

Scientific Writing 6951

THE
ASTROPHYSICAL JOURNAL
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Wednesdays 10-12 Room 0.008

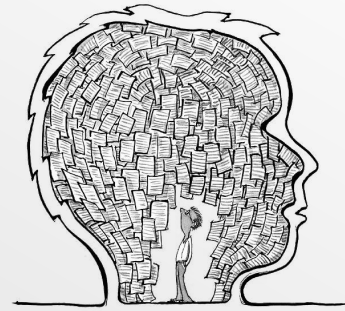


<http://www.astro.uni-bonn.de/~izzard/writing.html>

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Previously on *Scientific Writing*

- A picture says a thousand words



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Today: *Style* part 1 of 3

- Three classes covering
 - Syntax, punctuation
 - Fragments, Sentences, Paragraphs
 - Tenses, verbs, pronouns
 - Useless phrases, jargon, acronyms, complexity, ambiguity
 - Text flow, variety
- Sorry, *not the most exciting* subjects...
- But **very useful!** (And **you** asked for it :)

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Style Part I

- *Why* good style?
Readers have limited time and patience
- Errors either:
 - **Disturb.**
 - *Distract.*
 - **Are ignored.**

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Disturbing errors

- The worst kind! These *break* the text flow, may lead to *ambiguity* or – worse – are utterly *superfluous*.
Counting the number of stars in different stellar populations and comparing their relative populations is a useful method to measure stellar evolution.
- Disturbing because it *means nothing!*
- You are left asking *what the ?*
- “*Measure*” stellar evolution?

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Distraction

- Not so bad, but you notice and get **annoyed!**

Langeer and Maeder (1995)

The largest period binary is...

We study Betelgeuse but haven't studied Sirius

- These are easiest to fix!

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Small errors

- Often you read straight through them!

The affect on the Sun is to make it redder.

The material passed through the lagrange point.

It's problem is twofold, we do not know what it is and it can be complicated.

The next three classes

- Improve your *style* to prevent these “errors”
- Remember: style is usually **subjective** but there are *conventions* to follow
- Which vary depending on country, journal...
- Aims for today:
 - Fragments and Sentences
 - Paragraphs
 - Some grammar to use and avoid

Sentences

- The unit of communication!
- “A sentence is a group of words with a subject and a verb that expresses a complete thought”
- The star orbits its companion.
- The star orbits.
- This is a fragment, not a sentence

The orbiting star.

← **Adjective!**

Syntax

- Rules for building sentences from:
 - Fragments
 - Clauses
- Joining constructions
- *Style, phrasing, flow*
- Word choice! Very important in science:
 - **Impact** (say what you mean!)
 - **Ambiguity** (“effect”)
 - **Concise**

Fragment(ation)

- A sentence should stand on its own
- Several ground-based telescopes can detect $z=1$ galaxies. For example, Keck, Effelsberg and the WHT.**
- The first sentence is fine.
 - The second part is *not* a sentence, it is a *fragment*.
 - Suggest an improvement!

Clauses

- Clauses and subclauses lead to much pain
- Difficult to join: you have to practice!
- Remember **parallel phrasing**.
- Simple *conjunctions*:
The star is red. The star is hot.
The star is red **and** the star is hot.
(or *The star is red and hot.*)
- Others: *but, nor, for, yet, or, so*

Avoid starting a sentence with a conjunction!

<http://grammar.ccc.commnet.edu/grammar/conjunctions.htm>

Opening clauses

- Subject-verb: The *star exploded* ...
- Preposition, verb:
In less than a day, the star *had* disintegrated...
- Adverb: *Quickly*, the star disintegrated...
- Dependent clause:
Because the star was unstable, it blew up.
- Prepositional phrase:
Of all the stars in the cluster, only this star exploded.

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Opening clauses

- Infinitive phrase:
To be sure the star exploded, we fired missiles at it.
- Gerund:
Calculating the explosion likelihood was a job for the student.
- Dependent clause, subject:
How the star exploded, we do not know.

