The Challenge of Editing

Before we begin:
A fascinating grammar aside

adjectives in English absolutely have to be in this order: opinion-size-age-shape-colour-origin-material-purpose Noun. So you can have a lovely little old rectangular green French silver whittling knife. But if you mess with that word order in the slightest you'll sound like a maniac. It's an odd thing that every English speaker uses that list, but almost none of us could write it out. And as size comes before colour, green great dragons can't exist.

From: The Elements of Eloquence: Secrets of the Perfect Turn of Phrase

The Challenge of Editing, Take 2

"So-and-so is such a good writer"

No.

"So-and-so is such a good *editor*"

Ta-Nehisi Coates ✓
@tanehisicoates

Someday I'll post the first draft to the Case for Reparations or something. It always starts horrible.

Ta-Nehisi Coates ✓
@tanehisicoates

Four? First one was awful.

> **Will Hochman** @WillHochman
>
> @tanehisicoates How many drafts did you go through for Between the World and Me?

Why is editing hard?

Difficulties vary with different types of edits

- Editing your own work

- Working with others to edit your work

Why is editing your own work hard?

The secret to #editing your work is simple: you need to become its reader instead of its writer.
ANNA DEAVERE SMITH

#amwriting #writing

It is hard to sense a reader's confusion, when you know what you meant.

The best solution is often time. Always edit on a different day.

More tricks for editing your own work

Read it in a different way than you wrote it.

- On a printout
- In a different font (Comic sans. Not kidding.)
- Out loud
- Have someone (or Siri) read it to you
- In a location where you typically read

It is hard to undo work you struggled over.

The best solution is practice. The less "emotional overhead" you suffer when writing, the less overwhelming changes will be..

It is hard to face imperfections in your work.

However, you are a scientist.

Evaluating, correcting, and improving are *fundamental* to science.

Why is accepting editing from others hard?

We learn through trying, making mistakes, getting expert help, and then fixing the mistakes.

This experience can be emotionally complex for writing,
because writing merges "text" with "your ideas and thoughts"

We don't like to be criticized.

We *really* don't like to be criticized when we worked hard and struggled.

We *really, really* don't like to be criticized when the critique leads to more, emotionally-exhausting work.

But.

We learn through trying, making mistakes, getting expert help, and then fixing the mistakes.

If you cannot accept & learn from critique, you will not improve.

Remember: A heavy edit is filled with love.

"Look how invested my advisor is in my success!"

Active vs Passive voice
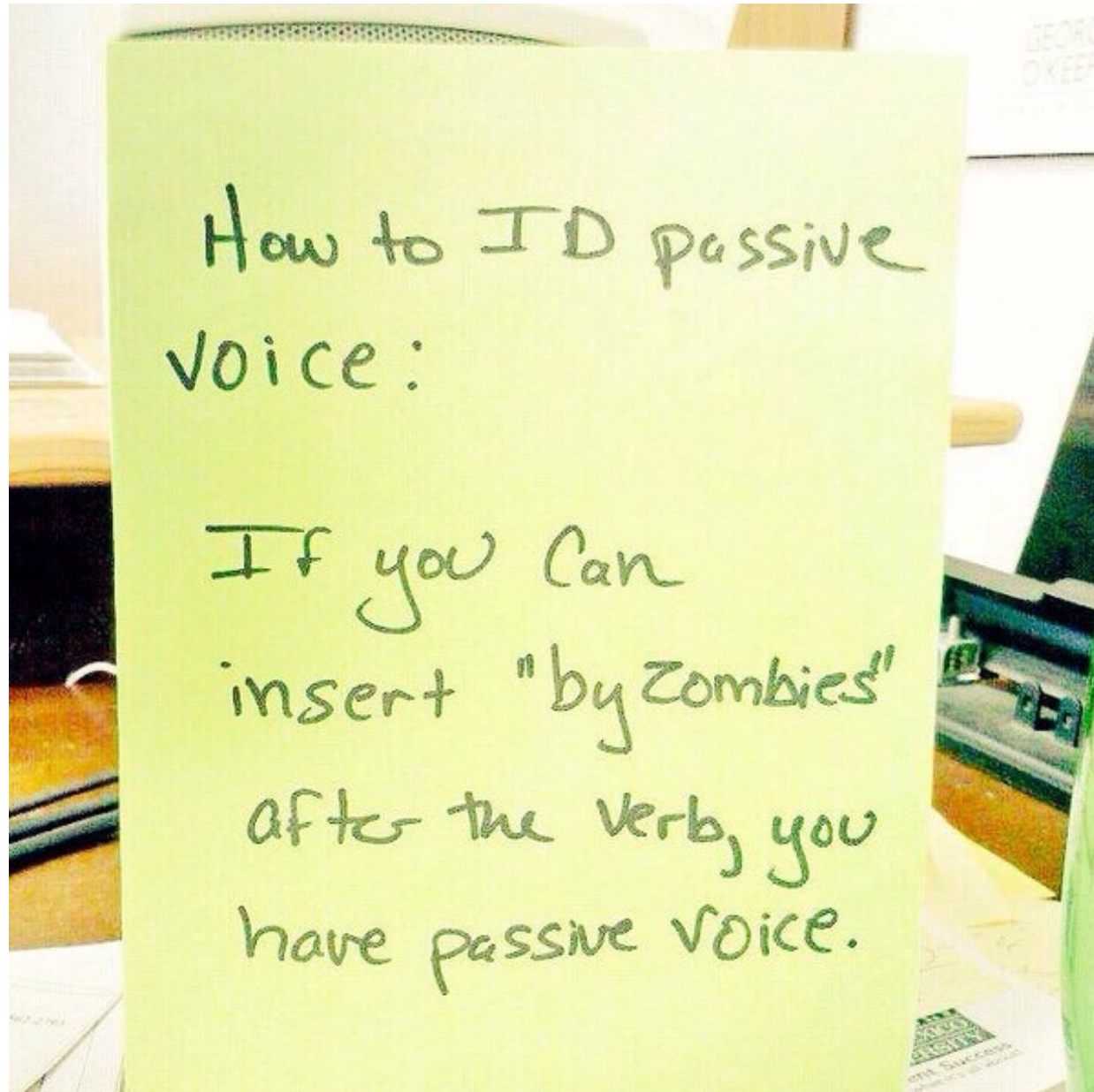
Active Voice

- Reduces ambiguity.

