

The Art and Science of Writing . How to write easy-to-read text?

Arnaud Legout

► **To cite this version:**

Arnaud Legout. The Art and Science of Writing . How to write easy-to-read text?. 3rd cycle. France. 2013. <cel-00879035v2>

HAL Id: cel-00879035

<https://cel.archives-ouvertes.fr/cel-00879035v2>

Submitted on 22 Jan 2015

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

The Art and Science of Writing

How to write easy-to-read text?

Arnaud Legout

Inria, Sophia Antipolis

arnaud.legout@inria.fr



This work is licensed under the Creative Commons BY-NC-SA License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-sa/3.0/>

cel-00879035, version 2, January 2015

What are the Well Known Advices You Already Know?

Write text where the
reader expects it to be

What is Writing?

- You need a good writing style
 - Write clear, easy-to-read, and pleasant text
- You need a convincing story
 - Structure of your document
 - Introduction, methodology, results, related work, conclusion, etc.
 - Structure of each part, chapter, and section

Part 1

Writing Style

Credit: most examples in this part are from “Style Lessons in Clarity and Grace” 10th edition, Joseph M. Williams, Gregory G. Colomb

Writing Style

- Sentences
- Glue between sentences (that is, the flow of idea) to form a paragraph
- Complex sentences

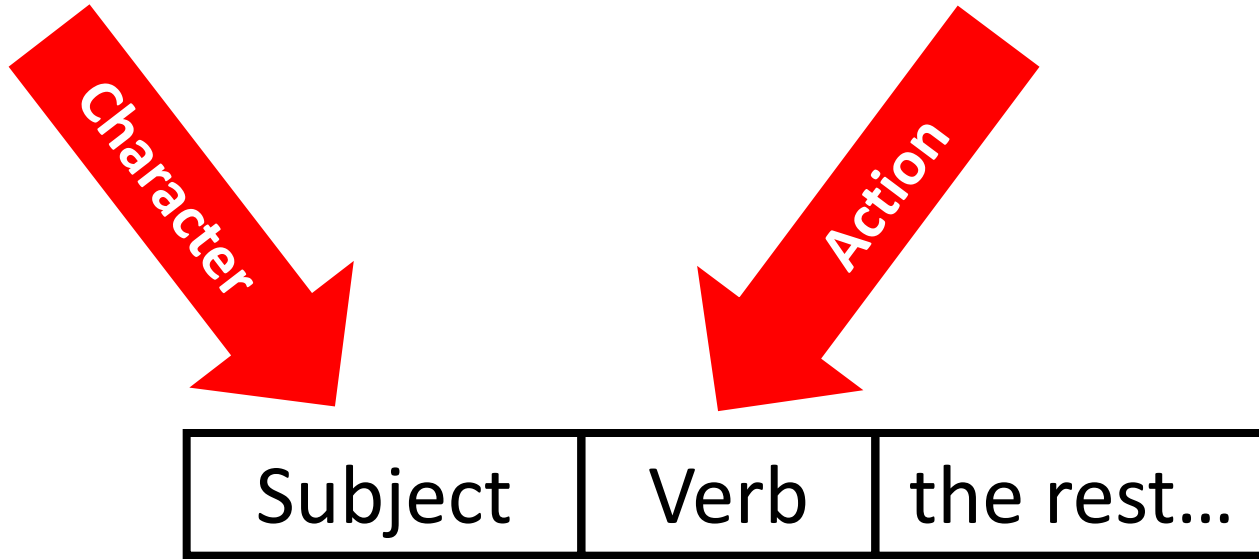
In a sentence subjects are
characters and verbs are
actions

Characters are close to verbs

Why a Sentence is Unclear?

It has been argued that a text an
✘ author is writing in a clear way
should be like the flow of a river.

What is a Clear Sentence ?



Authors Should Avoid Nominalization that are Actions

- A noun derived from a verb or adjective is called a nominalization
 - ✗ • “The outsourcing of high-tech work to Asia by corporations...”
 - ✓ • “Corporations are outsourcing their high-tech job to Asia...”
 - ✗ • “We did a review of the evolution of computers.”
 - ✓ • “We reviewed the evolution of computers.”

Examples

Our lack of data prevented evaluation of UN

✘ actions in targeting funds to areas most in need of assistance.

Because we lacked data, we could not evaluate

✔ whether the UN had targeted funds to areas that most needed assistance.

Examples


There is opposition among many voters to


✘ nuclear power plants based on a belief in their threat to human health.

Many voters oppose nuclear power plants

✔ because they believe such plants threaten human health.

Examples

The outsourcing of high-tech work to Asia by  corporations means the loss of jobs for many American workers.

 Many American workers are losing their job because corporations are outsourcing their high-tech job to Asia

Removed Nominalization Makes Sentences Crisper

A revision **of** the program will result **in** increases

x **in** our efficiency **in** the servicing **of** clients

If we revise the program, we can serve clients

✓ more efficiently

A Well Defined Character Increases the Amount of Information

- ✘ There was an affirmative decision for expansion
- ✓ The Director decided to expand the program
- ✘ Simulations have been performed...
- ✓ We performed simulations...

Use humans as characters when possible

Active vs. Passive Voice

- ❑ Always use the active voice unless it makes sense to use the passive voice

Active voice



I lost my phone

Passive voice

My phone was lost [by me]


- ❑ The passive voice switches the character (I) and the object (my phone) around the verb
 - There are three good reasons to use this feature


When to Use the Passive Voice?

- When the character of the action does not need to be named
 - Because we don't know this character or because it is evident
 -  • The voters reelected the president with 52% of the votes
 -  • The president was reelected with 52% of the votes

When to Use the Passive Voice?