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Unpopular openers

- Adjective phrase:
Red and bright, the star was about to explode.
- Introductory series:
Red, bright and pulsating, the star was ready to explode.
- Apposition:
The largest star ever discovered, Betelguese will explode soon.

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Clause transition

- Punctuate between independent clauses
The galaxy is elliptical. Its stars are blue.
The galaxy is elliptical and its stars are blue.
The galaxy is elliptical but its stars are blue.
The galaxy is elliptical, but its stars are blue.

Comma here?

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Transitions

- **Addition** *again, also, and, first, ...*
- **Chronological** *after a while, since, until...*
- **Comparison** *similarly, likewise, ...*
- **Concession** *of course, naturally, ...*
- **Contrast** *although, and yet, notwithstanding...*
- **Emphasis** *in fact, of course, certainly...*
- **Example** *e.g., in other words, in short, ...*
- **Summary** *altogether, in summary, on the whole...*

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Weak transitions

- The star shines brightly. This means it will not live long.
- The star shines brightly. **Its rapid rate of nuclear burning** means it will not live long.
- Do not sacrifice **clarity** for **brevity**.

What is *this* ?

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Parallel phrasing

- The star **grew** then **exploded**.
- The star **grew** and then **was observed** to explode.
- The star was observed **to grow** and then **to explode**.
- The star was observed **to grow** and then **explode**.
- The star **grew** and then was seen **to explode**.

See today's exercises!

<http://www.chompchomp.com/terms/parallelstructure.htm>

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Sentence structure overview

- **Subject-verb**
"The rain flooded the town in minutes."
- **Prepositional phrase**
"In just minutes the rain flooded the town."
- **Adverb** *"Quickly, the rain flooded the town."*
- **Dependent clause** *"Although it was forecast to be dry, the rain quickly flooded the town."*
- **Infinitive phrase** *"To stay dry, the residents of the town did not go out when it was flooded."*
- **Parenthetical phrase** *"The residents of the town, to stay dry, did not go out when it was flooded."*

Mix it up!

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Verb tense and voice

- Usually only use the present tense
- Perhaps past for referring to previous work
- Active Voice:
 - *We visited the shops.*
- Passive Voice:
 - *The shops were visited by us.*
- Mix them up! Usually you want the active, but sometimes passive is better.
- Use active for the **first** and **last** sentence.

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Consistency

- e.g. **US vs UK vs Australian vs ... "Globish"**
- center - centre
- liter - litre
- color – colour
- catalyze – catalyse
- acknowledgment – acknowledgement
- cesium – caesium
- Traveling - travelling
- metallicity – metallicity (!)



https://en.wikipedia.org/wiki/American_and_British_English_differences

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Gender Bias

Consider:

- The telescope must be **manned** at all times.
- The telescope must be **staffed** at all times.

Nouns/Pronouns

- Each astronomer received **his** share of the Nobel prize.
- All the astronomers received **their** share of the Nobel prize.
- Being a postdoc is tough on the **wife and children**.
- Being a postdoc is tough on the **family**.



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Lengths of things

- Sentences:
 - Aim for **10-20 words**. Vary it!
 - Do not have many short sentences next to one another ("stacking").
 - More than 20 words: be careful.
- Paragraphs
 - 5-6 lines
 - A few short paragraphs are ok, do not stack
 - Long paragraphs are dull
- Whitespace orients the reader!
- Consider bullet lists etc.

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Homework

- Online exercises (try some of them!)
- *The Craft of Scientific Writing* Alley (Springer-Verlag, 1996)
<http://www.writing.engr.psu.edu/exercises/>
- Exercises on being fluid
<http://www.writing.engr.psu.edu/exercises/language5.html>
- Writing informative sentences:
http://www.writing.ucsb.edu/faculty/holms/writing_ENGR103.htm
- Parallel structure
<https://owl.english.purdue.edu/owl/resource/623/01/>
- Bias
<http://owl.english.purdue.edu/owl/resource/608/05/>