  Active: "*We reduced the ALMA data…*"

  Passive: "*The ALMA data was reduced…*", but by who? ALMA data center? The authors?

- Requires fewer words, producing shorter, clearer sentences.

Passive Voice

Passive voice is not intrinsically bad!

Can keep the true topic of the sentence in lead position.

"PNe can be identified by their strong OIII emission."

Passive, but stresses PNe

versus

"Strong OIII emission can indicate the presence of a PNe."

Active, but stresses OIII

Passive Voice

Passive voice is not intrinsically bad!

Can add variety, if used appropriately
(i.e., when not mixed with active in the same sentence).

Inappropriate mixing of active and passive voice

"We removed the large scale gradient using the illumination correction, then cosmic rays were identified."

Effective mixing of active and passive voice

"PNe can be identified by their strong OIII emission. We searched for this emission using narrow-band imaging."

"PNe can be identified by their strong OIII emission. We searched for this emission using narrow-band imaging."

The passive voice works here because the "missing actor" is truly generic.

"PNe can be identified by their strong OIII emission.This emission was searched for using narrow-band imaging."

The passive voice does *not* work here because the "missing actor" is a *specific* person/group — the authors.

"PNe can be identified by their strong OIII emission.This emission was searched for using narrow-band imaging."

Proposals and analysis sections should *always* favor active voice.

On to paragraphs

What is a paragraph?

Trivial definition:

More than one sentence.

What *is* a paragraph?

Better definition:

A single, rhetorical unit

What *is* a paragraph?

Every paragraph should have *exactly* one topic.

What *is* a paragraph?

That topic should be *distinct* from the topics of other paragraphs.

What *is* a paragraph?

Every paragraph should have a purpose*.

*i.e., a reason to exist

One topic per paragraph

The narrower the topic, the clearer the paragraph

A good paragraph

It is instructive to understand which aspects of the model are driving agreement with the data. The normalization of the model predictions depend on the evolution of ϕ^*, the redshift-dependent normalization of the stellar mass function, while the shapes depends on α^* and M^*, although the latter two dependencies are much weaker than the first. Recall that we have tuned the evolution of ϕ^* to reproduce the normalization of the SFR$-M_{\mathrm{star}}$ relations, but not the shape of these relations. The shape is thus a robust prediction of our approach, while the normalization agrees with the data by construction.

Conroy & Weschler 2009

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It has one clear topic, clearly stated up front

Conroy & Weschler 2009

Another good paragraph

The currently most productive set of indirect techniques for observing exoplanet atmospheres are those for systems where the planet transits and is eclipsed by its host star. These techniques do not require high spatial resolution, as the planet and star do not need to be spatially separated on the sky. Observations are made in the combined light of the planet and star (Figure 3-7) with the exoplanet spectrum separated out by comparison with observations of the star alone. As seen from a telescope, when the planet goes in front of the star, the starlight passes through the planet atmosphere and planet atmosphere spectral features are imprinted on the stellar spectrum. This is called transmission photometry or spectroscopy. When the planet goes behind the star, the planet disappears and reappears, adding either reflected light or thermal emission to the combined planet-star radiation. This is referred to as secondary eclipse photometry or spectroscopy.

Again, one clear topic, highlighted in first sentence

HDST Report

Both paragraphs lead with the main topic.

