



Technical writing: clarity and grace

Before we begin...

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<http://ast.rono.me/files/presentations/writing>

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<http://www.ast.cam.ac.uk/~swt30/files/presentations/writing/slides.pdf>

What this workshop is not

Spelling mistakes and grammar

Lush prose

Dumbing it down

Paper structure

Writing your first draft

What this workshop is

Clarity

- Signal/noise ratio
- Actors and actions
- Untangling sentences
- Emphasizing information

Grace

- Coherence
- Connection
- Concision

"Write clearly"

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"Omit needless words"

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"Omit needless words"

"Consider your audience"

"Write clearly"

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"Omit needless words"

"Consider your audience"

"Avoid the dangling participle"

"Write clearly"

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"Omit needless words"

"Consider your audience"

"Avoid the dangling participle"

"Never end a sentence with a preposition"

Clarity 1: Signal and noise

The signal/noise ratio

Signal

Purpose

Strength of message

Compelling content

Effective figures

Logical structure

Reinforcement

Noise

Backtracking

Over-verbosity

Choppiness

Unusual words/acronyms

Mistakes

Visual noise

Root causes of bad writing

The final step in Lord Morris's preparation to introduce the precedents is his consideration of the idea of conviction despite the presence of duress and then immediate pardon for that crime as an unnecessary step which is in fact injurious for it creates the stigma of the criminal on a potentially blameless (or at least not criminal) individual.

Root causes of bad writing

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Others write badly and we imitate them

Bad sentences

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China, so that it could expand and widen its influence and importance among the Eastern European nations, in 1955 began in a quietly orchestrated way a diplomatic offensive directed against the Soviet Union.

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When pAD4038 in the *E. coli pmiimanA* mutant CD1 heterologously overexpressed the *P. aeruginosa pmi* gene, there appeared high levels of PMI and GMP activities that were detectable only when pAD4038 was present.

A photograph of a theater stage. The stage is covered with a red carpet and is framed by a large, ornate red curtain with a gold fringe. The stage is flanked by two pillars with decorative sconces. In the foreground, there are rows of wooden chairs and small round tables. A white text box is overlaid on the center of the image.

Clarity 2: Actors and actions

Beware nominalizations

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Name the actors in the sentence by making them subjects.

Beware nominalizations

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Name the actors in the sentence by making them subjects.

Name their actions directly by making them verbs.

Beware nominalizations

The **current estimate** is of a **50% reduction** in the **introduction of new chemical products** in the event that **compliance with the Preliminary Manufacturing Notice** becomes a **requirement** under **proposed new legislation**.

Name the actors in the sentence by making them subjects.

Name their actions directly by making them verbs.

If **the Government requires** that **the chemical industry comply** with the Preliminary Manufacturing Notice, **we estimate** that **the industry will introduce** 50% fewer new products.

Rewrite nominalizations

- | The police conducted an investigation into the matter.
- | There is a need for better candidate selection efficiency.
- | The discovery of a method for the manufacture of artificial skin will have the result of an increase in the survival of patients with radical burns.

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Rewrite nominalizations

- | The police conducted **an investigation** into the matter.
- | There is **a need** for better **candidate selection efficiency**.
- | **The discovery of a method for the manufacture of artificial skin** will have **the result of an increase in the survival of patients** with radical burns.
- | The police investigated the matter.
- | We need to select candidates more efficiently.
- | If researchers can discover how to manufacture artificial skin, more patients will survive radical burns.

Passive and active voices

- | The agreement was broken by the partners.
- | Follow-up images were obtained over several nights.

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- | The partners broke the agreement.
- | We obtained follow-up images over several nights.

Passive and active voices

- | The agreement was broken by the partners.
- | Follow-up images were obtained over several nights.
- | The partners broke the agreement.
- | We obtained follow-up images over several nights.
- | By March of 1945, the borders of Germany had been breached, and both Germany and Japan were being bombed around the clock.
- | By March of 1945, the Allies had breached Germany's borders and were bombing both Germany and Japan around the clock.

