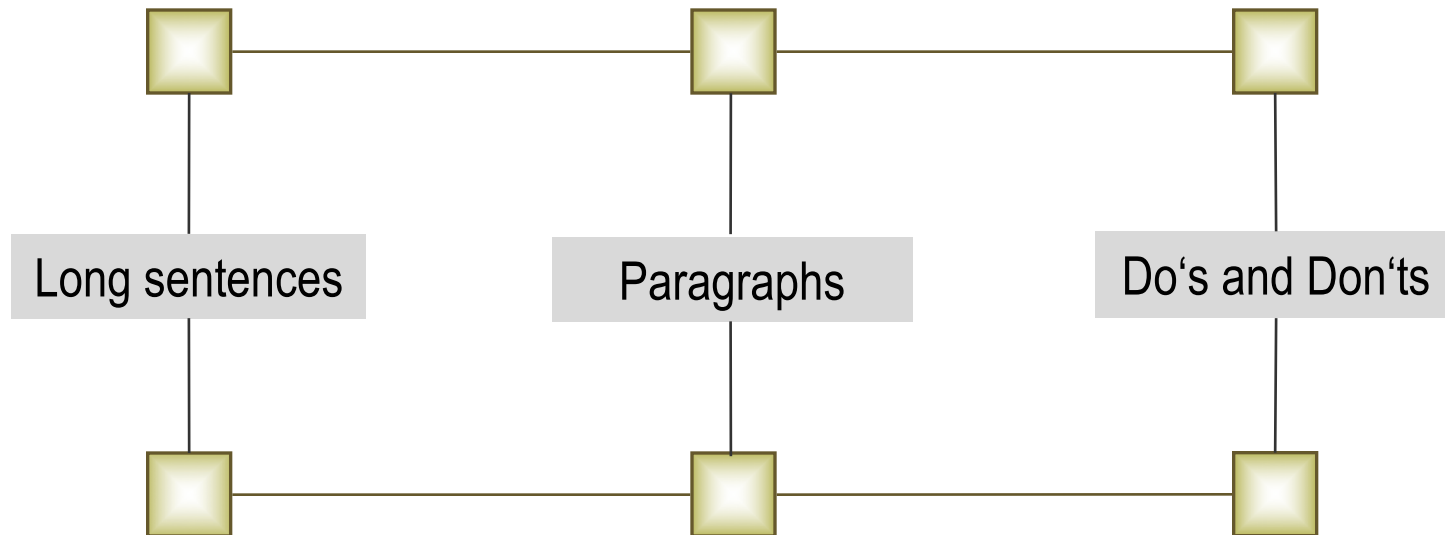
- ▶ **Transition words** or phrases show the logical relationship between sentences/paragraphs.
- ▶ **Transition words** or phrases should be placed at the beginning of a sentence and set off by commas.
- ▶ **Transition words** are also “sign posts” for readers.
- ▶ Eg. In addition, for this purpose, however, first...

4. Linking sentences: Pronouns connect

A word about sentences

- ▶ Use a pronoun to refer to the last emphasized information.
- ▶ Look for logical links.
 - 6a. Career opportunities are strong in statistics and starting salaries are good and getting better. Statisticians who have strong oral and written communication skills are the most successful.
 - 6b. Career opportunities are strong in statistics and starting salaries are good and getting better. **This (situation)** is especially true for new statisticians who have strong oral and written communication skills.

Usage and style



One thought, one sentence

A word about sentences

- ▶ Simple sentences are the best way to express complex concepts.
- ▶ People talk in short sentences.
- ▶ Write as if you are talking to someone, speaking to the reader.
- ▶ **Breaking up long sentences:** Statement (first sentence). Details or qualifier (second sentence).

Breaking up long sentences

A word about sentences

- ▶ The effective Communicator, John Adair:
- ▶ 90% of people understand 8 word sentence.
- ▶ 4% of people understand a 27 word sentence.

- ▶ The longer the sentence, the greater the chance it will be misunderstood.
- ▶ Today average length of sentences are 15 to 18 words.

- ▶ **No sentence should have more than 30 words!**

Breaking up sentences – what to look for

A word about sentences

- ▶▶ Consider starting a new sentence if there is:
 - ▶ And, which, a link word, the –ing form, in order to, ...
- ▶▶ Use periods freely, commas wisely.
- ▶▶ Shorten sentences and repeat key words. It will give your writing clarity.

- ▶▶ English, [which is] now spoken by more than a billion people from all over the world, the biggest populations being those in China and India, and more recently in some ex British colonies in Africa, is the world's international language.

Suggestion

A word about sentences

English, [which is] now spoken by more than a billion people from all over the world, the biggest populations being those in China and India, and more recently in some ex British colonies in Africa, is the world's international language.

- ▶▶English is the world's international language.

- ▶▶It is now spoken by more than a billion people from all over the world.

- ▶▶The biggest populations are those in China and India, and more recently in some ex British colonies in Africa.

Long sentence

- ▶▶ In particular, in the context of Quantum Field Theory (QFT), the amplitude for a scattering of some initial state at $t \rightarrow -\infty$ of n_i particles into a final state at time $t \rightarrow +\infty$ of n_f particles is given by the element of the S-matrix
- ▶▶ $A = \langle \text{out} | S | \text{in} \rangle$,
- ▶▶ where $|\text{out}\rangle$ and $|\text{in}\rangle$ are asymptotic states given by the direct product of single free particle states characterized by the on-shell momenta p_i (where $p_i^2 = m_i^2$ and m_i are the physical mass of the particles) and the polarizations ϵ_i of the external particles.

Anatomy of a paragraph

A word about paragraphs

- ▶ Begin each paragraph with a topic sentence.
- ▶ Develop the topic in the rest of the paragraph (logical progression)
- ▶ If appropriate, end with a concluding sentence.



Length of paragraph

- ▶ Minimum of three to five sentences
- ▶ Break up long paragraphs into sub-topics or messages
- ▶ Highlight important information with shorter paragraphs.

Topic sentence : the first sentence of a paragraph

A word about paragraphs

- ▶ Topic sentence gives the reader an **overview** of the paragraph and guides the reader into the paragraph.
- ▶ The topic sentence also gives a **transition** from the previous paragraph.
- ▶ **The stress position** of topic sentence highlights the ideas or topic of the rest of the paragraph.
- ▶ The **rest of the paragraph** develops the message by using examples, definitions, justifications, contradictions, or by analyzing or solving a problem.



When to use „which“ or „that“

Common mistakes

Use „**that**“ without commas for all **restrictive** clauses
Use „**which**“ with commas for all **non-restrictive** clauses

- ▶ **Restrictive clause** cannot be omitted without changing the meaning of the sentence.
- ▶ Restrictive „**that**“ clause:
Dogs **that** were treated with antibiotics recovered.
- ▶ **Non-restrictive clause** adds information, but does not limit what it modifies. It can be omitted without changing the meaning of the sentence.
- ▶ Non-restrictive „**which**“ clause:
The researcher’s decision, **which** did not come easily, was final.

