Scientific English

M2 Marine Physics

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Lecture

Introduction

- Brief history of Science and scientific writing

Scientific writing

- Structure and content of a paper
- Writing and revision papers
- Writing reports, proposal, etc ...

Effective Scientific writing

- How to write more effectively

The peer-review process

- What? And How?

Activities

- Read and discuss scientific articles
- Write a short article
  Due date: **Dec. 5th**
- Review articles
  Due date: **Dec. 12th**

Material available at: http://ocean.fsu.edu/~qjamet/share/Scientific_English/

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Tentative paper instructions

Text requirements for your paper:

- 6 publication units (1 PU = 500 words or 1 figure or table)
- Using a standard structure:
  - Abstract
  - Introduction
  - Methods
  - Results
  - Conclusion
- Use Overleaf, Curvenote, Authorea, LaTex or Microsoft Word templates available here: *https://www.agu.org/publications/authors/journals*

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How to write more effectively

I. Subjects and Actions

II. Cohesion, Coherence and Emphasis

III. Concision and Simplicity

IV. A few grammar tips

V. Writing and self-revising (summary)

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III. Concision and Simplicity

Being simple is an efficient way to convey an idea

- Short sentence
- Simple words
- Avoid terms with vague meaning
- **Incomprehensible (or difficult to understand) sentence can convey false ideas**!

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III. Concision and Simplicity

3 Main principles:

- Omit needless words (#1)
- Prefer simple words (#2)
- Use simple subjects (#3)
- Use adjectives/adverbs frugally (#4)

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III. Concision and Simplicity

Principle 1: Omit needless words

Ask yourself: what this word adds?

→ You may be surprise at how many are unnecessary

“Cut the crap!”

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III. Concision and Simplicity

Principle 1: Omit needless words

Some examples:

Examples:	
Note that	Be advised that
It should be noted that	It is interesting to note
So-called	Needless to say
It is important to realize	

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III. Concision and Simplicity

Principle 1: Omit needless words

Some examples:

Instead of	*Write*
The question as to whether	
whether or not	
There is no doubt but that	
In a careful manner	
This is a subject that	
A large majority of	
has the capacity to	
Are in agreement	

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III. Concision and Simplicity

Principle 1: Omit needless words

Some examples:

Instead of	*Write*
The question as to whether	whether
whether or not	whether
There is no doubt but that	doubtless
In a careful manner	carefully
This is a subject that	This subject
A large majority of	most
has the capacity to	can
Are in agreement	agree

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III. Concision and Simplicity

Principle 1: Omit needless words

Some examples:

Instead of	*Write*
Prior to	
Subsequent to	
At this point in time	
Due to the fact that	
In the event that	
For the purpose of	
As a matter of fact	
In the near future	

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Principle 1: Omit needless words

Some examples:

Instead of	*Write*
Prior to	Before
Subsequent to	After
At this point in time	Now
Due to the fact that	Because
In the event that	If
For the purpose of	if
As a matter of fact	actually
In the near future	soon

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III. Concision and Simplicity

Principle 1: Omit needless words

Some examples:

Instead of	*Write*
With the exception of	
In conjunction with	
In the absence of	
Is of the opinion that	
As regards	
With respect to	
With regard to	

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III. Concision and Simplicity

Principle 1: Omit needless words

Some examples:

Instead of	*Write*
With the exception of	except
In conjunction with	and
In the absence of	without
Is of the opinion that	Thinks that
As regards	about
With respect to	about
With regard to	about

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III. Concision and Simplicity

Principle 1: Omit needless words

Some examples:

As discussed, the second reaction is really the end result of a very large number of reactions. It is also worth emphasizing that the reactions do not represent a closed system, as r appears to be produced out of thin air. In reality, it is created from other chemical species within the cell, but we have chosen here not to model at such a fine level of detail. One detail not included here that may be worth considering is the reversible nature of the binding of RNAP to the promoter region. It is also worth noting that these two reactions form a simple linear chain, whereby the product of the first reaction is the reactant for the second.

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III. Concision and Simplicity

Principle 1: Omit needless words

Some examples:

As discussed, the second reaction is ~~really~~ the ~~end~~ result of a ~~very~~ large number of reactions. ~~It is also worth emphasizing that~~ However, the reactions do not represent a closed system, as r appears to be produced out of thin air. In reality, it is created from other chemical species within the cell, but we ~~have chosen here~~ choose not to model at such ~~a~~ fine ~~level of detail~~resolution. One detail not included here ~~that may be worth considering~~ is the reversible nature of the binding of RNAP to the promoter region. ~~It is also worth noting that~~ these two reactions form a simple linear chain, whereby the product of the first reaction is the reactant for the second.

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III. Concision and Simplicity

Principle 1: Omit needless words

Revision Technique:

At first, you will use needless words!

Search for them, try without and see if the meaning has changed.

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Principle 2: Prefer simple words

Never use a complex word when a simple word will do.

"*Bad writers consider long words more impressive than short ones, and use words like usage instead of use or methodologies instead of methods without knowing what they mean.*" (John Lynch)

Example:

Method: *A way of doing something*
Methodology: *The system of methods followed in a particular discipline.*

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Principle 2: Prefer simple words

This applies to many other words

Instead of	*Write*
usage	use
utilize	use
elucidate	show
methodology	method
etiology	cause

Revision Technique:

Search for them and replace! (This will come with practice)

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These approaches use different kinds of methodology.