This is the same "reader signaling" that we discussed for choosing the beginning of a sentence.
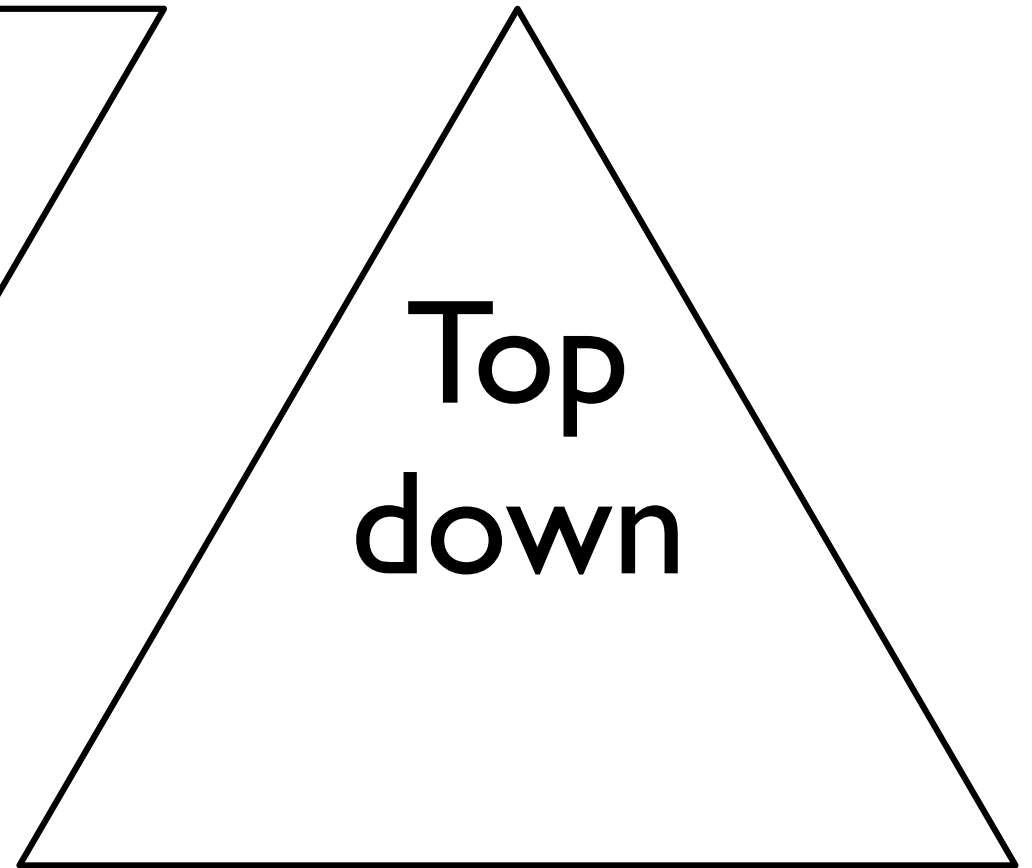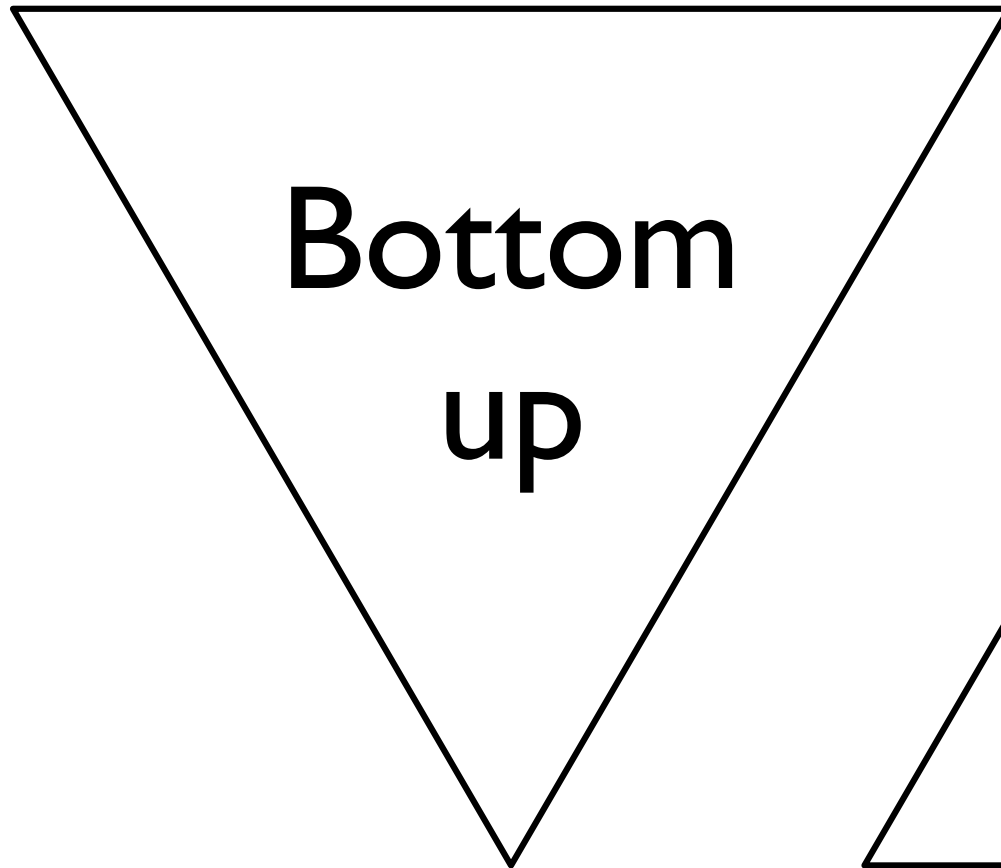
Both paragraphs lead with the main topic.
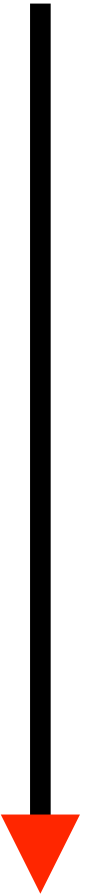
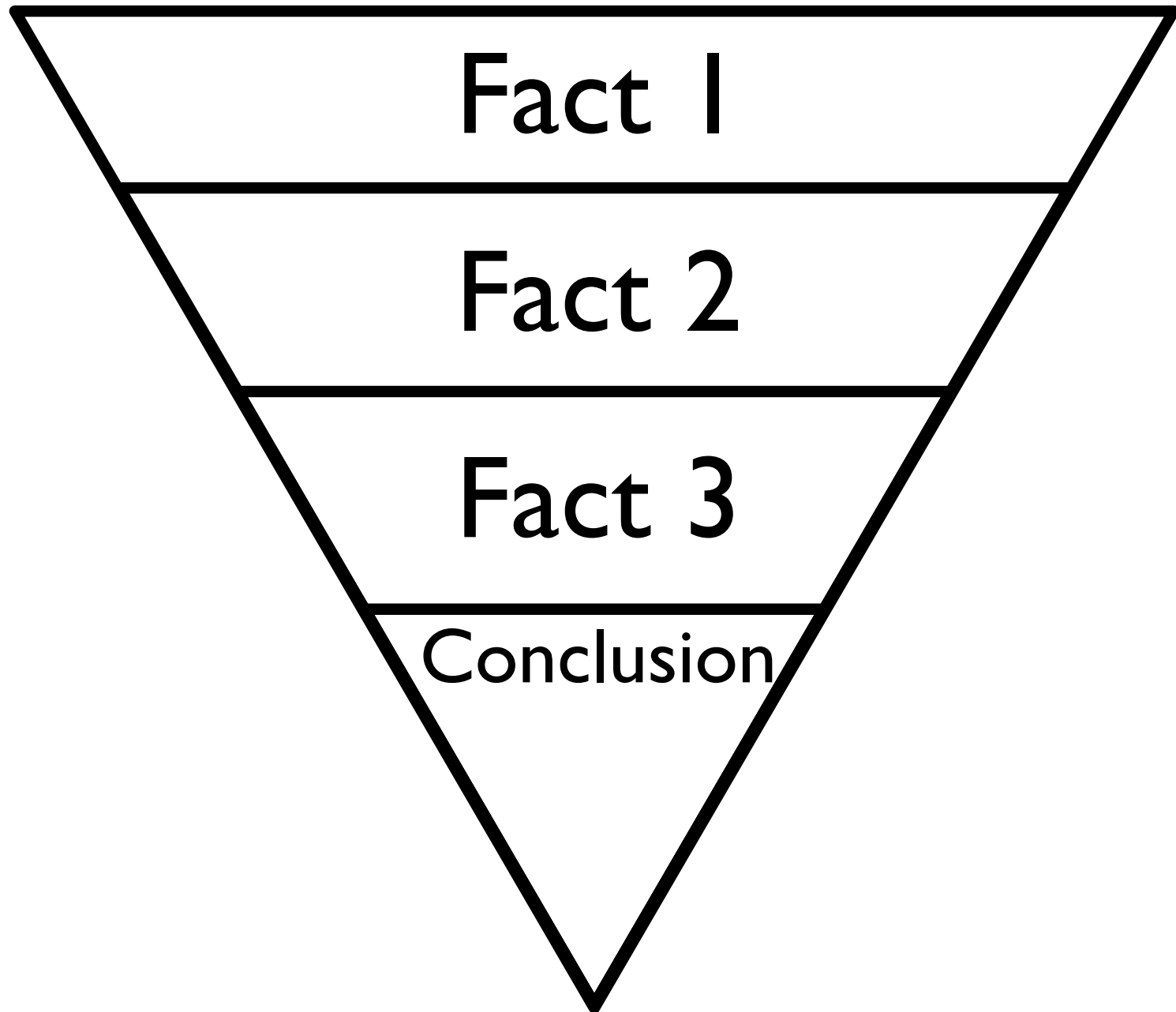This topic can be introduced with one or two sentences.