- To improve the glue between sentences
 - That will be discussed later in details

 “We must decide whether to improve education in the sciences alone or to raise the level of education across the whole curriculum. The weight given to industrial competitiveness as opposed to the value we attach to the liberal arts will determine our decision.”

 “We must decide whether to improve education in the sciences alone or to raise the level of education across the whole curriculum. Our decision will be determined by the weight given to industrial competitiveness as opposed to the value we attach to the liberal arts.”

When to Use the Passive Voice?

- To have a consistent point of view

- Point of view of the Allies

“By early 1945, the Allies had essentially defeated Germany.

✓ American, French, [...] had breached its borders and were bombing around the clock. But they had not yet so devastated Germany as to destroy its ability to resist.”

- Point of view of the Germans

“By early 1945, Germany had essentially been defeated by allies.

✓ Its borders had been breached by American, French [...], and it was being bombed around the clock. It had not been so devastated, however, that it could not resist.”

Can I use “I” or “we” as the subject?

- Yes, you must do it
 - Be aware that some editors or community (for dubious reasons) prohibit this use
 - In that case, follow your community or editor: you write for the readers, not for you. Do what they are used to read
- Use “I” when your role must be identified
 - Master, Ph.D. thesis
- Use “we” otherwise
 - “we” stands for “the authors”

Can I use “I” or “we” as the subject?

- ✗ Experiments have been performed using a dedicated appliance...
- ✗ It has been shown that the function convergences...
 - Who experimented? Who showed the convergence? These are critical questions to answer
- ✓ I made experiments using a dedicated appliance...
- ✓ Doe et al. made experiments using a dedicated...
- ✓ We show that the function convergences...
- ✓ Smith et al. show that the function convergences...

Unpack Compound Nouns

- They are hard to read and lead to ambiguity

✘ The **plant safety standard committee** discussed...

✓ The committee discussed the standard for plant safety...

✓ The committee on standards for plant safety discussed...

Unpack Compound Nouns

- Always unpack more than 2 compound nouns unless it is a well known technical term of your community (that is for your reader)

“Computer science” instead of “science for computers”

“receiver-driven multicast layered congestion control protocol” instead of “a protocol for the control of congestion using layers in multicast networks that is driven by receivers”


Concision


- Get right to the point
 - Avoid meta-discourse, redundancy, and obvious statements

It is almost certainly the case that totalitarian systems cannot

 allow a society to have what we would define as stable social relationships

 Totalitarianism prevents stable social relationships

 Do not try to predict future events that will completely revolutionize society

 Do not try to predict revolutionary events

Writing Style

- Sentences
- Glue between sentences (that is, the flow of idea) to form a paragraph
- Complex sentences

Cohesion among sentences

From familiar to new

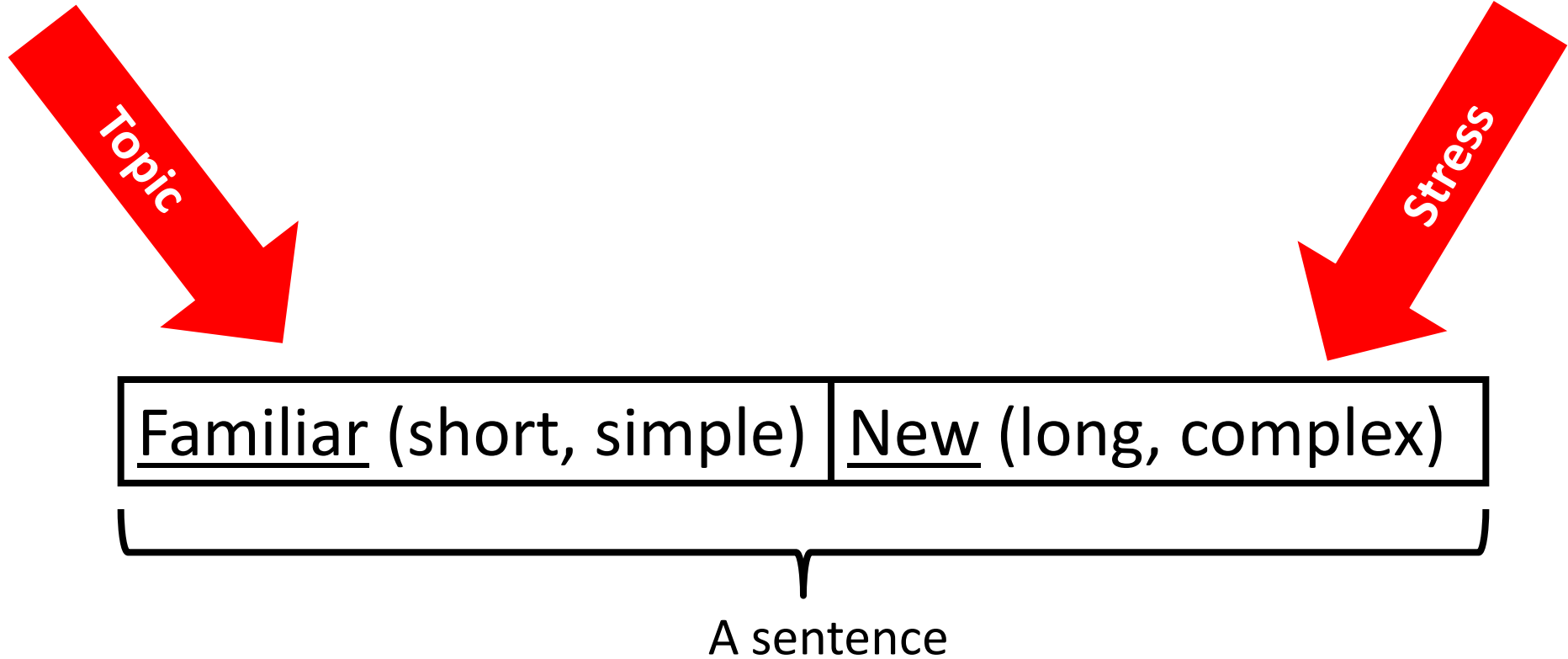
Consistency of subjects

Create a Natural Flow Among Sentences

Some astonishing questions about the nature of the universe have been raised by scientists studying black holes in space. The collapse of a dead star into a point no larger than a marble creates a black hole. So much matter compressed into so little volume changes the fabric of space around it in puzzling ways.

