

Technical Writing and Speaking in English

Class 4: Connecting your ideas.¹

Enikő Kevi

¹Université Grenoble Alpes, Grenoble INP, Inria, LIG, France
email:kevi.eniko@gmail.com

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¹This course is based on the book The Craft of Scientific Writing, Michael Alley.

Goal of the lecture

From proper **sentences to** well organized **paragraphs**.

Learning to convey a group of **linked ideas**.



Case study



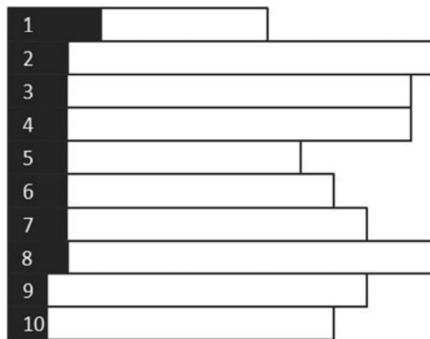
Mount St. Helens erupted on May 18, 1980. A cloud of hot rock and gas surged northward from its collapsing slope. The cloud devastated more than 500 square kilometers of forests and lakes. The effects of Mount St. Helens were well documented with geophysical instruments. The origin of the eruption is not well understood. Volcanic explosions are driven by a rapid expansion of steam. Some scientists believe the steam comes from the water originally dissolved in the magma. Scientists have to understand the source of steam in volcanic eruptions. Scientists have to determine how much water the magma contains.

What makes readers bored?

- **disconnected** ideas in the neighboring sentences
- lack of variety in sentence **structure**
- lack of variety in sentence **length**

Analysis of the volcano paragraph

- each sentence starts with the subject noun
- each sentence has around 8-13 words
- lack of variety results in monotone rhythm



Key aspects to connect ideas

- **sentence openers**
- sentence structures
- sentence lengths

Sentence openers

Basic ("default"):

- Subject noun
- Prepositional phrase
- Adverb
- Infinitive phrase
- Dependent clause

Sophisticated ("pleasant"):

- Participial phrase as modifier
- Gerundial phrase
- Dependent clause as subject
- Correlative conjunction
- Comparative correlative

Occasional ("wake-up call"):

- Question
- Appositive
- Adjective phrase
- Introductory series
- Direct object

Basic sentence openers

1) Subject noun

Examples:

- **Mount St. Helens** erupted on May 18, 1980.
- **Magma** intruded into the edifice of Mount St. Helens.

Basic sentence openers

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Details:

- provides the *what* or *who* detail
- ideal as the first sentence in a document or section
- direct way to move from idea A to idea B

Basic sentence openers

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- ideal as the first sentence in a document or section
- direct way to move from idea A to idea B

Warnings:

- used too often makes reading tiresome
- often fails to connect with the previous idea

2) Prepositional phrase

Examples:

- **Within minutes**, the mountain emitted a cloud of hot rock and gas.
- **On March 16, 1980**, the first sign of activity at Mount St. Helens occurred as a series of small earthquakes.
- **On the mountain's northern flank**, a bulge appeared.

Basic sentence openers

2) Prepositional phrase

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- focus on *when* and *where*
- often with prepositions *before*, *during*, *after* and *above*, *around*, *under*
- can help navigate through sections

Basic sentence openers

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Warnings:

- needs to be consistent in the text

3) Adverb

Examples:

- **Recently**, debate has arisen over the source of the steam.
- **Unexpectedly**, a magnitude 5.1 earthquake occurred.
- **Also**, the volcano's northern bulge and summit slid away as a huge landslide.

3) Adverb

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- **Recently**, debate has arisen over the source of the steam.
- **Unexpectedly**, a magnitude 5.1 earthquake occurred.
- **Also**, the volcano's northern bulge and summit slid away as a huge landslide.

Details:

- focus on the *how* or
- expresses the continuation of the previous sentence
- other examples are *moreover*, *therefore*

4) Infinitive phrase

Examples:

- **To measure the bulge**, we compared aerial photographs of the mountain from April 1980 with those back before the eruption activity.
- **To understand eruptions**, scientists have to understand how much water the magma contains.

4) Infinitive phrase

Examples:

- **To measure the bulge**, we compared aerial photographs of the mountain from April 1980 with those back before the eruption activity.
- **To understand eruptions**, scientists have to understand how much water the magma contains.

Details:

- answers the question *why*
- subtle way to incorporate *I* and *we* in the sentence

5) Dependent clause

Examples:

- **As the north side of the summit began to collapse**, a huge explosion occurred.
- **As the earthquake occurred**, the volcano's northern side and bulge slid away as a huge landslide - in fact, the largest recorded debris in history.