Avoid nominalization : Verbs hidden in nouns

A word about style

- ▶▶ A nominalization is a noun derived from a verb or an adjective: verb → noun
- ▶▶ Verb-based nouns end in **-ent**, **-ence**, **-ant**, **ency**, **-ancy**, **-ment**, **-tion**, **-sion**.
 - ▶ **movement** → To Move, **acceptance** → To Accept
 - ▶ Antibody **detection** accomplished by Team A →
 - ▶ Team A **detected** antibodies.
 - ▶ Results showed **protection** by the vaccine, but **degeneration** of lymphocytes occurred.
 - ▶ The vaccine **protected** the patients, but their lymphocytes **degenerated**.
- ▶▶ **Use the verb instead of the noun.** It activates your writing.

Aim for efficiency

A word about style

- ▶ Leave out „filler words“. (List of jargon)
- ▶ Get to the point! Just say it.
 - ▶ It may be difficult to make a decision about the method that we should use. →
 - ▶ Choosing the proper method may be difficult.
- ▶ Omit needless words:
 - ▶ „The Elements of Style“ by W. Strunk Jr. and E.B. White
 - ▶ www.bartleby.com/141

Don't start a sentence with: „and, but, because, so“

A word about formal style

- ▶▶ To add further information:
„**And**“ → in addition, additionally, further, furthermore, indeed or moreover
- ▶▶ To contrast or contradict information:
„**But**“ → however, in contrast, instead, nevertheless, occasionally, of course, on the contrary, or otherwise
- ▶▶ **Because** → combine sentence with previous one
- ▶▶ To introduce information from previous sentence:
So → accordingly, as a result, consequently, hence, in short, subsequently, therefore, thus, or to this end

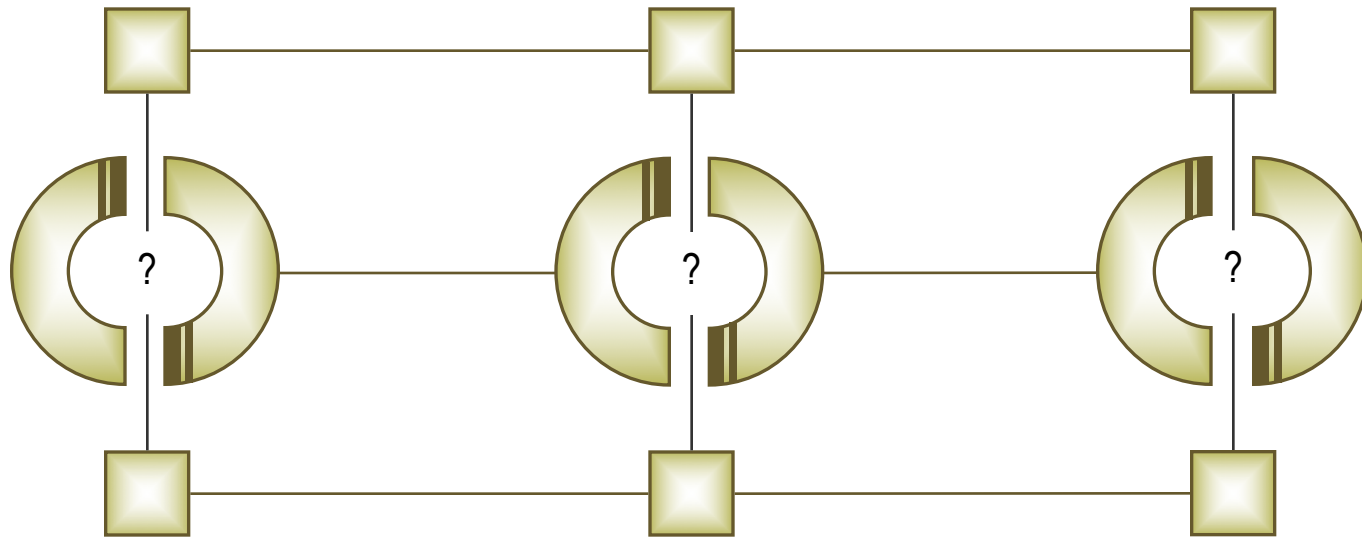
Avoid „Get“

A word about formal style

- ▶▶ My supervisor **got** excited when I **got** some results using samples I **got** from Africa. However, she **got** angry when she **got** to know that I had **got** hold of them illegally.
- ▶▶ My supervisor **became** excited when I **obtained** some results using samples from Africa. However, she **grew** angry when she **discovered** that I had **acquired** them illegally.

Writing exercises

- ▶ Free writing
- ▶ Writing to a prompt
- ▶ Generative writing



Method one: Freewriting

How to get started

- ▶ Peter Elbow (1973) developed the approach in England
- ▶ Write for ten minutes
- ▶ Write without stopping
- ▶ In sentences (without worrying about grammar, punctuation, etc.)
- ▶ do not reread or edit what you have written
- ▶ Private writing: no external reader
- ▶ Topic: **some aspect of your research, problems, next steps...**
- ▶ No structure needed

What academics say they use freewriting for:

Getting started

- ▶ For „self-discussion“, thinking about both sides of an issue.
- ▶ To think through alternatives to your own view.
- ▶ For linking different ideas.
- ▶ Developing the writing habit.
- ▶ Getting initial thoughts, generating ideas.
- ▶ Preparing the analysis
- ▶ Ventilating feelings and ideas
- ▶ Breaking through existing structure in your thinking and discussion
- ▶ Sumarizing knowledge
- ▶ Doing the first draft

Freewriting session

Writing strategies

- ▶ Write for 10 minutes, without stopping,
- ▶ All the questions you currently have about your study.
- ▶ Some aspect of your research.
- ▶ The question „What can I write about now?“
- ▶ What I want to include in my nine month report.
- ▶ What I would like to achieve with my dissertation.
- ▶ What writing have I done and what would I like to do?
- ▶ How does what I read compare with my own views?

Writing results

Writing strategies

- ▶▶ Reread your text, what did you notice about your text?
- ▶▶ What did you realize about your topic:
 - ▶ What interesting aspects did you find?
 - ▶ Did you find new ideas?
 - ▶ Where is there a break in the text? Why?
- ▶▶ What still needs clarification, what is still not clear?
- ▶▶ What did you find out about yourself? Can you identify strengths or wishes that you you have?
- ▶▶ Could you answer any questions?
- ▶▶ What do you want to work on next?
- ▶▶ Where there parts of the writing that you think you could use later in your text.

Writing results

Writing strategies

- ▶▶ Grammar and style are not perfect, and it may not be well structured, but it is a start.
- ▶▶ Goal is not to have a finished product, but to move your thinking forward.
- ▶▶ Stop procrastinating

Using freewriting for academic writing

Getting started

- ▶▶ As a warm up for academic writing.
- ▶▶ To overcome procrastination.
- ▶▶ To generate topics for your paper and sections.
- ▶▶ To develop fluency – ease of writing.
- ▶▶ To start developing the habit of writing in increments.
- ▶▶ To clear your thoughts.
- ▶▶ To increase your confidence in your writing.
- ▶▶ To stop yourself from editing too soon.
- ▶▶ Articulating your thoughts.
- ▶▶ To write your first draft.