These approaches use different methods.

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Principle 3: Use simple subjects

Complex subjects = increased distance between subject and verb

Often, science writers want to accomplish too much in a single sentence:

- **define** a complex abstract entity (the subject)
- and then **describe** something that it does.

Try to split these tasks into multiple sentences. Some to define the subject and others to describe what it does.

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Principle 3: Use simple subjects

Often complex subjects encapsulate actions in a modifying phrase:

The sequences that had passed our filtering, trimming and alignment with ClustalX, where scanned for conserved elements across mammals.

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Principle 3: Use simple subjects

Often complex subjects encapsulate actions in a modifying phrase:

	**The sequences that had passed our filtering, trimming and alignment with ClustalX**, where scanned for conserved elements across mammals.
	The sequences were filtered, trimmed and aligned with ClustalX. **The resulting alignments** where scanned for conserved elements across mammals.

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Principle 3: Use simple subjects

Revision Technique:

Find the subject and the verb.

If they are too far apart, try to simplify by:

- Describing the subject in a dedicated sentence
- Ascribe it a ‘reference’, e.g. summarizing nominalization
- Removing modifying clauses
  (they can be placed in a dedicated sentence as well!)

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Principle 4: Use adjectives/adverbs frugally

In scientific writing, every experiment is "very innovative",
every result "very interesting", and every conclusion "very important”.

When "very" isn't enough, you'll find "extremely.”

Often, these words can be omitted without effect.

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Principle 4: Use adjectives/adverbs frugally

Example:

The simulation is run at **very** high-resolution

Very here will not refer to the same resolution for climate modellers, coastal oceanographers or fluid mechanics physicists.

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III. Concision and Simplicity

Principle 4: Use adjectives/adverbs frugally

- **The *repetition* problem:**

Avoid using several words that convey the same idea

Example:
completely and utterly alone
An interesting and intriguing finding
An improved and modified protocol

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III. Concision and Simplicity

Principle 4: Use adjectives/adverbs frugally

- **The *repetition* problem:**

Avoid using several words that convey the same idea

Examples:	
Close proximity	Close scrutiny
Added bonus	Combine together
Exactly the same	Surrounded on all sides
Prior experience	Exact replica
A new invention/innovation	Future plans
Revert back	Minute detail

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III. Concision and Simplicity

Principle 4: Use adjectives/adverbs frugally

- **Excessive Hedging:**

It's good to be humble, but it's easy to go too far.
Excessive hedging erodes the confidence of your results.

These results suggest ~~that~~ our method ~~may possibly~~ can identify ~~putative~~ enhancer elements.

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III. Concision and Simplicity

Principle 4: Use adjectives/adverbs frugally

- **Demeaning adverbs**

Be careful of demeaning words, e.g. "obviously", "clearly", or "undoubtedly". Something that is obvious to you may not be obvious to the reader.

- **Self-aggrandizement**

Be especially cautious of using words like "very" or "extremely" when lauding the merits of your study.

Here, we describe an exciting new groundbreaking method to...

Good science should speak for itself.

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III. Concision and Simplicity

Principle 4: Use adjectives/adverbs frugally

Revision Technique:

Highlight all adjectives and adverbs.
For each, ask if it contributes a meaningful idea.

Do a specific search for commonly overused appendages

"**very**", "**extremely**", "**clearly**",

and remove them.

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We **estimated** that **as much as 12-18% (depending on the tissue)** of inter-species differences in gene expression levels **might be** explained, **at least in part**, by changes in DNA methylation patterns.

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III. Concision and Simplicity

We **estimated** that **as much as 12-18% (depending on the tissue)** of inter-species differences in gene expression levels **might be** explained, **at least in part**, by changes in DNA methylation patterns.

Differences in DNA methylation could explain 12-18% of differences in gene expression.

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	Epigenetic events contribute to the etiology of diabetes; however, the lack of epigenomic analysis has limited the elucidation of the mechanistic basis for the link.
	Epigenetic problems can cause diabetes, but how?

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III. Concision and Simplicity

	Epigenetic events contribute to the etiology of diabetes; however, the lack of epigenomic analysis has limited the elucidation of the mechanistic basis for the link.
	Epigenetic problems can cause diabetes, but how?

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III. Concision and Simplicity

Revising your manuscript in 7 steps:
[https://cgi.duke.edu/web/sciwriting/index.php?action=qt-7steps]

1) Underline all nominalizations.
   Take a closer look at these words to see if they should be changed to verbs.

2) For each sentence, ask "what is this sentence about?"
   Is that the subject of the sentence?

3) For each sentence, find the part of the sentence that links to the previous sentence. Is it at the beginning or the end of the sentence?

4) For each paragraph, summarize the main point of the paragraph.
   Make sure each sentence in the paragraph supports the main point.
   Check to see if the first sentence and the last sentence discuss the same topic.

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III. Concision and Simplicity

Revising your manuscript in 7 steps:
[https://cgi.duke.edu/web/sciwriting/index.php?action=qt-7steps]

5) Read aloud or use text-to-voice to read your paper.
Listen for sentences that lose you.

6) Give your manuscript to an intelligent outside reader,
and ask him where he gets lost.

7) Do a text search for words or phrases that add little
(very, it should be noted, the fact, framework, mechanism, utilize, usage, methodology, methodologies...)