A close-up photograph of a thick red rope tied in a complex, multi-loop knot. The rope is a vibrant red color with a visible braided texture. The knot is dense and intricate, with several loops and crossings. The background is a plain, light-colored surface, possibly white or light gray, which makes the red rope stand out. The lighting is soft, creating subtle shadows and highlights on the rope's surface.

Clarity 3: Untangling sentences

How (not) to begin a sentence

Function	Text
Transition	And therefore
Metadiscourse	it is important to note that from a practical perspective
Location	in the North in recent years
Topic	sources of acid rain
Elaboration	have become a concern

And therefore, it is important to note that from a practical perspective, in the North in recent years, sources of acid rain have become a concern.

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Elaboration	have become a concern

And therefore, it is important to note that from a practical perspective, in the North in recent years, sources of acid rain have become a concern.

Sources of acid rain have therefore become a practical concern in the North in recent years.

Managing topics within sentences

Put familiar information up front

Our lack of knowledge about local conditions precluded determination of committee action effectiveness in fund allocation to those areas in greatest need of assistance.

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Our lack of knowledge about local conditions precluded determination of committee action effectiveness in fund allocation to those areas in greatest need of assistance.

Though these areas needed the most assistance, the committee did not know enough about local conditions to effectively allocate funds.

Managing topics within sentences

Put familiar information up front

Our lack of knowledge about local conditions precluded determination of committee action effectiveness in fund allocation to those areas in greatest need of assistance.

Though these areas needed the most assistance, the committee did not know enough about local conditions to effectively allocate funds.

This lack of knowledge meant that the committee could not effectively allocate funds to those areas needing the most assistance.

Managing topics within sentences

Use the passive voice where appropriate

Astronomers, physicists, and a host of other researchers entirely familiar with the problems raised by quasars have confirmed these observations.

These observations have been confirmed by astronomers, physicists, and a host of other researchers entirely familiar with the problems raised by quasars.

Managing topics within sentences

Flip the subject and complement

However, the source of the English attitude towards rural dialects is more interesting than this.

Figure 2 shows that the rate was lower at higher temperatures in most experiments.

More interesting than this, however, is the source of the English attitude towards rural dialects.

In most experiments, the rate was lower at higher temperatures (Figure 2).

Managing topics within sentences

Construct an introductory clause

An attorney who, after the close of such a discovery proceeding, uncovers any documents that might be even peripherally relevant to the proceeding must notify both the court and the opposing attorney immediately.

If a such a discovery proceeding closes and an attorney then uncovers documents that might be even peripherally relevant to the proceeding, she must notify both the court and the opposing attorney immediately.

Other tricks for tangled sentences

Keep connected parts of the sentence near each other

| John, who, when Sally arrived, had left, returned.

| Scientists the world over, because they deliberately write in a style that is aloof, impersonal, and objective, have difficulty communicating with laypeople.

Other tricks for tangled sentences

Keep connected parts of the sentence near each other

| John, who, when Sally arrived, had left, returned.

| Scientists the world over, because they deliberately write in a style that is aloof, impersonal, and objective, have difficulty communicating with laypeople.

| John had left when Sally arrived, but now he returned.

| Because scientists the world over deliberately write in a style that is aloof, impersonal, and objective, they have difficulty communicating with laypeople.

Other tricks for tangled sentences

Resumptive modifiers let you extend sentences

Perhaps there are interactions among the components of the system that would dictate one order rather than another.

Other tricks for tangled sentences

Resumptive modifiers let you extend sentences

Perhaps there are interactions among the components of the system that would dictate one order rather than another.

Perhaps there are interactions among the components of the system, interactions that would dictate one order rather than another.

Other tricks for tangled sentences

Some information is best conveyed in another format

The sensors were built on a silicon substrate prepared with 370 nm SiO_2 , and consist of a 215-nm-thick Ti/Pt heating element, 165-nm-thick TiW/Au electric contacts, and a 286-nm-thick SnO_x gas-sensitive layer.