Method two: Writing to a prompt

How to get started

- ▶▶ Use a fragment of a sentence or question to stimulate writing,
- ▶▶ Write the prompt at the top of the page:
 - ▶▶ A topic from your thesis/journal article outline...
 - ▶▶ A question or topic from your free writing...
 - ▶▶ Where do my ideas come from?
 - ▶▶ Who has influenced my ideas?
 - ▶▶ What I want to write about next is...
- ▶▶ 10 minutes writing
- ▶▶ Read, reflect and discuss what you wrote

Method three: Generative writing

Writing strategies

- ▶ Write for ten minutes
 - ▶ Without stopping
 - ▶ In sentences
 - ▶ Stick to one topic, possibly something from your free writing.
-
- ▶ Let someone else read it.

The writing ,sandwich‘

- ▶ This combines writing and talking
- ▶ **Step 1: Writing** in a short burst (**10 minutes private writing**)
- ▶ **Step 2: Talking** for ten minutes with a peer (,writing buddy‘ or writing group participant) about what you both wrote (**5 minutes each**)
- ▶ **Step 3: Writing** for five or ten minutes, building on what you discussed.

Benefits of the writing ,sandwich‘

- ▶▶ It's quick and does not take up much time.
- ▶▶ You have a real audience who gives you real response to your writing.
- ▶▶ You receive immediate feedback.
- ▶▶ You can respond immediately, in further writing for your paper.
- ▶▶ Discussion usually stimulates further writing.
- ▶▶ It may be the only writing time you schedule!
- ▶▶ It stops you 'from biting off more than you can chew'. Learn to set realistic sub-goals.
- ▶▶ Helps develop new prompts such as:
 - ▶ I have to define this more carefully...
 - ▶ I have made a bit of a jump here, the connection is ...

Blitz exposé about your research / publication

From idea to text

Write for **30 minutes** about your research, in sentences, on seven prompts:

- ▶ **State** the subject of your thesis in one sentence.
- ▶ **List** the aims of your research/analysis
- ▶ **Describe** what you did to achieve your aims.
- ▶ **Describe** what you found in your analysis. Explain what it means.
- ▶ **Define** what is original about it.
- ▶ **List** three subjects that remain unresolved.

How many words did you write?

Write a 275 word abstract – Brown's 8 questions

From idea to text

Write for **30 minutes** on the subject of your journal article, in sentences, on eight prompts:

1. Who are the intended readers? List three to five of them by name.
2. What did you do? (50 words)
3. Why did you do it? (50 words)
4. What happened [when you did that]? (50 words)
5. What do the results mean in theory? (50 words)
6. What do the results mean in practice? (50 words)
7. **What is the key benefit for the reader? (25 words)**
8. What remains unresolved? (no limit)

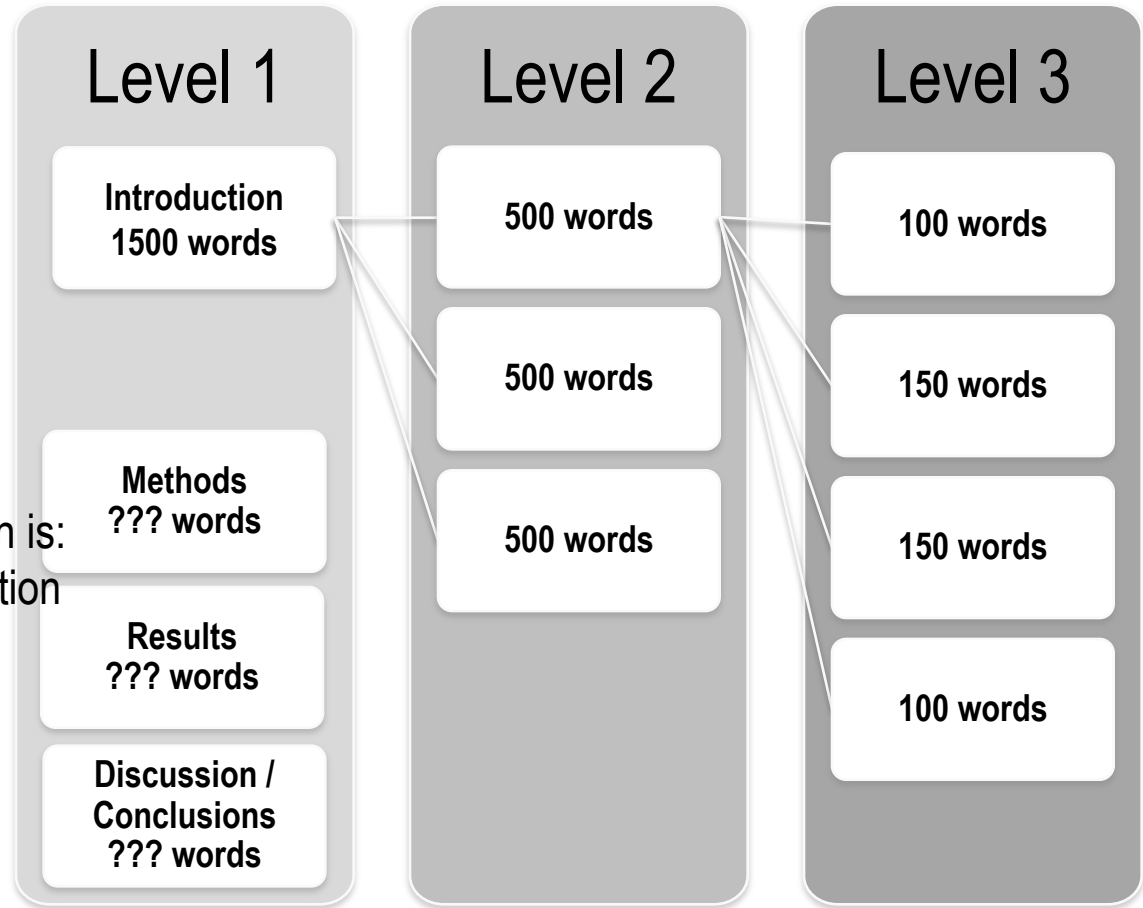
Murray's 10 prompts: 375 word abstract

1. This work needed to be done because... (25 words)
2. Those who will benefit from this include ... (25 words)
3. What I did was ... (50 words)
4. How I did it was by ... (50 words)
5. When I did that what happened was ... (50 words)
6. I worked out what that meant by using ... (50 words)
7. I did what I set out to do to the extent that ... (50 words)
8. The implications for research are ... (25 words)
9. The implications for practice are ... (25 words)
10. What still needs to be done is ... (25 words)

Outlining for a scientific paper

Purpose:

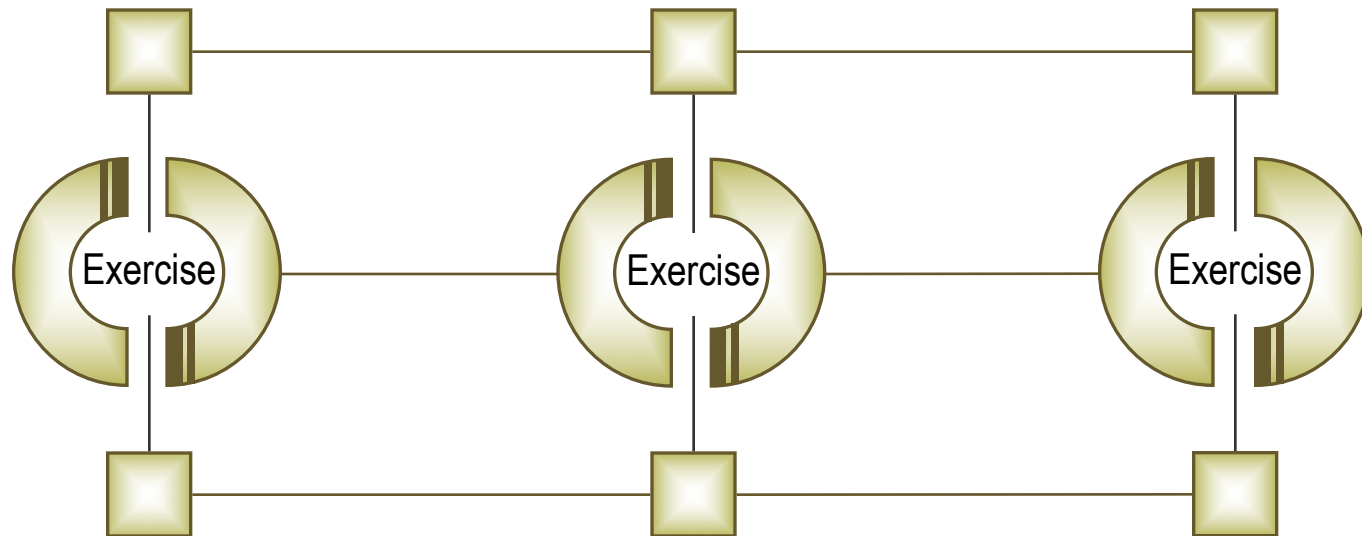
- ▶▶ Generate ideas.
- ▶▶ Form a structure
- ▶▶ Link ideas
- ▶▶ Generate text in short writing sessions.
- ▶▶ For each section, write to the following prompts:
- ▶▶ 1. The objective of this section is:
- ▶▶ 2. What is covered in this section



Outline as a guide for short, focused writing sessions

- ▶ Time allocation: **30 minutes**
- ▶ Start with **5 minute warm-up**: ‚What I want to write about today is...‘
- ▶ Then **25 minutes** of writing to a prompt from your outline: 100 words.
- ▶ If you have time, write another 100 words for another sub-sub-section.
- ▶ End with instructions for the next writing session.
 - ▶ My next writing session is to define ...
 - ▶ My next session will summarize ...
 - ▶ My next 30 minutes will be used for describing ...

Think of a situation when writing felt easy, when it „flowed“. Tell your partner about it.



Writing process

Solutions?

- ▶▶ Never „finish“ writing -
 - ▶ Leave something for the next writing session – key words
- ▶▶ Shrink your subject
- ▶▶ Free writing - Just start typing
 - ▶ Write about anything – how you feel about writing
- ▶▶ Create space for writing – organize time

Writing process

Solutions?

- ▶▶ Talk to someone about what you want to write. „Talk it out“
 - ▶ Formulate in your own words
- ▶▶ Diagram your thoughts, write later
- ▶▶ Find a friend or partner to accompany you in this process
- ▶▶ Editing – find someone to read and correct your text
- ▶▶ Calm down, find a moment to relax, plan „islands of time“ for yourself
- ▶▶ Reward yourself when you have met a goal

Writing process: some strategies

Writing journal articles

- ▶ Pay attention to „role-model“ papers in your discipline
- ▶ Find a mentor (either native or non-native speakers) who knows the ropes, advise on journals
- ▶ Develop a sense of the anticipated audience – what needs to be said, and what not.
- ▶ Recognize the need for some stylistic variation. (Formal vs. Informal)
- ▶ Engage in co-authorship, but without becoming dependent on others.

When I am stuck and can't keep writing ...

- ▶ Read your text aloud, reading and writing activates thinking.
- ▶ Read your text before you go to sleep at night.
- ▶ Read your text, get up and move.
- ▶ Explain what you want to write to someone else.
- ▶ Go jogging...

How do you develop and structure your thoughts / text?

- ▶ Brain storming,
- ▶ clustering → outline,
- ▶ Mind mapping,
- ▶ „talk it through“ with someone
- ▶ ...

The inner editor is too loud!

- ▶ **Perfectionism** and high expectations fuel the inner critic
„sounds dumb“, „You have no idea what you are doing...“

Tips:

- ▶ Set a deadline.
 - ▶ A defence against perfectionism. Limit the amount of time that you invest, accept the text as a product that you can improve. Limited time – limited results. It is just a draft.
- ▶ Consider your expectations and objectives – are they realistic?
 - ▶ Summary for colleagues or the Nobel prize?
- ▶ Know who you are writing for – your PI?
 - ▶ Consider his/her requirements. Image someone who is interested in your topic. What kinds of questions could they have? Talk to them.

Silencing the inner critic

- ▶▶ **Change your genre.** Write a letter to a colleague that explains what you are doing. Write in your journal about the article or experiment.
- ▶▶ Don't let the inner critic stop your flow. Start formulating your ideas, and fix the details later. Use free writing. „**It is just a draft.**“
- ▶▶ Write down the inner critic's comments.
- ▶▶ Who are your inner critics? Give them names.

Writing process

Writing “barriers”

- ▶▶ “I can’t find time to write” or “I could write more, if I could find a block of time.”
 - ▶ Don’t “look for” time; allot time.
 - ▶ Make a writing schedule.
 - ▶ Regularity is more important than the amount of time.
 - ▶ Start with four hours a week.
 - ▶ Avoid binge writing.
 - ▶ Ruthlessly defend your writing time. Stop distractions: go offline, turn off telephone, ... and say “no”.

Make writing a habit

Writing process

Writing “barriers”

- ▶ “I need to do some more analysis first.” or “I need to read some more articles.”
 - ▶ Binge writers are binge readers, binge statisticians, binge...
 - ▶ Include pre-writing in your writing time.
 - ▶ Pre-writing includes, reading, outlining, idea generation, data analysis...
 - ▶ Writing is not just typing. Any activity that helps complete a writing project counts as writing.

Do what you need to do during your **allotted writing time**.

Writing process

Writing “barriers”

- ▶▶ “I am waiting until I feel like it.” or “I write best when I am inspired.”
 - ▶ Waiting for inspiration does not work.
 - ▶ You will need more than “feeling like it” to finish your dissertation.
 - ▶ People with a writing schedule write more and have more creative ideas than “spontaneous” writers.

Routine is a better friend than inspiration. (R. Keyes, 2003)

Writing as a process

Motivational tools – managing your writing time

Setting goals is part of the writing process.

- ▶▶ People who write a lot also plan a lot.
- ▶▶ Devote a writing session to developing and clarifying your writing goals.
- ▶▶ List your writing project goals. What do you want to write in the next three months?
- ▶▶ Post the list of projects where you can see them. (The question is not “Will I get these projects done?” rather “How many weeks will I need to get them done?”)
- ▶▶ Set concrete goals for each day of writing. Break goal into smaller units
 - ▶ At the beginning of a writing session set specific, focused, concrete goals for the day.