What else goes in a paragraph, besides a statement that conveys the main topic?

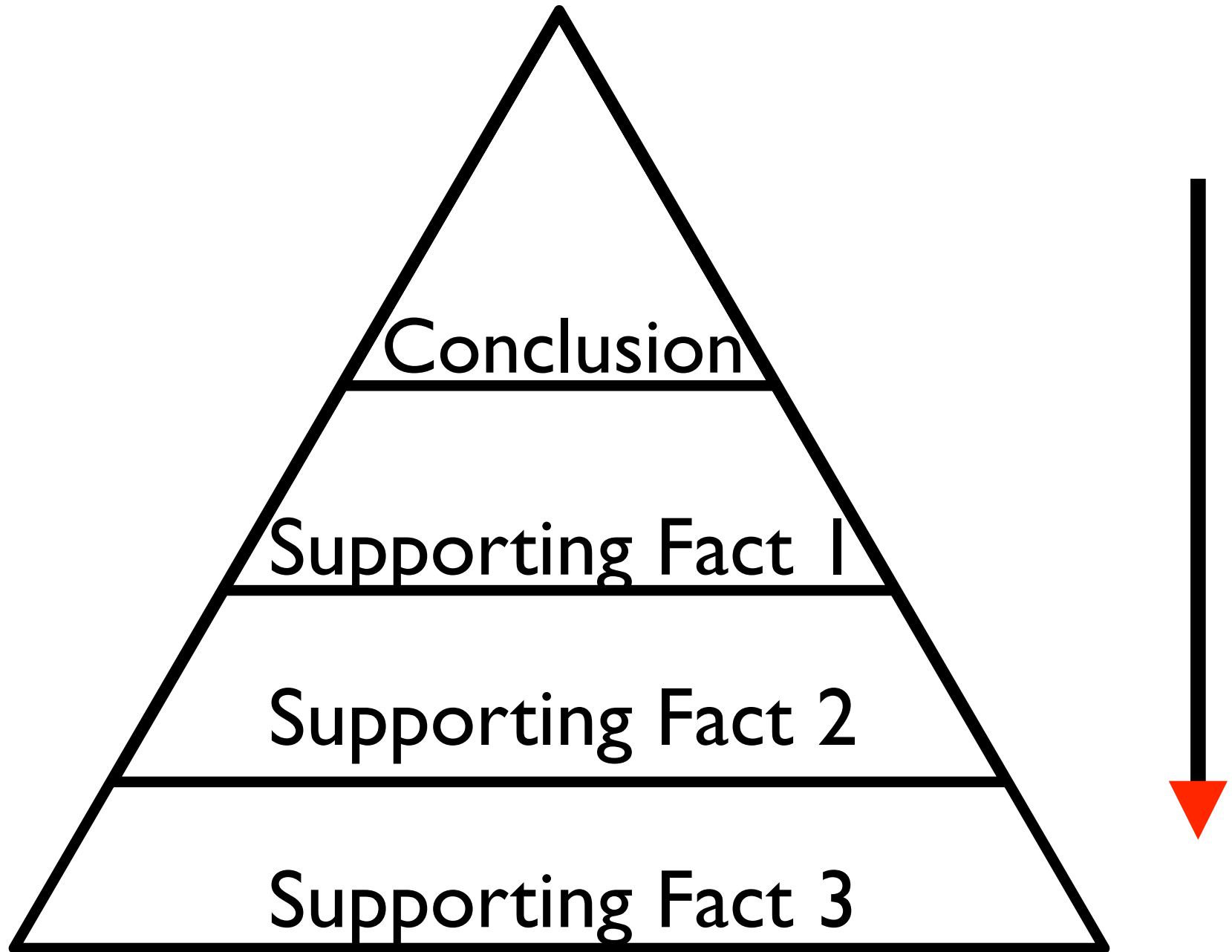Information that supports or clarifies the main topic, *only*.

