Style in Scientific Writing

Have something to say, and say it as clearly as you can. That is the only secret of style.

Matthew Arnold

Write clearly.
Aim for transparency.

There is now no effective mechanism for introducing into the initiation and development stages of reporting requirements information on existing reporting and guidance on how to minimize burden associations with new requirements.

Which is clear?
- Our lack of pertinent data prevented determination of committee action effectiveness in fund targeting to areas of greatest assistance need.
- Because we lacked pertinent data, we could not determine whether the committee had targeted funds to areas that needed assistance the most.

1st principle of clear writing
State who’s doing what in the subject of your sentence, and state what that “who” is doing in your verb.
2nd sentence names who acts in the subject of each clause, and tells in specific verbs what those actors do.

- we lacked
- we could not determine
- the committee targeted
- areas needed

Readable, Transparent Writing

5 Targets with exercises

- Nominalizations
- Compound noun phrases
- Point of view
- Verbosity
- Sentence length

Nominalizations

Verbs changed to another part of speech, particularly a noun.

Nominalizations

<table>
<thead>
<tr>
<th>Verb</th>
<th>Nominalization</th>
</tr>
</thead>
<tbody>
<tr>
<td>investigate</td>
<td>investigation</td>
</tr>
<tr>
<td>discover</td>
<td>discovery</td>
</tr>
<tr>
<td>perform</td>
<td>performance</td>
</tr>
<tr>
<td>impair</td>
<td>impairment</td>
</tr>
<tr>
<td>respond</td>
<td>response</td>
</tr>
<tr>
<td>deny</td>
<td>denial</td>
</tr>
</tbody>
</table>

Typical Patterns of Nominalizations
Subject + Empty Verb + Object

The data are proof of the thesis.

There was agreement in the committee.

Analysis of the issue was done by the author.
Returning Nominalizations to Verbs

The data are proof of the thesis. The data prove the thesis.
There was agreement in the committee. The committee agreed.
Analysis of the issue was done by the author. The author analyzed the issue.

Nominalizations garble up sentences, fog the meaning.

Cure: Change the nominalization back to a verb.

There will be a suspension of these programs by the dean until his reevaluation of their progress has occurred.
The dean will suspend these programs until he reevaluates their progress.

We conducted an investigation of the matter.

We investigated the matter.

A review was done of the relevant regulations.
We reviewed the relevant regulations.

There has been the exercise of effective staff information dissemination control on the part of the secretary.

The secretary has effectively controlled the way the staff disseminates information.

Compound noun phrases

NOUN PILE

noun + noun + noun +...

Some noun phrases are useful

- stone wall
- student forum
- radio telescope

The problem:

- Early childhood thought disorder misdiagnosis often occurs when physicians are unfamiliar with recent research literature….
- Cure: unpack the nouns.
- Method: reverse the order of the nouns, rewriting the string into prepositional phrases.
Early childhood thought disorder is being misdiagnosed, as physicians are unfamiliar with recent literature on the topic. This misdiagnosis is likely due to a lack of knowledge in young children, leading to incorrect diagnoses.

Pancreatic gland motor phenomena are regulated chiefly by parasympathetic nervous system cells.

Phenomena involving the pancreatic gland are regulated chiefly by cells in the parasympathetic nervous system.

The art of cardiac sound interpretation requires an intimate knowledge of cardiac physiology and pathophysiology of cardiac disease.

In order to interpret cardiac sounds, one must know intimately cardiac physiology and the pathophysiology of cardiac disease.

Point of view

Personal or impersonal?
First person in scientific writing

- Tradition is changing.
- First person is often shorter, simpler, and less pompous.
  Eg. “The authors wish to thank…,” or “The authors are prepared to argue…”

First person can be less confusing.
Who did what? Whose results are whose?

Confusing: This result was elucidated by Smith (1990) and Jones (1991). In these studies, the authors found inconsistencies in the results. It was found that the data differed slightly.

Better: Smith (1990) was the first to explain this result; Jones (1991) expanded upon the idea. Our research uncovered minor inconsistencies in the data given in both of their studies.

Use first person consistently and correctly.
Avoid illogical shifts in point of view.

Inconsistent:
- We have reached the point where one should do further experiments.

Better:
- We have reached the point where we should do further experiments.

Correct the point of view

- The laboratory technician will find that the new procedure is an improvement; you will not need to sterilize the skin.

Correct the point of view

- Jones and colleagues showed that some bacteria do not emit molecular oxygen but the authors herein contend that they still photosynthesize.
Verbosity

Wordiness makes your writing less readable.

Simplify. Simplify.
It takes a long time to make it short.

“Sorry to write such a long letter, but I didn’t have time to make it short.”

“That” and “which” clauses are often overused--
and can garble up your sentences.

Question all prepositional phrases and clauses. Do you need them?

Wordy:
The organism that Chu (1993) found was a guppy that laid eggs.

Better:
The organism Chu (1993) found was an egg-laying puppy.

Wordy:
The dog with dysorexia was referred to a clinic in the neighborhood.
Better:
The dysorexic dog was referred to a neighborhood clinic.

Better:
Group one includes Coleus plants.

Better:
The calico’s sole offspring, the kitten lacked orange hair.

Revise for brevity

To determine the mobility activity of the organism, new state-of-the-art equipment was used.
Revision

To determine the organism's mobility, state-of-the-art equipment was used.

Revise for brevity

For a full and complete understanding of the impacts and ramifications of the hot temperature upon the organism, it is our personal opinion that future plans should include a chilling procedure.

Revision

To understand the effects of heat on the organism, we plan to chill it.

Revise for brevity

The total absence of visible color was absolutely unique.

Revision

The absence of color was unique.

Sentence length

For readability, most sentences in scientific prose should be about 15-20 words long.
Two canine cadavers with orthopedic abnormalities were identified which included a first dog that had an unusual deformity secondary to premature closure of the distal ulnar physis and a second dog that had a hypertrophic nonunion of the femur, and the radius and femur of both dogs were harvested and cleaned of soft tissues. [54 words in one sentence]

Two canine cadavers with orthopedic abnormalities were identified. The first dog had an unusual deformity. It was secondary to premature closure of the distal ulnar physis. The second dog had a hypertrophic nonunion of the femur. The radius and femur of both dogs were harvested. They were cleaned of soft tissues. [51 words in 6 sentences: average, 8.5 words per sentence]

Two canine cadavers with orthopedic abnormalities were identified. The first dog had an unusual deformity secondary to premature closure of the distal ulnar physis; the second, a hypertrophic nonunion of the femur. The radius and femur of both dogs were harvested and cleaned of soft tissues. [46 words in 3 sentences; average, 15.3 words per sentence.]

Variation in sentence length helps keep readers interested. Guidelines refer to averages.

A (tongue-in-cheek) key to understanding scientific writing

What the scientist said: “It has long been known that....”

What he meant: “I haven’t bothered to look up the original reference, but....”
What the scientist said: “Of great theoretical and practical importance....”

What he meant: “Interesting to me....”

What the scientist said: “It is believed that....”

What he meant: “I think....”

What the scientist said: “It is generally believed that....”

What he meant: “A couple of other guys think so, too.”

What the scientist said: “It is clear that much additional work will be required before a complete understanding....”

What he meant: “I don’t understand it.”

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