Some astonishing questions about the nature of the universe have been raised by scientists studying black holes in space. A black hole is created by the collapse of a dead star into a point no larger than a marble. So much matter compressed into so little volume changes the fabric of space around it in puzzling ways.

How a Reader Processes a Sentence?



Familiar

- Already introduced in the previous sentence (used to create a flow)

“...by scientists studying black holes in space. A black hole is created...”

- A general knowledge or not surprising information for the reader

“... So much matter compressed into so little volume changes the fabric of space around it in puzzling ways. Astronomers have reported that...”


- Should be short and simple
 - Ideally, a character close to its action


Familiar and Topic Position

- The topic position is defined by the character and its action
 - It gives a theme/topic to the sentence

New

- New information to the readers that they cannot anticipate
- As a general rule, move complex and technical terms at the end of sentences

 A sociometric and actuarial analysis of Social Security revenues and disbursements for the last six decades to determine changes in projecting deficits is the subject of this study.

 In this study, we analyze Social Security revenues and disbursements for the last six decades, using sociometric and actuarial criteria to determine changes in projecting deficits.

New and Stress Position

- The stress position is at the end of the sentence
 - Users will implicitly get that the last few words have a higher importance
- The stress position is not the entire new part of the sentence, it is only the last few words

Compare the stress:

History of the Decline and Fall of the Roman Empire

History of the Roman Empire's Decline and Fall

Familiar and New



Topic

“A black hole is created by the collapse of a dead star into a point no larger than a marble.”




Stress


Use the active and passive voice to respect this rule

Is It Possible to Always Imbricate Sentences?

- We cannot always repeat at the beginning of a new sentence the stress of the previous one
 - In some cases, it does not make any sense
- But, in all cases
 - **Keep the topic of each sentence short and familiar**
 - The character close to its action
 - **Keep the topics reasonably consistent in a paragraph**
 - The first sentence gives the main topic (theme, character) of the paragraph, that is **the topic sentence**

How to Revise a Paragraph?

 Competition by Asian companies with American companies in the Pacific is the first phase of this study. Labor costs and the ability to introduce new products quickly in particular are examined. A plan that will show American industry how to restructure its facilities will be developed from this study.

 In the first phase of this study, we examine how Asian companies compete with American ones in the Pacific region. We examine in particular their labor costs and ability to introduce new products quickly. From this study, we develop a plan that will show American industry how to restructure its facilities.

Vegetation covers the earth, except for those areas continuously covered with ice or utterly scorched by continual heat.

✘ Richly fertilized plains and river valleys are places where plants grow most richly, but also at the edge of perpetual snow in high mountains. The ocean and around its edges as well as in and around lakes are densely vegetated. The cracks in busy sidewalks have plants in them. Before humans existed, the earth was covered with vegetation and the earth will have vegetation long after evolutionary history swallows us up.

✔ Vegetation covers the earth, except for those areas continuously covered with ice or utterly scorched by continual heat. Indeed, plants grow in richly fertilized plains and river valleys, but also at the edge of perpetual snow in high mountains. Dense vegetation grows in the ocean and around its edges as well as in and around lakes. Plants grow in the cracks in busy sidewalks. Vegetation covered the earth before humans existed and will cover it long after evolutionary history swallows us up.

Consistency of the Topic

- You might have heard that varying the wording of a topic is a good stylistic practice
 - This is plain wrong
- Always use the exact same wording for the same topic, but you can vary what is around it

xx A powerful computer is... A high resource machine has... capable appliance... In summary, a high profile desktop

x A powerful desktop is ... A powerful desktop has... a powerful desktop... In summary, a powerful desktop ...

✓ A powerful desktop is... Such a desktop has... this desktop... In summary, a powerful desktop

Consistency of the Topic

- In a single paragraph, limit the number of topics/characters (identified by the topic position of each sentences) to 1 or 2
- Use the topic sentence of the paragraph (first sentence) to introduce these topics/characters, or the theme of the paragraph

The paragraph is the unit of composition

Use Parallelism

- Elegant and powerful device to express parallel idea

✓ Hackers can compromise machines for **three** reasons. **First**, the operating system... **Second**, the network ... **Third** (or Last), the physical...

✓ We present **four** main contributions in this paper. **(i)** We show that... **(ii)** We design a ... **(iii)** We measure... **(iv)** We show...

✓ On the one hand, the equilibrium is...On the other hand, the equilibrium is

Use Parallelism

- Do not overuse
 - One or two such structure per page
 - Coordination might be more elegant (to be discussed)

Writing Style

- Sentences
- Glue between sentences (that is, the flow of idea) to form a paragraph
- **Complex sentences**

“How you begin a sentence
determines its clarity;
how you end it determines
its rhythm and grace”


— J. M. Williams


The Beginning of a Sentence

- In the first few words
 - Define the topic of the sentence
 - Using a well defined and short subject (e.g., a character)
 - A verb defining an action
 - And an object
- You must not have more than a few words between the subject and the verb, and between the verb and the object
 - Otherwise, revise


The End of a Sentence


- Put toward the end long clauses and complex structures
 - Use the stress position for the last few words

 A new sales initiative that has created a close integration between the garden and home products departments has made significant improvements to the services that Acme offers.