Writing as a process

Motivational tools – managing your writing time



Monitoring progress



- ▶ Monitoring motivates. Observing and recording your behaviour will keep you honest.
- ▶ Keep a record of your writing sessions.
 - ▶ Date, day of the week, words, goal, project, ...
- ▶ Monitoring supports goals. Watching your writing progress reinforces your goals.
- ▶ Monitoring helps to set better goals. It will help you estimate how much time you need to write something.
- ▶ Reward yourself when you reach a writing goal, (but don't reward yourself with a free day.)

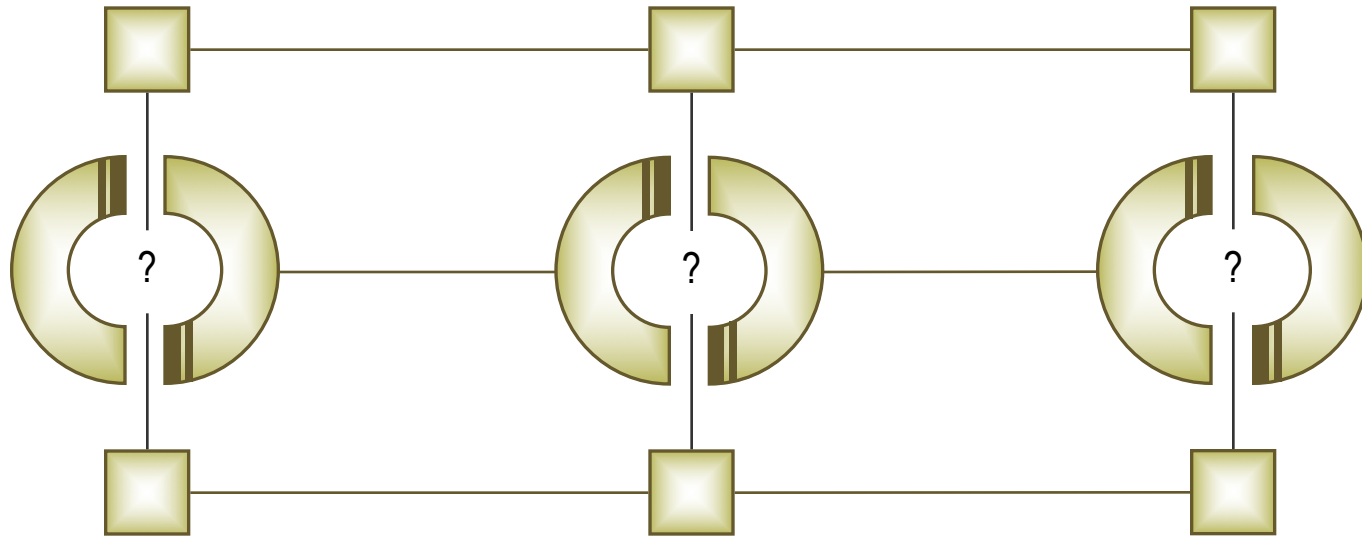
Writing as a process

Next steps

Writing groups

- ▶ Set concrete, short-term goals that you can complete before the next meeting and monitor progress.
 - ▶ Write goals down and bring to meetings. No “trying”.
 - ▶ Meet every week, or every two weeks.
- ▶ Stick to goals. Check off completed goals. Decide on new goals.
 - ▶ Keep meetings short.
 - ▶ Help failing members to decide on a realistic writing schedule.
- ▶ Meet in a coffee shop.

Explain your research topic in three sentences



Explaining the research question

From idea to text

Formulate the research question.

- ▶▶ **Step one:** Name your topic. (What you are writing about)
 - ▶ *I am trying to learn about (working on, studying) _____ .*

- ▶▶ **Step two:** Add a question. (What you don't know about it.)

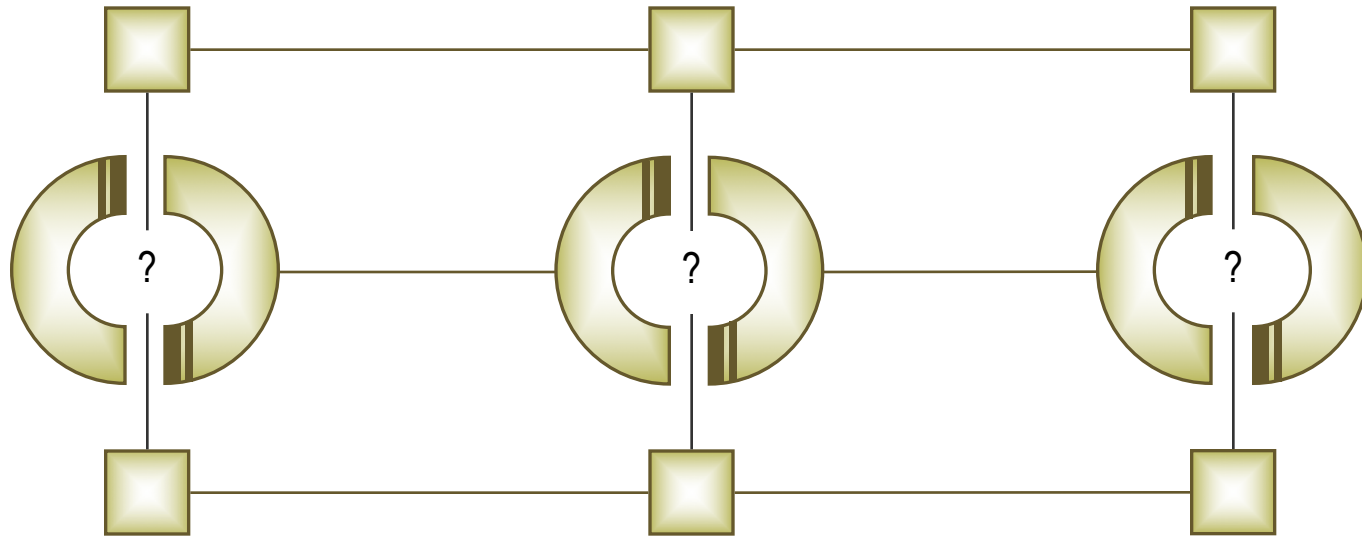
I am studying x

 - ▶ *because I want to know who / what / when / where / whether / why / how _____ .*

- ▶▶ **Step three:** Motivate your question. (Why you want your reader to know about it – your rationale)
 - ▶ *in order to help my reader understand how, why, whether _____ .*

Journal articles

Which qualities should it have? Which requirements should it fulfill?



Planning a scientific manuscript

- ▶ Choose the journal.
- ▶ (Contact the journal with an email and abstract.)
- ▶ Plan the writing of the different sections.
- ▶ Consult „instructions for authors“ or Guidelines for authors“ (Format, length, number of keywords...)
- ▶ Use the journal's „guidelines for authors“ to create a style sheet (Fig. or FIG., abbreviations, ...)
- ▶ Read articles in your journal. Note the number of paragraphs in sections.
- ▶ Print one article and use as an example to follow.