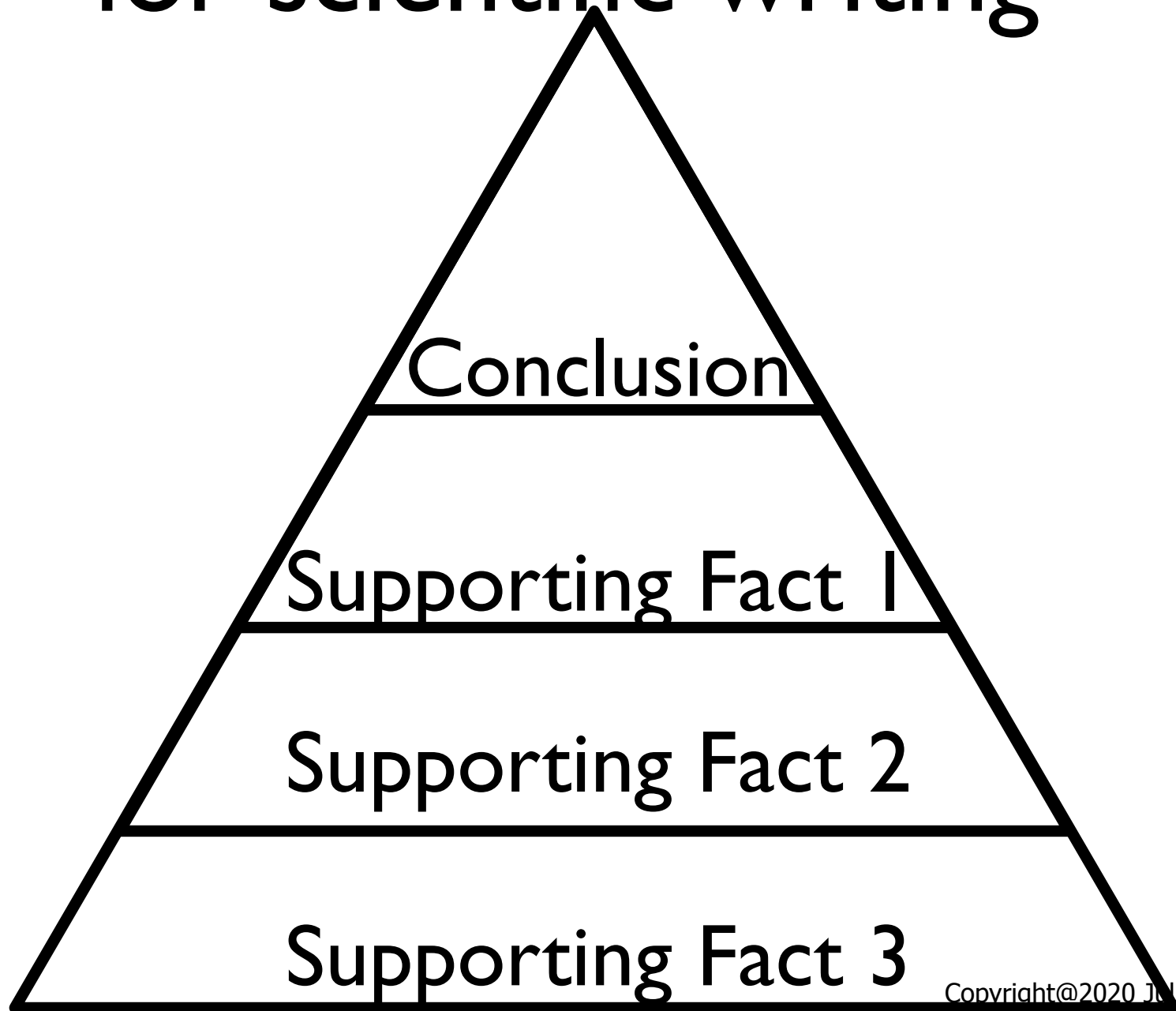# There are two ways to present supporting info in a paragraph.

Bottom up

Top down

Bottom up

45

Top Down

A pyramid divided into four horizontal sections from top to bottom: Conclusion, Supporting Fact 1, Supporting Fact 2, Supporting Fact 3. A downward arrow is shown to the right.
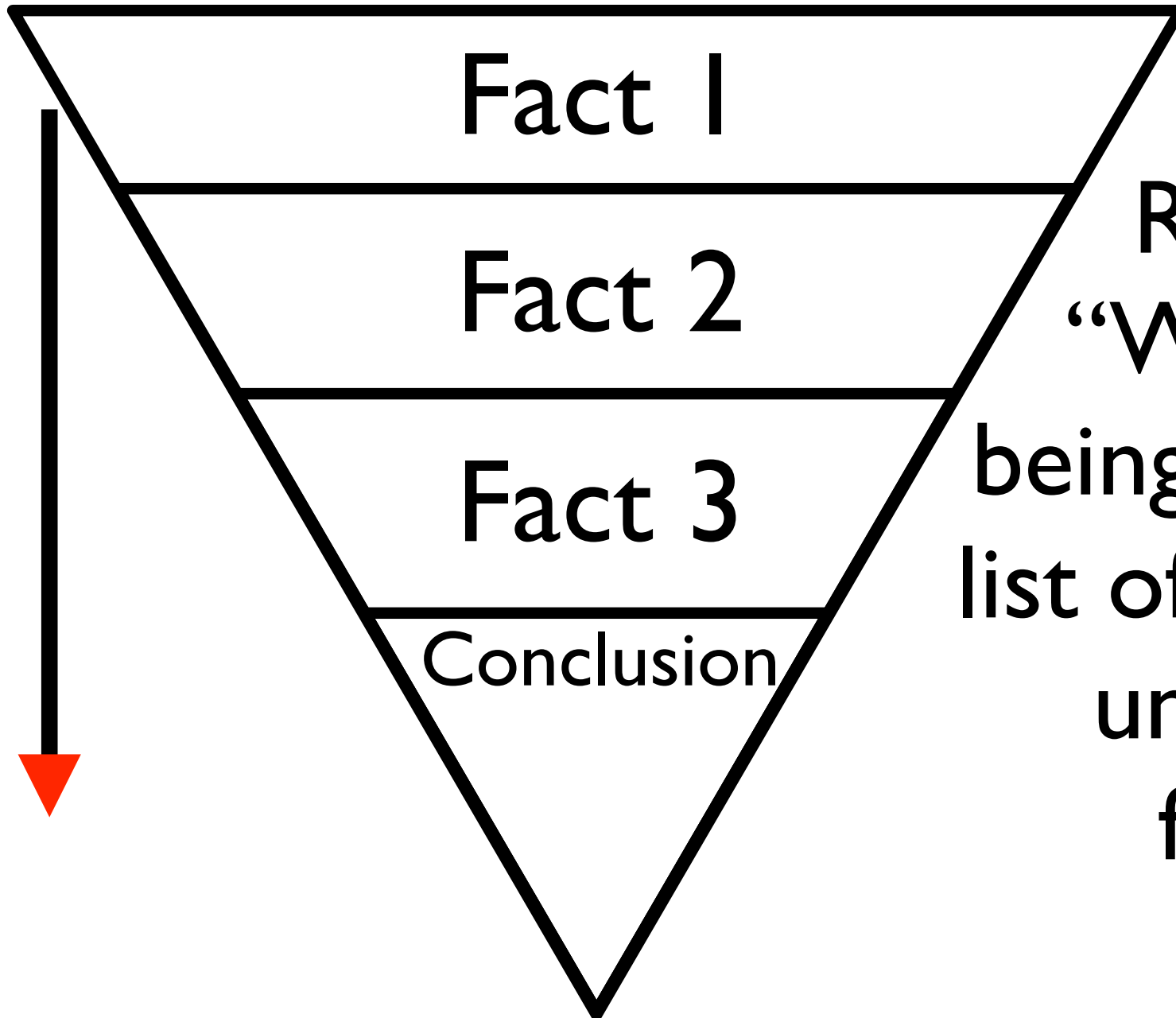
This structure is much clearer for scientific writing