 Acme has significantly improved its services with a new sales initiative that closely integrates the departments for garden and home products.

Put Long Openings at the End


 Since most undergraduate students change their fields of study at least once during college careers, many more than once, first-year students who are not certain about their program of studies should not load up their schedules to meet requirements for a particular program


 First-year students should not load up their schedules with requirements for a particular program, because most of them change their fields of study at least once during their college careers.


Exception


- The opening might be fine if it is used as a transition with the previous sentence
 - E.g., if-clause, when-clause, because-clause, since-clause, although-clause, etc. referring to the previous sentence


✓ If we are to limit this spread of nuclear weapons, we must guarantee the security of nations wanting to arm themselves against their neighbors.


 A company that focuses on hiring the best personnel and then trains them not just for the work they are hired to do but for higher-level jobs is likely to earn loyalty of its employees.


 When a company focuses on hiring the best personnel and then trains them not just for the work they are hired to do but for higher-level jobs, it is likely to earn loyalty of its employees.


 A company is likely to earn loyalty of its employees when it focuses on hiring the best personnel and then trains them not just for the work they are hired to do but for higher-level jobs.


 Some companies focus on hiring the best personnel and then trains them not just for the work they are hired to do but for higher-level jobs. Such companies are likely to earn loyalty of their employees.


 Some scientists, because they write in a style that is impersonal and objective, do not easily communicate with the public.

 Because some scientists write in a style that is impersonal and objective, they do not easily communicate with the public. This lack of communication damages...

 Some scientists do not easily communicate with the public, because they write in a style that is impersonal and objective. However, a poor style can be improved...

 We must develop, if we are to become competitive with other companies in our region, a core of knowledge regarding the state of the art in effective industrial organizations.

 If we are to become competitive with other companies in our region, we must develop a core of knowledge regarding the state of the art in effective industrial organizations.

 We must develop a core of knowledge regarding the state of the art in effective industrial organizations, if we are to become competitive with other companies in our region.

How to Fix Complex Sentences?

- They are three main techniques
 - Cut useless relative pronouns (who, which, that, etc.) and split into independent sentences
 - Easy
 - Use modifiers (resumptive, summative, free)
 - Elegant and easy
 - Use coordination
 - Elegant and very powerful

Beware of monotony

Cut and Split

Of the many areas of science important to our future, few are more promising than genetic engineering, **which** is a new way of manipulating the elemental structural units of life itself, **which** are the genes and chromosomes **that** tell our cells how to reproduce to become the parts **that** constitute our bodies.

Of the many areas of science important to our future, few are more promising than genetic engineering,

which is a new way of manipulating the elemental structural units of life itself,

which are the genes and chromosomes

that tell our cells how to reproduce to become the parts

that constitute our bodies.

✘ Of the many areas of science important to our future, few are more promising than genetic engineering, **which** is a new way of manipulating the elemental structural units of life itself, **which** are the genes and chromosomes **that** tell our cells how to reproduce to become the parts **that** constitute our bodies.

✔ Of the many areas of science important to our future, few are more promising than genetic engineering, a new way of manipulating the elemental structural units of life itself, the genes and chromosomes that tell our cells how to reproduce to become the parts that constitute our bodies.

✔✔ Many areas of science are important to our future, but few are more promising than genetic engineering. It is a new way of manipulating the elemental structural units of life itself, the genes and chromosomes that tell our cells how to reproduce to become the parts constituting our bodies.

Resumptive Modifier


- Find the key noun, adjective, or verb and repeat it, after a coma ending a grammatically complete sentence


Resumptive Modifier


✓ When we discovered the earth was not the center of the universe, it changed our understanding of who we are. Our understanding changed again by Darwin, again by Freud, and again by Einstein

✓ When we discovered the earth was not the center of the universe, it changed our understanding of who we are, which changed again by Darwin, again by Freud, and again by Einstein.

✓ When we discovered the earth was not the center of the universe, it changed our understanding of who we are, an understanding changed again by Darwin, again by Freud, and again by Einstein.


 It was American writers who found a voice that was true to the rhythms of the working man's speech and lyrical in its celebration of his labor.

 It was American writers who found a voice that was both true and lyrical, true to the rhythms of the working man's speech and lyrical in its celebration of his labor.


 All who value independence should resist the trivialization of government regulation, resist its obsession with administrative tidiness and compulsion to arrange things not for our convenience but for theirs.

Summative Modifier

- Add a summary with a key term of the previous sentence, after a coma ending a grammatically complete sentence


 Economic changes have reduced Russian population growth to less than zero. These changes will have serious social implications.


 Economic changes have reduced Russian population growth to less than zero, which will have serious social implications.

 Economic changes have reduced Russian population growth to less than zero, a demographic event that will have serious social implications.

Free Modifier


- Comment on the previous sentence, after a coma ending a grammatically complete sentence
 - Usually, the modifier is a verb in “ing” form


 Global warming will become a central political issue of the twenty-first century. It will raise questions whose answers will affect the standard of living in every Western nation.

 Global warming will become a central political issue of the twenty-first century, raising questions whose answers will affect the standard of living in every Western nation.




Coordination

- Coordinate elements that are parallel both in **grammar** and in **sense**
 - And, or, not, but, yet
- Balance and symmetry are important for the elegance
 - Each coordinated fragment echoing the other one
- When balance is not possible
 - Always coordinate from the short/simple fragment to the long/complex one

Besides the fact that no civilization has experienced such a rapid
 alterations in their spiritual and mental lives, the material conditions of their daily existence have changed greatly too.