Impact factor

- ▶ „ An impact factor is a measure of the frequency with which the „average article“ in a journal has been cited in a particular year or period.“ (Garfield, 1994)
- ▶ Thompson Scientific calculates the impact factor
- ▶ www.isiwebofknowledge.com or www.sciencegateway.org/rank/index.html
- ▶ Impact factor vs. visibility

Role model article from your journal

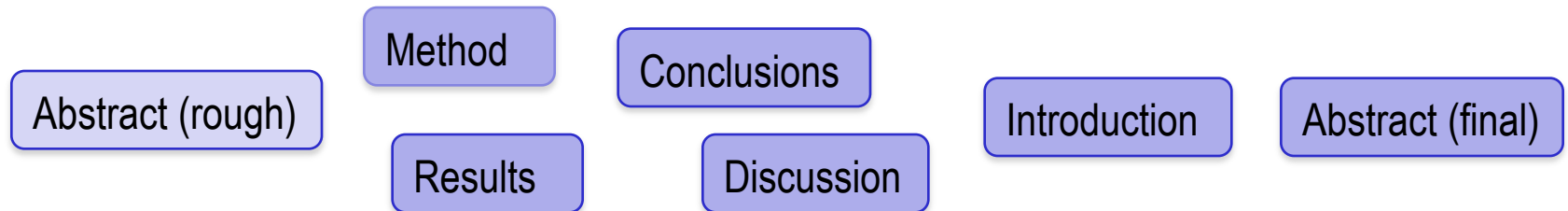
- ▶ **Choose** a paper close to your topic written by a native speaker.
- ▶ **Observe:**
 1. How does the author begin?
 2. What points are made in each section?
 3. How are paragraphs linked together?
 4. How are the results and discussion connected?
 5. How are the conclusions presented?
- ▶ **Note** down useful English phrases

Sections of a scientific manuscript and the information they contain

- ▶ Title page (Title, affiliations, abbreviations and keywords)
- ▶ Abstract, summary or synopsis (Take-home message)
- ▶ Introduction (What is my theme and why am I interested in it?)
- ▶ Materials and methods, experimental procedures (How)
- ▶ Results (What did I do and did I find out?)
- ▶ Discussion (What does it mean?)
- ▶ Acknowledgements (Who provided advise and materials, who paid for the work?)
- ▶ References (Whose work is my research based on?)
- ▶ Tables (The data)
- ▶ Figure legend (Provide essential information)
- ▶ Figures (The data)

Where do you start?

- ▶ **Figures?** Biology, medicine... Start with the data
- ▶ **Methods?** Easiest to write... Gain confidence.
- ▶ **Results?** Know what the outcome is first.
- ▶ **Abstract?** Forces you to focus your ideas on key aspects of your research.



Initial structure

- ▶▶ Brain storming – collect all the content - topics, ideas, methods...
- that should be included in the text. Write the bullet points or phrases on post-it notes or cards.

- ▶▶ Cluster topics / develop outline structure

- ▶▶ For each topic in the outline, complete the following sentences:
 - ▶ Objective of this section is
 - ▶ I will achieve this objective by ...

Drafting the „introduction“

- ▶▶ After writing the „results“ and „discussion“, you should have focused on a precise area of your field.
 - ▶ **First** paragraph outlines the overall scientific area.
 - ▶ **Second** paragraph introduces the specific part of the field investigated in the manuscript.
 - ▶ **Third** paragraph poses hypothesis or research question and briefly outlines the results and conclusions.

- ▶▶ Verb tenses are present and past:
 - ▶ **Present:** general statements
 - ▶ **Past:** to describe what you did

Drafting the introduction

Research paper

- ▶▶ **Move 1:** Establish a research territory
 - ▶ By showing that the general research area is important, central, interesting, problematic...
 - ▶ By introducing and reviewing items of previous research in the area

- ▶▶ **Move 2:** Establish a niche
 - ▶ By indicating a gap in the previous research, or by extending previous knowledge.

Drafting the introduction

Research paper

- ▶▶ **Move 3:** Occupy the niche
 - ▶ By outlining the purpose or stating the nature of the present research
 - ▶ By listing research questions or hypotheses
 - ▶ By announcing principal findings
 - ▶ By stating the value of the present research

Writing the „results“

- ▶▶ What did I do and what did I find out?
- ▶▶ Provide just enough information to understand:
 - ▶ the interpretation of each investigation and
 - ▶ why the following investigation is necessary.
 - ▶ (the rest is in the „discussion“).
- ▶▶ Results section must be coordinated with figures.
- ▶▶ **Generally, use past tense in the results section.**
- ▶▶ **If possible, use an active voice. It is clearer and stronger.**

Drafting the „discussion“

- ▶ „Results“ describes what you observed or measured.
- ▶ In the **discussion section**, you can answer the following questions:
 - ▶ How do your findings relate to the present state of knowledge in the literature?
 - ▶ How does your work contribute to existing knowledge?
 - ▶ Do you wish to give further details or interpretation of an experiment?
 - ▶ Did you answer your research question?
 - ▶ What have other authors published that impacts your question?
 - ▶ What is the evidence in favor of your hypothesis and what speaks against it?

Drafting the „discussion“ - pitfalls

- ▶▶ All tenses are found in the „discussion“.
 - ▶ **Past tenses** – when you refer to what you found in the literature or in your manuscript.
 - ▶ **Present tenses** – for explanations of your observations or the implications of your work.
 - ▶ **Future tenses** – for work which you propose to do in addition to the work described.

- ▶▶ Do not start the „discussion“ by referring to other people’s work.
- ▶▶ The „discussion“ is not a review.
- ▶▶ Do not give a long list of studies that should or could be done in the future. (Reviewers may want them.)

The „materials and methods“ section

- ▶ „**materials and methods**“ should have enough detail so other investigators can repeat the study.
- ▶ (scientists want to be able to *verify* findings.)

- ▶ **This section is generally written in the past tense.**
- ▶ Sentences must be complete and linked logically to each other.
- ▶ Save space by referring to previous publications or published methodologies.

„Title“, „abstract“, „key words“

- ▶▶ Editors use „title“ and „abstract“ to decide if the article should be reviewed!
Visiting card of your manuscript.
- ▶▶ Write the „**abstract**“ at this point, so it can undergo several rounds of editing.
- ▶▶ **Tense** is primarily **past simple**. **Present tense** is used **in the final sentence to state the conclusion of the work**. (stress take-home message)
- ▶▶ „**Title**“ should state the contents of your manuscript. (no abbreviations, if possible)
 - ▶ Look at titles of articles found in your selected journal.
 - ▶ Do you notice a certain style?
 - ▶ Are they comprehensible? Interesting?
- ▶▶ „**Key words**“ are not found in the title. This extends the search possibilities.

Finally „acknowledgements“ and „abbreviations“

- ▶ Keep the „acknowledgements“ simple. „We thank Ms.Jones for critical reading.“
- ▶ Always mention the funding agency.
- ▶ Check „instruction for authors“ about standard abbreviations.