5) Dependent clause

Examples:

- **As the north side of the summit began to collapse**, a huge explosion occurred.
- **As the earthquake occurred**, the volcano's northern side and bulge slid away as a huge landslide - in fact, the largest recorded debris in history.

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- usually describes *when* and *why*
- we can describe more complex ideas

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Details:

- usually describes *when* and *why*
- we can describe more complex ideas

Warnings:

- long sentences, better to not use them too often
- order is important, easy to make the reader lost

Example of a bad dependent clause



Most dwellings in this region of Mauritania do not have access to electricity, so these homes have no steady light source at night unless they choose to burn a gas lamp or candle.



Because most dwellings in this region of Mauritania do not have access to electricity, these homes have no steady light source at night unless they choose to burn a gas lamp or candle.

Task: Write 4 sentences using the discussed sentence openers about:

Why many people love cats?

Reminder:

- ① *Subject noun:* "Magma intruded into the edifice of the mountain."
- ② *Prepositional phrase:* "Within minutes, the mountain emitted a..."
- ③ *Adverb:* "Unexpectedly, a magnitude 5.1 earthquake occurred."
- ④ *Infinitive phrase:* "To understand eruptions, scientists have to..."
- ⑤ *Dependent clause:* "After the earthquake occurred, the volcano..."

Sophisticated sentence openers

6) Participial phrase as modifier

Examples:

- **Its slope collapsing**, the mountain emitted a cloud of hot rock and gas.
- **Continually monitored since its observation**, the bulge on the mountain's north flank grew to about 140 meters.

Sophisticated sentence openers

6) Participial phrase as modifier

Examples:

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Details:

- formed by verbs with the *-ing* and *-ed* ending
- usually modifiers for nouns

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- usually modifiers for nouns

Warnings:

- misplaced modifiers - the subject noun is not what the opener modifies
- sentences may grow too long, making it difficult to understand

6) Participial phrase as modifier

Example for misplaced modifier:



Rising 24,000 meters into the atmosphere in only 15 minutes, scientists estimated the height of the ash cloud.



As estimated by the scientists, the height of the ask plume rose 24,000 meters into the atmosphere in only 15 minutes.

7) Gerundial phrase

Examples:

- **Calculating the amount of ash** required many assumptions.

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Details:

- participial phrases that act as a noun
- often you can create these openings by modifying *this* in the sentence

7) Gerundial phrase

Examples:

- **Calculating the amount of ash** required many assumptions.

Details:

- participial phrases that act as a noun
- often you can create these openings by modifying *this* in the sentence

This required many assumptions.

This calculation of the amount of ash required many assumptions.

Calculating the amount of ash required many assumptions.

8) Dependent clause as subject

Examples:

- **Why this earthquake triggered the eruption** remains a mystery.
- **What actually occurred** was a sudden blast that reduced the mountain's elevation by 400 meters.

8) Dependent clause as subject

Examples:

- **Why this earthquake triggered the eruption** remains a mystery.
- **What actually occurred** was a sudden blast that reduced the mountain's elevation by 400 meters.

Details:

- usually these dependent clauses begin with *what*, *when*, *where*, *how*, and *why*
- excellent choice for the last sentence of a paragraph
- gives emphasis on an important detail

9) Correlative conjunction

Examples:

- **Not only was the eruption the most deadly in U.S. history,** but it was also the most economically destructive.
- **Both the more than 10,000 earthquakes over the previous two months and** the 450-foot bulging of the mountain's north flank indicated that an eruption was imminent.
- **Not only did the eruption reduce St. Helens' height by 1300 feet, but** the eruption also left a crater 1 to 2 miles wide and 0.5 miles deep.

Sophisticated sentence openers

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Details:

- as an opener it tells the reader that there will be two subjects or independent clauses
- usually includes *not only ... but (also), both ... and, either ... or, neither ... nor*

10) Comparative correlative

Examples:

- **The greater the tumescence**, the more likely will be an eruption.
- **The higher the concentration of sulfur dioxide gas emissions**, the higher is the likelihood of an eruption.

10) Comparative correlative

Examples:

- **The greater the tumescence**, the more likely will be an eruption.
- **The higher the concentration of sulfur dioxide gas emissions**, the higher is the likelihood of an eruption.

Details:

- can be an ideal way to finish a paragraph, especially if the correlation is a major information in the text

Task: Write 4 sentences using the discussed sentence openers using at least 1 sophisticated opener about:

Birthdays without birthday cakes

Reminder:

- *Participial phrase as modifier:* "It's slope collapsing, the mountain..."
- *Gerundial phrase:* "Calculating the amount of ash required..."
- *Dependent clause as subject:* "Why this earthquake triggered..."
- *Correlative conjunction:* "Not only this eruption... but..."
- *Comparative correlative:* "The higher the... the higher the..."