 No civilization has experienced such rapid alterations **in** their spiritual and mental lives, and **in** the material conditions of daily existence.

Beware of Faulty Grammatical Coordination

-  The committee recommends revising the curriculum to recognize trends in local employment and that the division be reorganized to reflect the new curriculum
-  The committee recommends that the curriculum be revised to recognize trends in local employment and that the division be reorganized to reflect the new curriculum
-  The committee recommends revising the curriculum to recognize trends in local employment and reorganizing the division to reflect the new curriculum

Exceptions to Grammatical Parallelism


- Noun phrase coordinated with a how-clause


✓ We will discuss **the problems** of education in developing nations and **how coordinated efforts can address** them in economical ways.

- Coordinate an adverb with a prepositional phrase


✓ The proposal appears to have been written **quickly, carefully,** and **with the appropriate** focus.


From Short to Long

 We should devote a few final words to a matter that reaches beyond the techniques of research to the connections between those subjective values that reflect our deepest ethical choice and objective researches.

 We should devote a few final words to a matter that reaches beyond the techniques of research to the connections between objective researches and those subjective values that reflect our deepest ethical choice.

From Short to Long

 We should devote a few final words to a matter that reaches beyond the techniques of research to the connections between those subjective values that reflect our deepest ethical choice and strongest intellectual commitments, and objective researches.

 We should devote a few final words to a matter that reaches beyond the techniques of research to the connections between objective researches, and those subjective values that reflect our deepest ethical choice and strongest intellectual commitments.

Emphasizing Coordination

- Both X and Y
- Not only X but Y
- (n)either X (n)or Y


✓ Great Britain is a good trading partner and a reliable ally in the war against terrorism

✓ Great Britain is both a good trading partner and a reliable ally in the war against terrorism


Emphasizing Coordination

- Respect the grammatical coordination
 - Coordinate verbs, nouns, etc. but do not mix

When you punctuate carefully, you not only help readers

 understand a complex sentence more easily, but you enhance your own image as a good writer

When you punctuate carefully, you not only help readers

 understand a complex sentence more easily, but enhance your own image as a good writer

Balance and Symmetry

- Balance and symmetry
 - Sound, rhythm, structure, meaning
- Balanced coordination
 - And, or, not, but, yet
- Uncoordinated balance

No magic, but reading and practice

Balanced Coordination

The national unity of a free people depends upon a sufficiently even balance of political power to make it impractical for the administration to be arbitrary and for the opposition to be revolutionary and irreconcilable. Where that balance no longer exists, democracy perishes. For unless all the citizens of a state are forced by circumstances to compromise, unless they feel that they can affect policy but that no one can wholly dominate it, unless by habit and necessity they have to give and take, freedom cannot be maintained.

— Walter Lippmann

Balanced Coordination

The national unity of a free people depends upon a sufficiently even balance of political power to make it impractical for **the administration** to be *arbitrary* and for **the opposition** to be *revolutionary and irreconcilable*. Where that balance no longer exists, democracy perishes. For unless all the citizens of a state are forced by circumstances to compromise, unless they feel that they can affect policy but that no one can wholly dominate it, unless by habit and necessity they have to give and take, freedom cannot be maintained.

{ for **the administration** to be *arbitrary*
and
for **the opposition** to be { *revolutionary*
and
irreconcilable. } } — Walter Lippmann

Balanced Coordination

The national unity of a free people depends upon a sufficiently even balance of political power to make it impractical for the administration to be arbitrary and for the opposition to be revolutionary and irreconcilable. **Where that balance *no longer exists, democracy perishes.*** For unless all the citizens of a state are forced by circumstances to compromise, unless they feel that they can affect policy but that no one can wholly dominate it, unless by habit and necessity they have to give and take, freedom cannot be maintained.