List and sort references

- ▶▶ Any sentence that refers to the work of others requires a citation.
- ▶▶ General knowledge does not need to be cited.
- ▶▶ Cite review articles (secondary literature) in the introduction. Do not use them to refer to specific methods or particular results.
- ▶▶ Remember to cite articles that are published in your selected journal!

- ▶▶ Use a citation program – Endnote, Reference Manager, ...
- ▶▶ Import references directly from literature databases.
- ▶▶ Check!

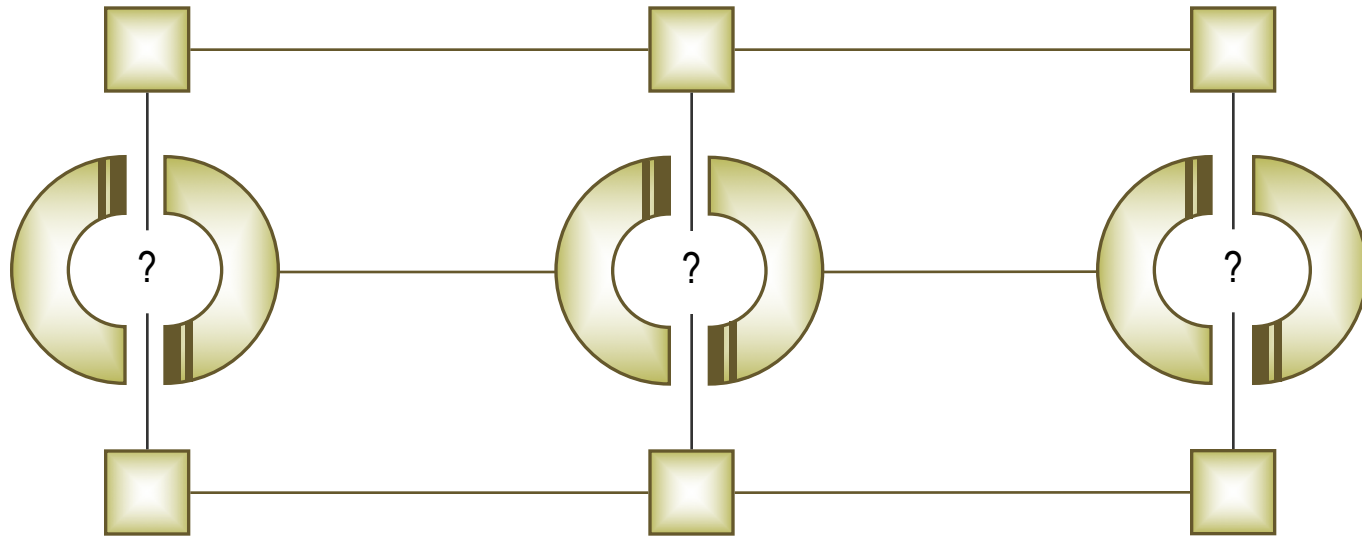
Keep the referee in mind

- ▶ Volunteers, may not have specific background knowledge in your area
- ▶ **Referee forms** (for example):
 1. Is the research novel and of international relevance?
 2. Does the article fit the aims and scope of the journal?
 3. Is the paper written grammatically and clearly?
 4. Is the writing style succinct?
 5. Is the title appropriate to the content?
 6. Does the abstract accurately describe the content?
 7. Are the conclusion borne out by the evidence?

What are editors looking for? Review articles in your journal

Criteria	Reviewers look for:
Type of paper	Original research, review, position paper
Subject	Current, original, innovative, controversial topics
Aim	Clear research objectives
Research	Well conducted, sound data, methodology, no bias, limitations recognized
Results	Reflect research objectives, new or confirm results in other papers from same journal, not too broad
Style	Personal (we/I), impersonal (passive form), mix

Revising and Editing



Revising

- ▶▶ The writing aspect of scientific research is exhausting ... I have rewritten many parts of papers four to six times, restructuring the entire organization, before I finally became satisfied.
-- Hermann Helmholtz
- ▶▶ Revision is the key to strong scientific writing.
- ▶▶ Before revising, find some distance to the text.
- ▶▶ Make the revision process different from the writing process:
 - ▶ You are no longer building, you are chiseling, polishing.
 - ▶ Work in a different place
 - ▶ On paper vs. at the computer
 - ▶ Try to work on large chunks in each sitting.
 - ▶ Get some distance between revisions.
 - ▶ Solicit criticism of your writing.

Editing a mix of problems...

- ▶ **Structure:** get the structure of the story in shape. (OCAR?, IMRD?)
- ▶ **Clarity:** ensure that your ideas are clear and concrete.
- ▶ **Flow:** make the ideas flow, linking one thought to the next.
- ▶ **Language:** wording, grammar, punctuation.
- ▶ These are intertwined, which means you will have to make many passes through the text.
- ▶ Start with structure and work down to language.

1. Editing for content

Types of Editing

▶▶ **Editing for Content**

What message does the author intend?

Considers accuracy and completeness of the information.

- ▶ Information correct?
- ▶ Information complete?
- ▶ Information appropriate for the audience?
- ▶ Information appropriate for the purpose?
- ▶ Information acceptable for distribution?

2. Editing for style

Types of Editing

- ▶ **Editing for style**
- ▶ **How well is the message presented?**
 - ▶ Organization sound? Are the details organized logically?
 - ▶ Transitions smooth? Are transitions made between details?
 - ▶ Emphasis proper? Are key details emphasized?
 - ▶ Illustrations clear?
 - ▶ (Language clear?)

3. Editing for form

Types of Editing

- ▶ **Editing for form**
How the document looks.
 - ▶ Format consistent?
 - ▶ Grammar correct?
 - ▶ Punctuation correct?
 - ▶ Usage proper?
 - ▶ Spelling correct?

Editing tips (for your own work)

- ▶ Rewrite and redraft on a printout.
- ▶ Save deleted sections in a separate file for use in future research publications.

- ▶ **Content questions:**
- ▶ Do the separate sections fit together coherently?
- ▶ Are sections consistent with each other?
- ▶ Does the „discussion“ contain too much speculation?...

- ▶ **Copy editing questions:**
- ▶ Review Gopen and Swan rules of topic and emphasis position.
- ▶ Check for formal style.

Editing (someone elses) written work

First „go over“:

- ▶▶ Read rapidly, obtain an overview
- ▶▶ Mark spelling mistakes, informal expressions
- ▶▶ Underline sentences that require a linking word.
- ▶▶ Ask yourself: Do I understand what is meant? If not, mark text.