The "good" paragraphs *began* with the topic, obeying this structure.
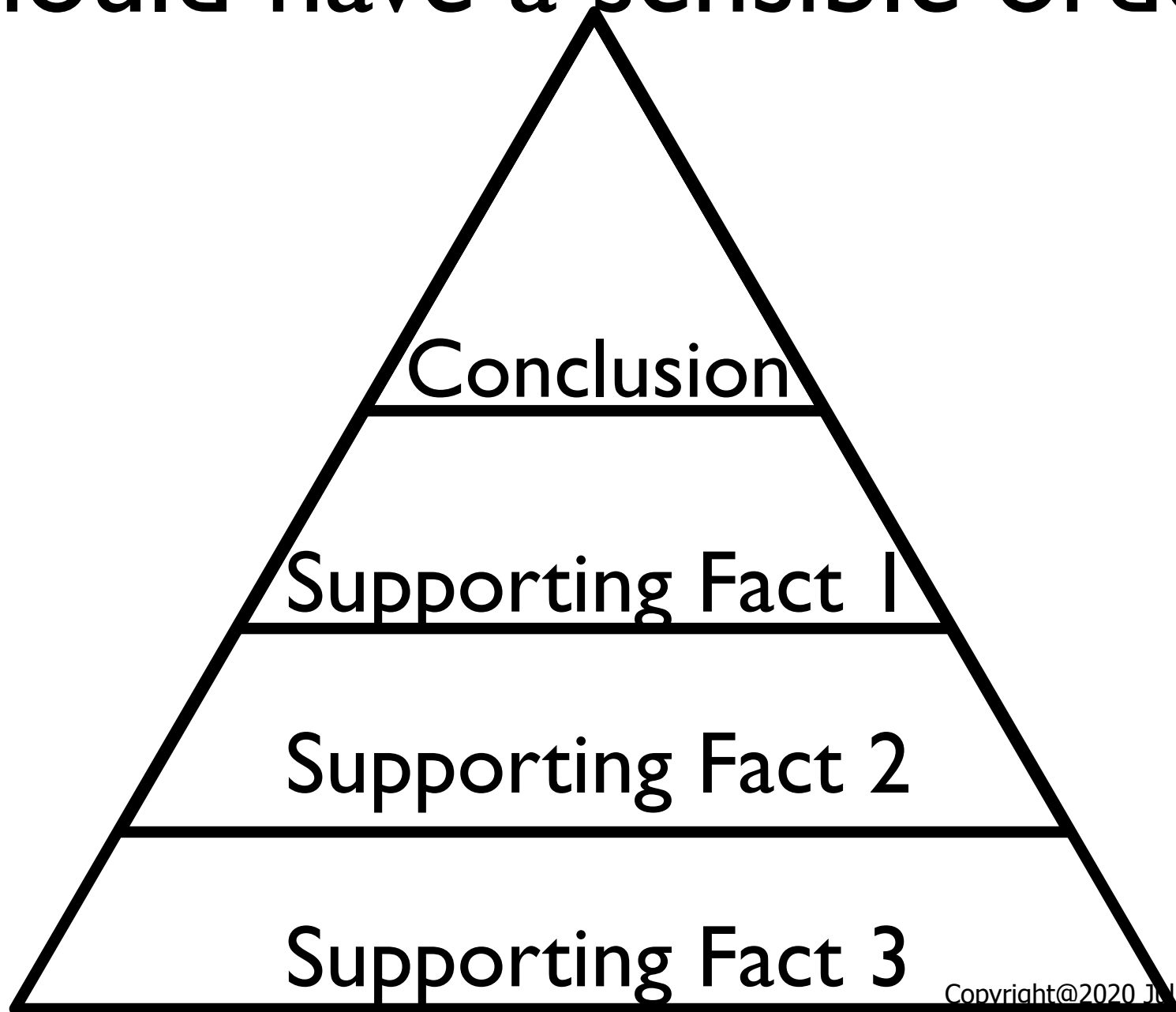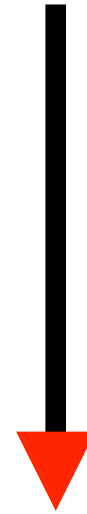
Contrast with