— Walter Lippmann

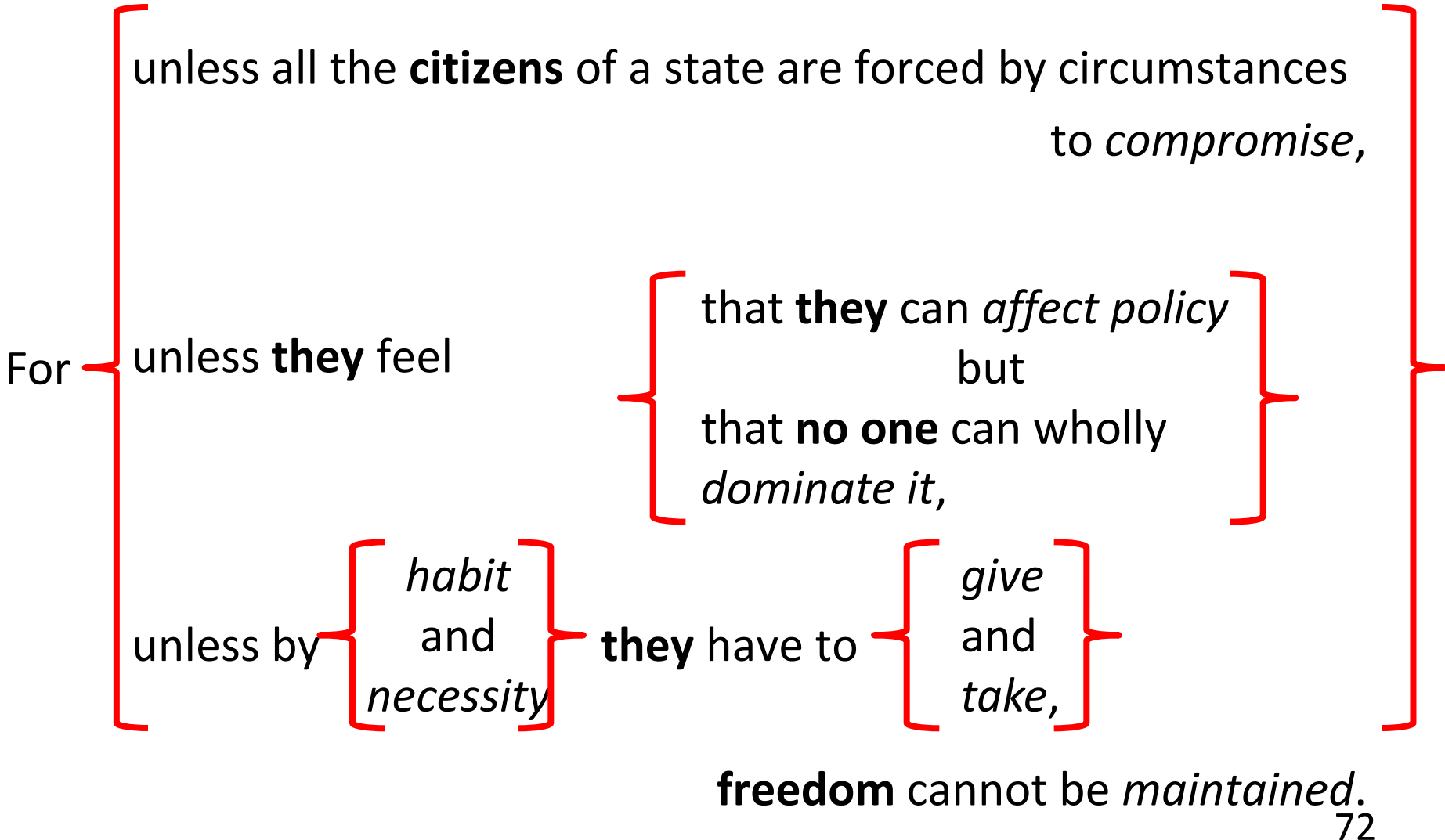
Where **(that balance *no longer exists,*
democracy perishes.)**

Balanced Coordination

The national unity of a free people depends upon a sufficiently even balance of political power to make it impractical for the administration to be arbitrary and for the opposition to be revolutionary and irreconcilable. Where that balance no longer exists, democracy perishes. For **unless** all the **citizens** of a state are forced by circumstances *to compromise*, **unless they** feel that **they** can *affect policy* but that **no one** can *wholly dominate it*, **unless** by *habit and necessity* **they** have to *give and take*, **freedom** cannot be *maintained*.

— Walter Lippmann

Balanced Coordination



Uncoordinated Balance

- Balance with clauses not grammatically coordinated

Scientists whose research created revolutionary views of the universe invariably confuse those of us who construct reality from our common-sense experience of it.

Scientists whose research *created revolutionary views of the universe*
invariably confuse
those of us who *construct reality from our common-sense experience of it.*

Those of us concerned with our school systems will not sacrifice the intellectual growth of our innocent children to the social engineering of incompetent bureaucrats.

Those of us concerned with our school systems will not sacrifice

the **intellectual growth** of

our innocent children

to

the **social engineering** of

incompetent bureaucrats.

Were I trading scholarly principles for financial security, I would not be writing short books on minor subjects for small audiences.


Were I trading (scholarly principles
for
financial security,)

I would not be writing (short books
on
minor subjects
for
small audiences.)

Elegant and Efficient Emphasis

- Use a strong word at the stress position, or better, a pair of them
 - From weakest to strongest
 - Preposition, adjectives and adverbs, nouns, nominalization

 Reducing the number of working hours is a project that no board member is willing to give support to.

 Reducing the number of working hours is a project that no board member is willing to support.

Two Devices for Emphasis

- Of + strong word
- Suspension

Of + strong word

In the second century AD, the Roman Empire comprehended the earth's fairest, most civilized part. Ancient renown and disciplined valour guarded its extensive frontiers. The gentle but powerful influence of laws and manners had gradually unified the provinces. Their peaceful inhabitants enjoyed and abused luxurious wealth while decently preserving what seemed to be a free constitution. Appearing to possess the sovereign authority, the Roman senate devolved on the emperors all executive governmental powers.

—Joseph M. Williams

Of + strong word

In the second century of the Christian era, the Empire of Rome comprehended the fairest part of the earth, and the most civilized portion of mankind. The frontiers of that extensive monarchy were guarded by ancient renown and disciplined valour. The gentle but powerful influence of laws and manners ✓ had gradually cemented the union of the provinces. Their peaceful inhabitants enjoyed and abused the advantages of wealth and luxury. The image of a free constitution was preserved with decent reverence: the Roman senate appeared to possess the sovereign authority, and devolved on the emperors all the executive powers of government.

— Edward Gibbon's. History of the Decline and Fall of the Roman Empire

Suspension

- Delay the point of your sentence to the end to create a feel of suspense and a sense of climax
 - This works against clarity, so use it with care

If [journalists] held themselves as responsible for the rise of public cynicism as they hold “venal” politicians and the “selfish” public: if they considered that the license they have to criticize and defame comes with an implied responsibility to serve the public—if they did all or any of these things, they would make journalism more useful, public life stronger, and themselves far more worthy of esteem.