11) Question

Examples:

- Is it groundwater heated by the magma or water originally dissolved in the magma itself?

11) Question

Examples:

- Is it groundwater heated by the magma or water originally dissolved in the magma itself?

Details:

- effective way to make a transition
- best used in the middle of a paragraph to orient the reader
- questions usually form a different perspective

Special occasion sentence openers

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Details:

- effective way to make a transition
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- questions usually form a different perspective

Warnings:

- in some cases questions might look childish or a cliché
- must be avoided at the end of a paragraph
- the answer to the question should be in the same paragraph to provide closure

12) Appositive

Examples:

- **The fifth highest peak in Washington before the eruption,** Mount St. Helens dropped 400 meters of elevation after the eruption occurred.
- **The costliest volcanic eruption in U.S. history,** the Mount St. Helens eruption led to the destruction of 250 homes, 47 bridges, and almost 300 km of highway.

12) Appositive

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- **The fifth highest peak in Washington before the eruption,** Mount St. Helens dropped 400 meters of elevation after the eruption occurred.
- **The costliest volcanic eruption in U.S. history,** the Mount St. Helens eruption led to the destruction of 250 homes, 47 bridges, and almost 300 km of highway.

Details:

- adds a second subject to the sentence that otherwise would be in a short separate sentence
- good way to significantly change the rhythm of the paragraph

13) Adjective phrase

Examples:

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Details:

- National Geographic style
- creates a dramatic sentence rhythm
- best used in the middle of the paragraph

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Details:

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- creates a dramatic sentence rhythm
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Warnings:

- the adjective phrase should remain short

14) Introductory series

Examples:

- **Ice, snow, water, and earth** - these materials formed the volcanic mudflows that slid for miles down the Toutle and Cowlitz Rivers.
- **A large scale flow of magma that stretched 600 square kilometers, the emission of 15 million tons of sulfur dioxide, and the largest debris avalanche in history** - these were but three of the effects of the eruption of Mount St. Helens.

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Details:

- introductory series followed by an *em-dash*
- good way to emphasise or do transition

Special occasion sentence openers

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Warnings:

- must be constructed with care to not make the reader lost

15) Direct object

Examples:

- **The tumescence** we measured with tiltmeters.
- ... required a measurement of the tumescence. **This** variable we measured using tiltmeters.

15) Direct object

Examples:

- **The tumescence** we measured with tiltmeters.
- ... required a measurement of the tumescence. **This** variable we measured using tiltmeters.

Details:

- keeps the emphasis on the work rather than on who did it

WE DID IT!!



Back to the case study



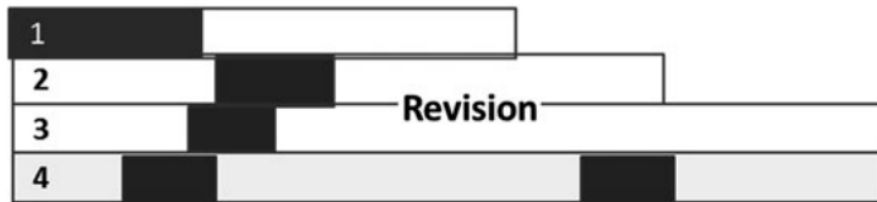
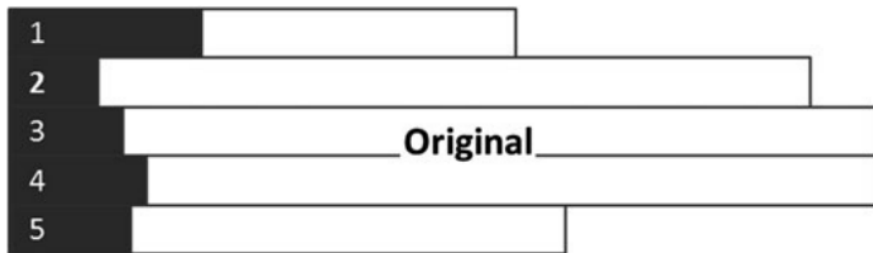
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Back to the case study



Mount St. Helens erupted on May 18, 1980. Its slope collapsing, the mountain emitted a cloud of hot rock and gas. Within minutes, the cloud devastated more than 500 square kilometers of forests and lakes. Although the effects of the eruption were well documented, the origin is not well understood. Volcanic explosions are driven by a rapid expansion of steam. Recently, debate has arisen over the source of the steam. Is it groundwater heated by the magma or water originally dissolved in the magma itself? To understand the source of steam in volcanic explosion, we have to determine how much water the magma contains.

Rhythm change after the revision



Take away message

**Varying sentence openers strengthens the links between the ideas
and sustains energy in the writing!**