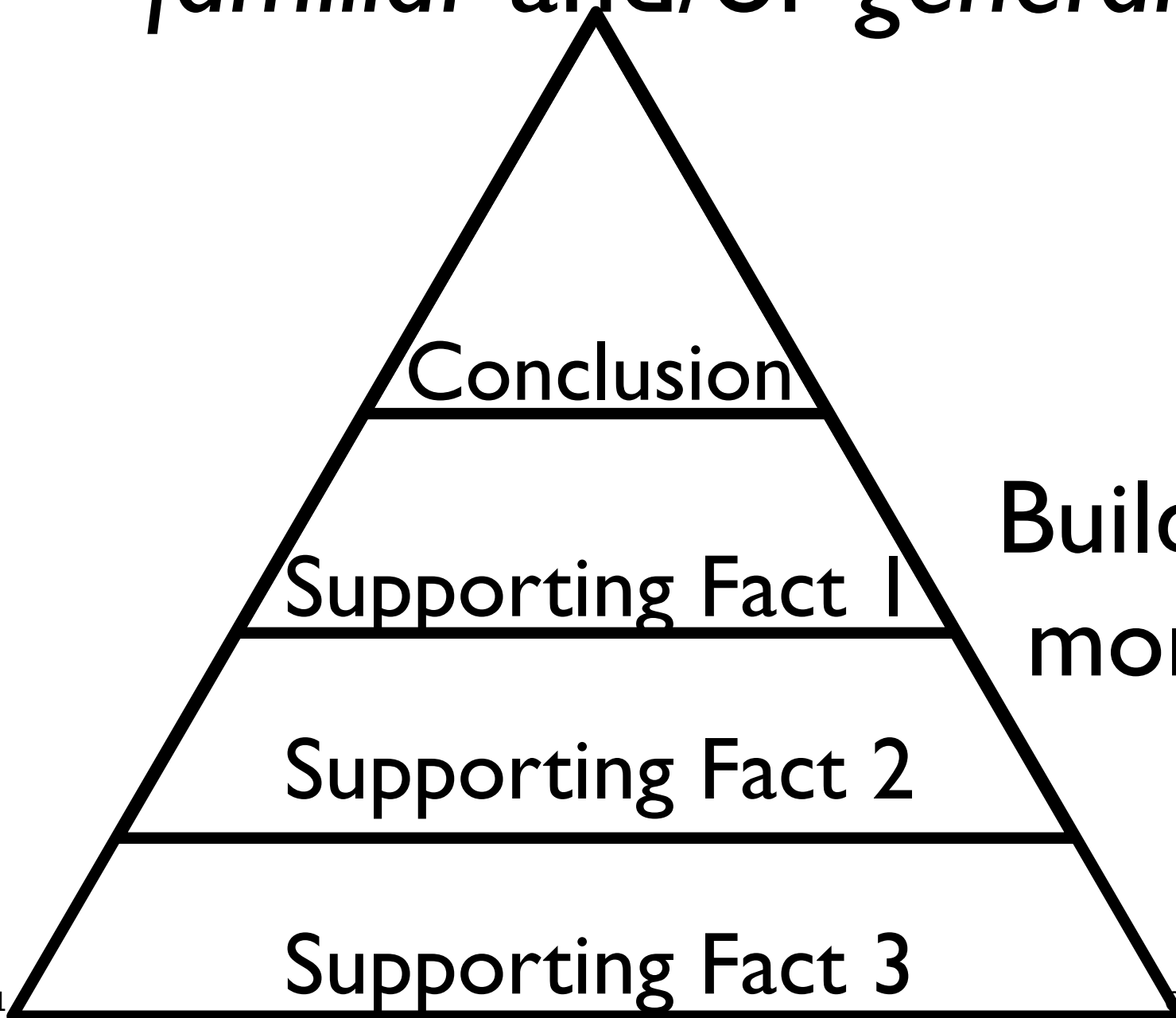Fact 1

Fact 2

Fact 3

Conclusion
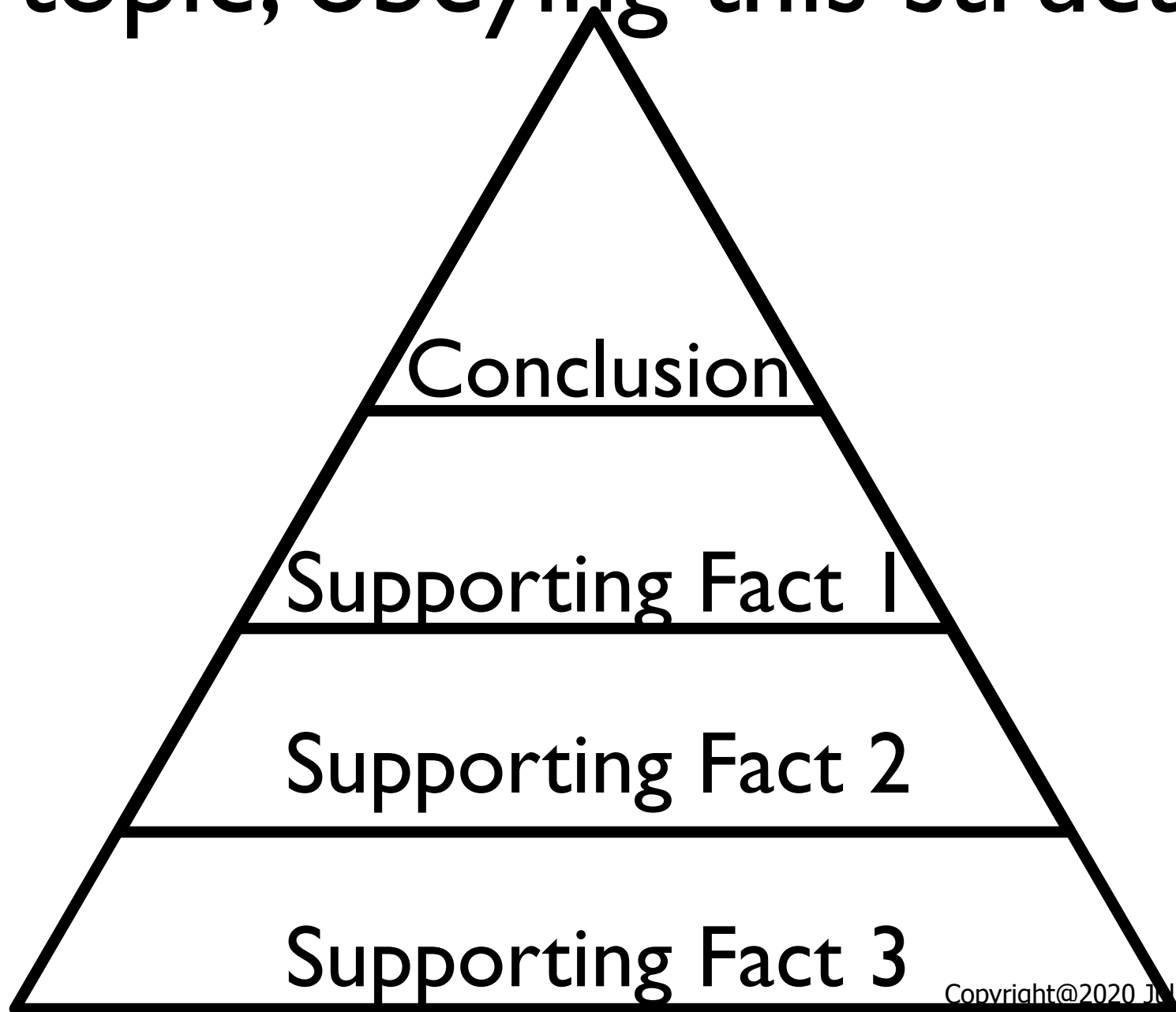
Reader: "Why am I being given this list of seemingly unrelated facts?"