—James Fallows. *Breaking the News*

Notion of Rhythm

- Short sentences in literature give a feel of
 - Urgency, terse certainty, passion, etc.
- Long sentences in literature give a feel of
 - Confusion, being in the head of the writer/character, etc.
- It is all about feeling, which can be inappropriate in the context of scientific writing
 - Using coordinated and balanced sentences will give a feel of elegance, but do not abuse

Write text where the
reader expects it to be

In a sentence subjects are
characters and verbs are
actions

Characters are close to verbs

Cohesion among sentences

From familiar to new

Consistency of subjects

“How you begin a sentence
determines its clarity;
how you end it determines
its rhythm and grace”

— J. M. Williams

An elegant style comes from
the appropriate use of
writing devices

Do not overuse one unless you want
to give an on purpose peculiar feel

Part 2

Writing a Story

“Looking back, I think it was more difficult to see what the problems were than to solve them”

—Charles Darwin

What is the problem?

From general to specific

Scope and impact

What is your solution?

Your contributions

So what?

Insight and impact

Part 3

Frequent mistakes

Comma

- With three or more coordinated terms, use a comma after each one except the last
Apples, bananas, and oranges are fruits.
I like white, blue, or red cars.
- Always a comma before and after *i.e.* and *e.g.*
Mobile devices, *i.e.*, smartphones and tablets, changed the way we communicate.
Mobile devices, *e.g.*, smartphones, changed the way we communicate.

Which vs. That

- Nonrestrictive clauses are parenthetic
 - Do not define or limit, merely add something
 - Must be surrounded by commas

In 2000, when you graduated, I decided to buy a new car

- Restrictive clauses are mandatory to the understanding
 - No comma surrounding the clause

People who eat too much sugar have a higher probability to suffer from diabetes

Which vs. That

- *Which* introduces nonrestrictive clauses

You will find the car, which is red, in the garage

- *That* introduces restrictive clauses

You will find the car that is red in the garage

This is Often Ambiguous

A small fraction of the Internet traffic is encrypted, therefore, with physical access to network wires, anybody can infringe the privacy of Internet users. This is a problem that can only be addressed by both politics and engineers.

- *This* refers to what
 - Lack of encryption, physical access to wires, or both?

A small fraction of the Internet traffic is encrypted, therefore, with physical access to network wires, anybody can infringe the privacy of Internet users. This small fraction of encryption can only be addressed by both politics and engineers.

Incorrect Use of *While*

- *While* is not equivalent to *and*, *but*, *although*, or *whereas*
 - *While* means *at the same time*

✘ While I often swim in a swimming pool, I don't swim in the sea

✓ Whereas I often swim in a swimming pool, I don't swim in the sea

✓ I swim in a swimming pool but not in the sea

✓ While I was running, I hurt my back

Always Reference Figures and Tables in the Text

- A figure or a table that is not referenced and discussed in the text must be removed

We see in Figure 3 that...

We compare in Table 4 the two strategies...

Captions for Figures and Tables

- Captions must contain everything a reader needs to understand a figure or a table without reading the text
- Each caption must contain
 - A self-explanatory title
 - An explanation on how to read the figure or table (explain everything that is not obvious: symbols, legend...)
 - The main insight