Other tricks for tangled sentences

Some information is best conveyed in another format

The sensors were built on a silicon substrate prepared with 370 nm SiO₂, and consist of a 215-nm-thick Ti/Pt heating element, 165-nm-thick TiW/Au electric contacts, and a 286-nm-thick SnO_x gas-sensitive layer.

The sensors were built on a silicon substrate made of SiO₂ (370 nm). They consist of three layers:

layer	material	thickness
a heating element	Ti/Pt	215 nm
a set of electric contacts	TiW/Au	165 nm
a gas-sensitive layer	SnO _x	286 nm



Clarity 4: Emphasizing information

Ending sentences strongly

The end of the sentence is stressed

No-one can explain why the first primeval superatom exploded and thereby created the universe **in a few words.**

Ending sentences strongly

Shift less important information to the left

No-one can explain why the first primeval superatom exploded and thereby created the universe **in a few words**.

No-one can explain **in a few words** why the first primeval superatom exploded and thereby created the universe.

Ending sentences strongly

Chop off the end

Sociobiologists are making the provocative claim that our genes largely determine our social behavior in **the way we act in situations we find around us every day.**

Sociobiologists are making the provocative claim that our genes largely determine our social behavior.

Ending sentences strongly

Remove useless metadiscourse

The opportunities we offer are particularly rich at the graduate level, **it must be remembered.**

The opportunities we offer are, **it must be remembered**, particularly rich at the graduate level.

The opportunities we offer are particularly rich at the graduate level.

Ending sentences strongly

Split sentences to create emphasis points

The EPA will promulgate new standards for the treatment of industrial wastewater prior to its discharge into sewers, with pretreatment standards for types of industrial sources being discretionary, depending on local conditions, instead of imposing nationally uniform standards.

Ending sentences strongly

Split sentences to create emphasis points

The EPA will promulgate new standards for the treatment of industrial wastewater prior to its discharge into sewers, with pretreatment standards for types of industrial sources being discretionary, depending on local conditions, instead of imposing nationally uniform standards.

The EPA will promulgate new standards for the treatment of industrial wastewater prior to its discharge into sewers. The new standards will not be uniform across the whole nation. They instead will be discretionary, depending on local conditions.

Clarity: Summary

- Name the actors in your sentences explicitly by making them the subjects, and show their actions by making them the verbs.
- Where possible, avoid nominalizing verbs.
- Put familiar information (the topic) at the start of sentences.
- Keep related parts of sentences close to each other.
- Put new information at the end of sentences.
- Prefer active verbs, but don't be afraid of the passive voice if it helps you get your topic and emphasis in the right place.

Grace 1: Coherence

Topics and themes

Signal the topic at the beginning of the paragraph

Clark's practice of carefully mapping every fossil made it possible to follow **the evolutionary development of various types through time**. Beautiful sequences of antelopes, giraffes and elephants were obtained; new species evolving out of old and appearing in younger strata. In short, evolution was taking place before the eyes of the Omo surveyors, and they could time it. The finest examples of this process were in several lines of pigs which had been common at Omo and had developed rapidly. Unsnarling the pig story was turned over to paleontologist Basil Cooke. He produced family trees for pigs whose various types were so accurately dated that pigs themselves became measuring sticks that could be applied to fossils of questionable age in other places that had similar pigs.

Topics and themes

Keep your promises

Clark's practice of carefully mapping every fossil made it possible to follow **the evolutionary development of various types through time.**

Clark made it possible to follow the evolutionary development of various types through time because he **mapped every fossil carefully.**

It became possible to follow through time the evolutionary development of various types of fossil because of the careful mapping **done by Clark.**

Topics and themes

A cohesive paragraph has consistent topic strings

Clark's practice of carefully mapping every fossil made it possible to follow the **evolutionary development** of various types through time. Beautiful **sequences** of antelopes, giraffes and elephants were obtained; new species **evolving** out of old and appearing in younger strata. In short, **evolution** was taking place before the eyes of the Omo surveyors, and they could time it. The finest examples of **this process** were in several lines of pigs which had been common at Omo and had developed rapidly. Unsnarling **the pig story** was turned over to paleontologist Basil Cooke. He produced family trees for pigs whose various types were so accurately dated that pigs themselves became measuring sticks that could be applied to fossils of questionable age in other places that had similar pigs.