Editing written work

Second „go over“

If you feel that you understand the text, then read it slowly and carefully. Ask yourself the following questions:

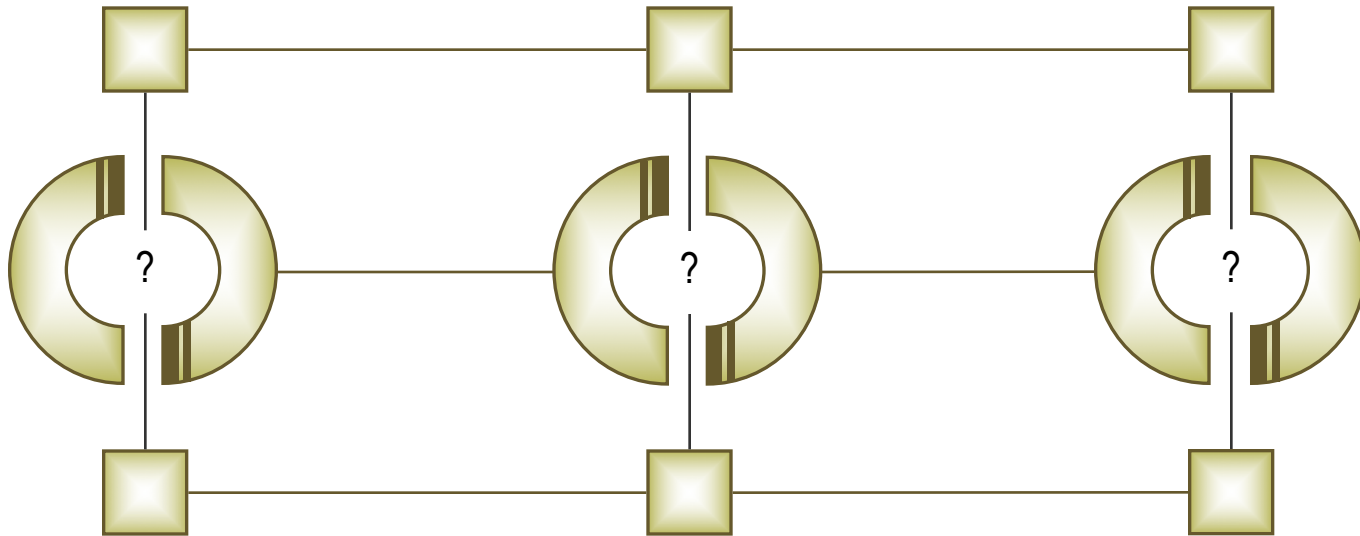
- ▶▶ Do the paragraphs have topic sentences?
- ▶▶ Are all the sentences straightforward and simple? Do they make sense?
- ▶▶ Do all the sentences fit together? Are they linked with the correct words?
- ▶▶ Are there expressions that are repeated throughout the text?
- ▶▶ Are there needless words?

Editing written work

Third „go over“

- ▶ Proof reading. Start at the end and read the manuscript backwards. Paragraph by paragraph.
- ▶ Ensures that the beginning and end are written in the same style.
- ▶ For long texts, it is easy to run out of steam half way through. Second half may not receive enough scrutiny.

Develop an abstract



Purpose of abstract

From idea to text

- ▶▶ An abstract helps readers to:
 - ▶ **decide** if they should read an article.
 - ▶ **remember** key findings.
 - ▶ **understand** a text by acting as a pre-reading outline of key points.
- ▶▶ **Index** articles for quick recovery and cross-referencing.

Components of an abstract

From idea to text

- ▶ **1. Motivation / problem statement:**
 - ▶ Why do we care about the problem?
 - ▶ What practical, scientific, theoretical or artistic gap is your research/project filling?

- ▶ **2. Methods / procedure / approach:**
 - ▶ What did you actually do to get your results?

- ▶ **3. Results / findings / product:**
 - ▶ As a result of completing the above procedure, what did you learn/invent/create?

- ▶ **4. Conclusion / implications:**
 - ▶ What are the larger implications of your findings, especially for the problem/gap identified in step 1?

Types of opening sentence

From idea to text

- A. Real World Phenomenon or Standart Practice
- B. Purpose or Objective
- C. Present Researcher Action
- D. Problem or an Uncertainty

Continuing ...second sentence

From idea to text

- ▶ Continuing Subject (Keep the same Subject)
- ▶ Capturing the Subject (Refers to emphasis position)
- ▶ New Subject (previously unmentioned topic)

Results – How do you organize your results?

From idea to text

- ▶ **General results first, followed by specifics**
- ▶ The data confirmed the results of sensory evaluations and showed the ability of wild lactobacilli to generate key volatile compounds. **Particularly**, three wild lactobacilli strains...
- ▶ **Specific results followed by a short result summary**
- ▶ There are three major findings. First,... Second,...Third,... **In sum**, high quality teacher-child relationships foster children's achievement.

Results „that“ clause

- ▶ „**That**“ clause gives more emphasis to findings of study
- ▶ Allows author to use a verb that indicates the strength of the claim.
- ▶ **This research** shows **that** junior scholars often need help with their abstracts.
- ▶ **The results** offer clear evidence **that** global warming is a reality.

Conclusion – Positive and definite conclusions

Strong statements with strong verbs:

- ▶ We . . . conclude that the **new methods can be applied** to the calculation of large rotations.
- ▶ The general characteristics . . . **demonstrate the capability** of the proposed procedure for locating sources of . . .
- ▶ The algorithm developed by . . . is found **to be a robust, fast and efficient method** for detecting . . .
- ▶ **The accuracy and efficiency** of . . . approach **was verified** by analyzing the . . .
- ▶ Through the simulations, **it is clearly demonstrated** that MATES is a **powerful tool** to study complex city traffic problems precisely.

Source: Computer Modeling in Engineering and Science

Literature

Technical writing:

- ▶ „Successful Scientific Writing – a step-by-step guide for the biological and medical sciences“, by J. Matthews & R. Matthews
- ▶ „The Elements of Technical Writing“, by G. Blake & R. Bly
- ▶ „Handbook of Technical Writing“, by G. Alred, C. Brusaw, W. Oliu
- ▶ „Scientific Writing and Communication“, by A. Hofmann

Grammar and style:

- ▶ „The Elements of Style“, by W. Strunk & E. B. White
- ▶ „The Little Red Writing Book“, by B. Royal
- ▶ „On Writing Well“, by William Zinsser
- ▶ „A writer’s guide to transitional words and expressions“, by V. Pellegrino

Writing textbooks with exercises

- ▶ „Academic Writing for Graduate Students“, by J. Swales & C. Feak
- ▶ „Writing Scientific English – A Workbook“, by T. Skern

Literature

Writing a thesis

- ▶ „How to Write a Thesis“, by R. Murray
- ▶ „A Manual for Writers of Research Papers, Theses, and Dissertations“, by K. Turabian
- ▶ „The Craft of Research“, by W. Booth, G. Colomb, & J. Williams

Writing and editing

- ▶ „The Craft of Scientific Writing“, M. Alley
- ▶ „The Craft of Editing“, M. Alley
- ▶ „Writing Scientific Research Articles“, by M. Cargill & P. O'Connor
- ▶ „Writing Science: How to write papers that get cited and proposals that get funded“, by J. Schimel
- ▶ „Abstracts and the Writing of Abstracts“, by J. Swales & C. Feak
- ▶ „English for Writing Research Papers“, A. Wallwork

Books about writing in German

- ▶ „Von der Idee zum Text“, by H. Esselborn-Krumbiegel
- ▶ „Kreatives Schreiben – von Diplom- und Doktorarbeiten“, by L. v. Werder
- ▶ „Keinen Angst vor dem Leeren Blatt“, by O. Kruse

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