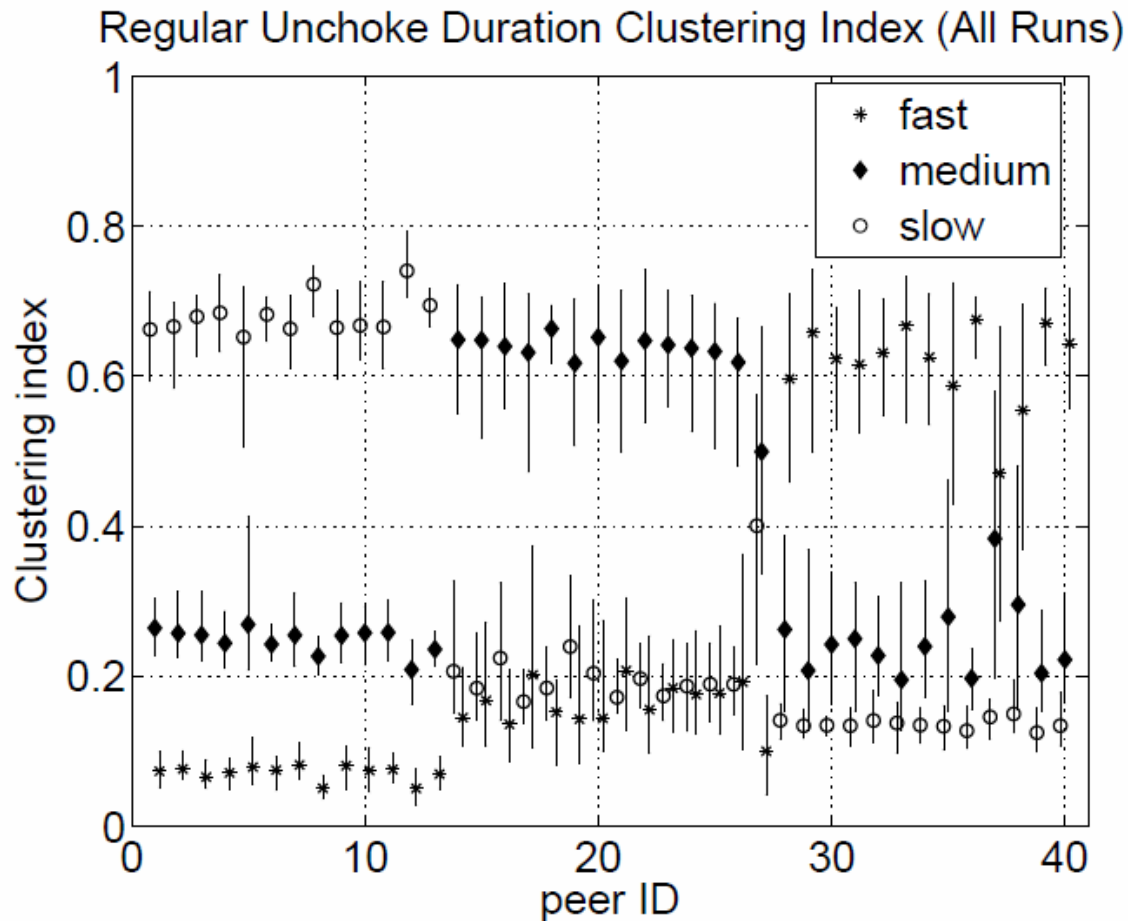


Figure 2: Clustering index for all peers, averaged over all runs, in the presence of a well-provisioned seed. Errorbars represent the 10th and 90th percentiles. Peers 1 to 13 have a 20 kB/s upload limit, peers 14 to 27 have a 50 kB/s upload limit, and peers 28 to 40 have a 200 kB/s upload limit. The seed (peer 41) is limited to 200 kB/s. Peers show a strong preference to unchoke others in the same class.

Service	YouTube			Netflix
Container	Flash	HTML5	Flash HD	Silverlight
Internet Explorer	Short	Short	No	Short
Mozilla Firefox	Short	No	No	Short
Google Chrome	Short	Long	No	Short
iOS (native)	Not Applicable	Multiple	Not Applicable	Short
Android (native)		Long		Long

Table 1: Streaming Strategies. *Short, Long, and No respectively stand for the strategies of short ON-OFF cycles, long ON-OFF cycles, and no ON-OFF cycles. Streaming strategy depends on the combination of browser and container.*

Citations Are Not Part of the Text

- ✘ In [1], the authors show that...
 - Grammatically incorrect
 - Do not give credit to the authors
- ✔ Doe et al. [1] show that...

Use a Spell Checker

- Never give a document to read before running a spell checker on it

How to Submit a Paper?

- Always put on the first page
 - Name, email, affiliation of all authors
 - Unless double blinded submission
- Always send a PDF
 - No Word, OpenOffice, plain text, etc.
- Conform to page limit
 - 2 pages is 2 pages, not 2 pages plus a third one with two lines

How to Submit a Paper?

- For a scientific papers Latex is mandatory
 - Best presentation
 - Looks most professional
 - Do not try to cheat, any reviewer can identify a non-Latex document

Plagiarism

- **Reusing text** (even a single sentence) from someone else (journal, conference, on-line, etc.) without proper credit **is strictly forbidden**
 - This is a severe transgression
- Reusing text with proper credit (apart from a few words or a single sentence) is not professional
 - Rephrase **and** give proper credit
- Self plagiarism is from “not recommended” to “strictly forbidden”

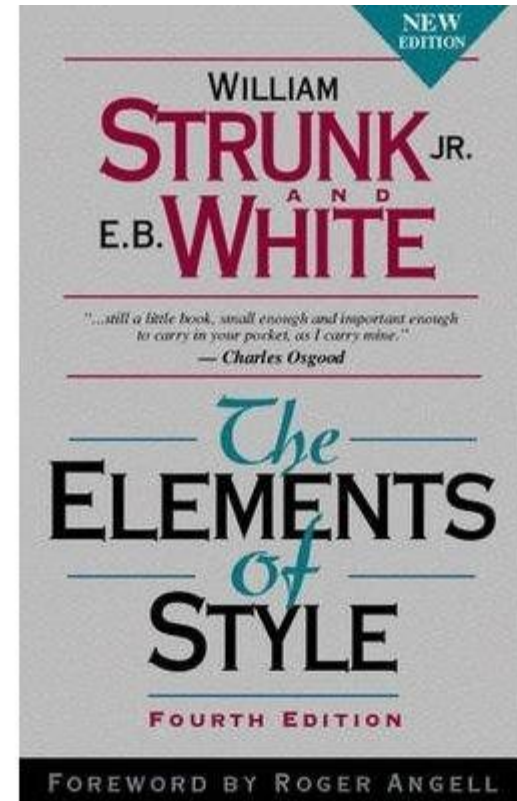
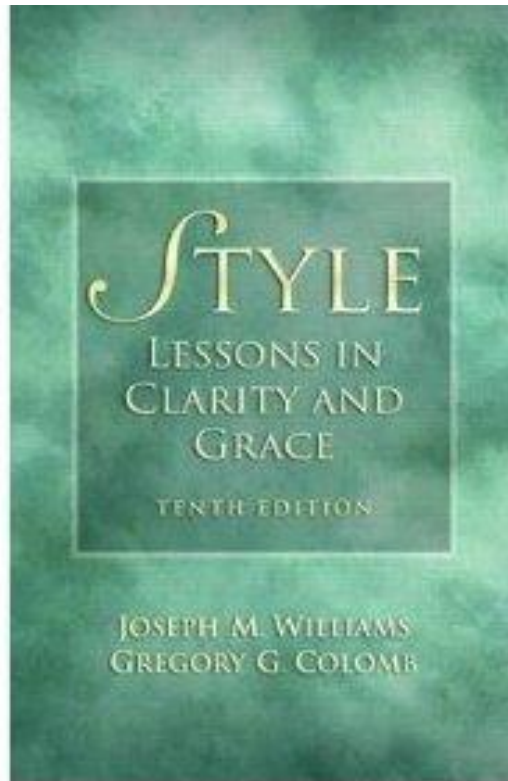
Thank you!

The Art and Science of Writing

Arnaud Legout

arnaud.legout@inria.fr

References



Online at:

<http://www.bartleby.com/141/>

References

[The Science of Scientific Writing,](#)

George D. Gopen and Judith A. Swan,

American Scientist (Nov-Dec 1990), Volume 78,
550-558.