Topics and themes

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Topics and themes

Each paragraph should make a clear point

As you know, Abco is contemplating cooperating with Janeway to develop an electronic steering mechanism. Janeway has developed highly efficient hydraulic components including brake and stabilizing systems. We have found them entirely reliable and cost-effective. But Janeway's experience has primarily involved ignition and other engine components, not steering. An electronic steering mechanism will depend on an innovative marriage of electronics and hydraulics. Edwards has recently marketed a hydraulic lift system that depends on electronic sensors to read terrain features. Their systems have features that we will require in our steering mechanisms.

Topics and themes

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Abco should not cooperate with Janeway in developing a new steering mechanism because Edwards has more technical expertise.

Topics and themes

In scientific works, make your point early

The temperature-dependent behaviour in the previous section is not significantly affected when we **change the planet's water content** (Fig. 9). We constructed planetary models with water, silicate, and iron layers, fixing the silicate:iron mass ratio to the Earth value of 2:1 and **allowing the water shell to vary in mass**. These models correspond to an Earth-like nucleus with an **extended water layer** at the surface. The effects of surface temperature on radius are comparable in magnitude across all our models with **water layers**, even when we set the **water layer mass** to just 1 per cent of the mass of the entire planet. For a $10 M_{\oplus}$ super-Earth with a surface pressure of...

Topics and themes

Good paragraphs have thematic strings of words too

Topic strings focus your reader's attention on what a paragraph is globally about:

| ... **evolutionary development** ...

Thematic strings weave ideas related to the topic throughout your paragraph:

| ... evolutionary development of various types **through time**. Beautiful sequences of antelopes, giraffes and elephants were obtained; **new** species evolving out of **old** and appearing in **younger** strata. In short, evolution was **taking place before the eyes** of the Omo surveyors, and they could **time it**.



Grace 2: Connection

Serial and Parallel Links

Serial

All current implementations of the Diabolo algorithm are based on **the Angel transform**. **This transform**, first described by F. Angel, separates the data into **high and low values** before proceeding with generation. **The high and low values** are then stored separately...



Link with demonstrative adjective: *this, these, such...*

Serial and Parallel Links

Parallel

Codes based on the Diabolo algorithm have become increasingly popular. Compared to the traditional Demon codes, **they** are about twice as fast. **They** are also easy to implement and can be extended to handle hybrid transforms. However, **they** require about 45% more memory, but this is a less critical limitation with today's architectures...



Link with personal pronoun: *it*, *they*, *we*...

Grace 3: Concision



Compress what you mean

| In my personal opinion, we must listen and think over in a punctilious manner each and every suggestion that is offered to us.

| We must consider each suggestion carefully.

| During that period of time, the mucous membrane became pink in colour and shiny in appearance.

| During that time, the mucous membrane became pink and shiny.

Compress what you mean

Before

for the reason that

despite the fact that

under circumstances in which

it is necessary that

has the capacity to

it is possible that

After

because

although, even though

if, when

must

can

may, might, can, could

Cut metadiscourse

Hedges

usually, often, sometimes, almost, possibly, apparently, seems, for the most part, could, tend

Emphatics

a good deal, very, obviously, it is clear that, central, crucial, of course

Cut metadiscourse

Sequencers

in the next section, it is my intention to deal with, the first thing to note is

Attributors

we have concluded, we learned, is observed to, have been determined, are found to

Grace: Summary

- Signal a topic at the beginning of each paragraph, usually at the end of the first sentence.
- Use consistent topic and theme strings to provide the reader a guide through each paragraph.
- Keep the promise you make about what the topic will be.
- Use parallel and serial links to develop ideas.
- Discard redundant words.
- Search for shorter ways to say what you mean.
- Be careful with metadiscourse, which is often unnecessary.