The supporting information should have a sensible order.

Conclusion

Supporting Fact 1

Supporting Fact 2

Supporting Fact 3

Series should start with *most familiar* and/or *general* facts

Conclusion

Supporting Fact 1

Supporting Fact 2

Supporting Fact 3

↓

Build to newer, more specific details

# In general, order your sentences & paragraphs as follows:

- Simple to complex
- General to specific
- Familiar to unfamiliar
- First to last
- Certain to speculative
- Obvious to subtle
- Straightforward to profound

An example presenting a complex plot

1. This is a plot of X vs Y.

2. X and Y are correlated, as expected.

3. But, the correlation is weaker for large X, suggesting either a change in slope, or larger scatter in Y.

4. The color-coding suggests the larger scatter is due to the points with large Z, implying W.

5. The shift in slope occurs at X=B. This scale is where C happens, implying D.

This could easily be 4-7 paragraphs of discussion!

The last fact/sentence is in a "stress position"

Conclusion

Supporting Fact 1

Supporting Fact 2

Supporting Fact 3
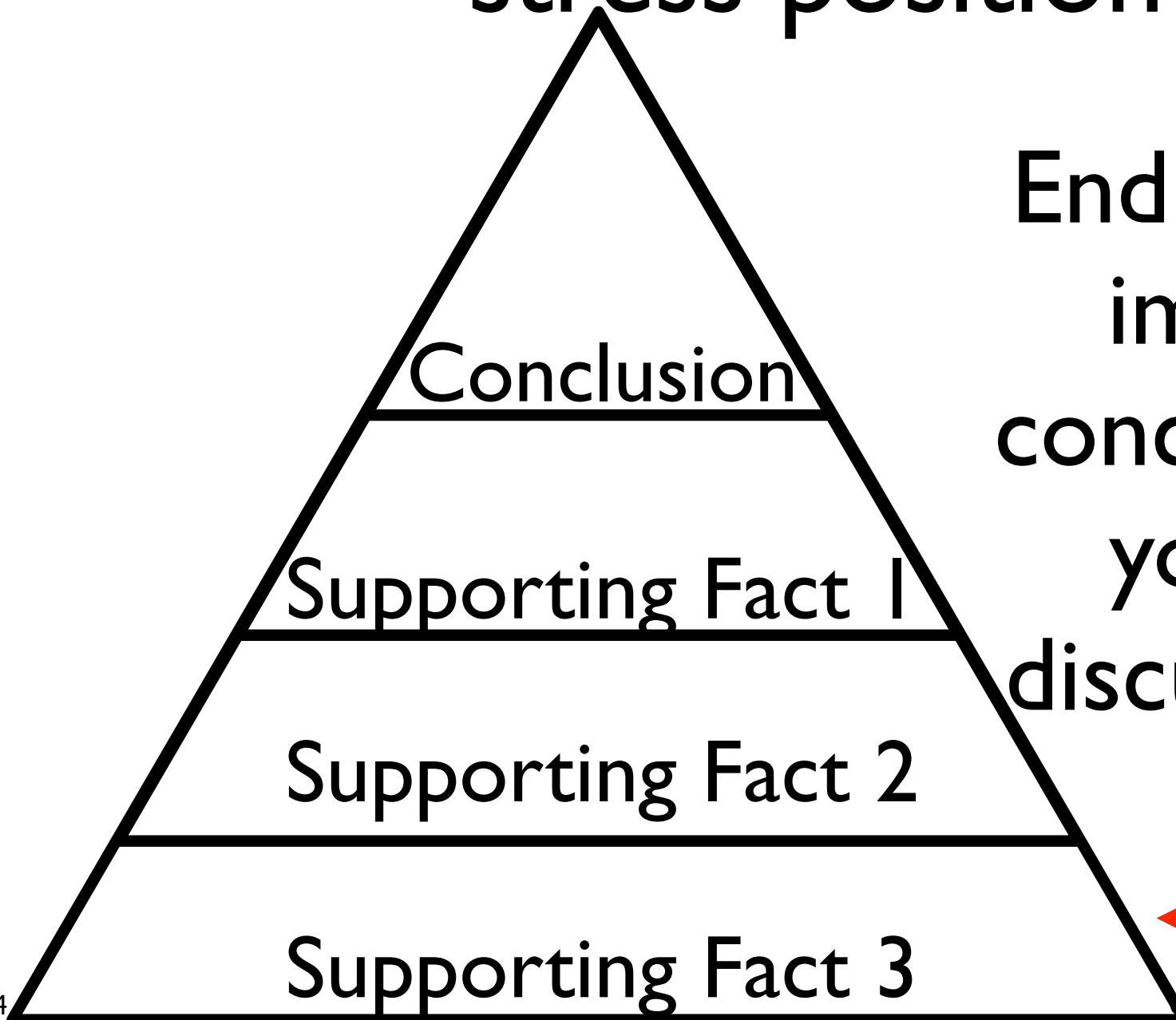
End with most important conclusion that you might discuss further

Good structure for building nuance.

Conclusion

Supporting Fact 1

Supporting Fact 2

Supporting Fact 3

More detailed, nuanced conclusion
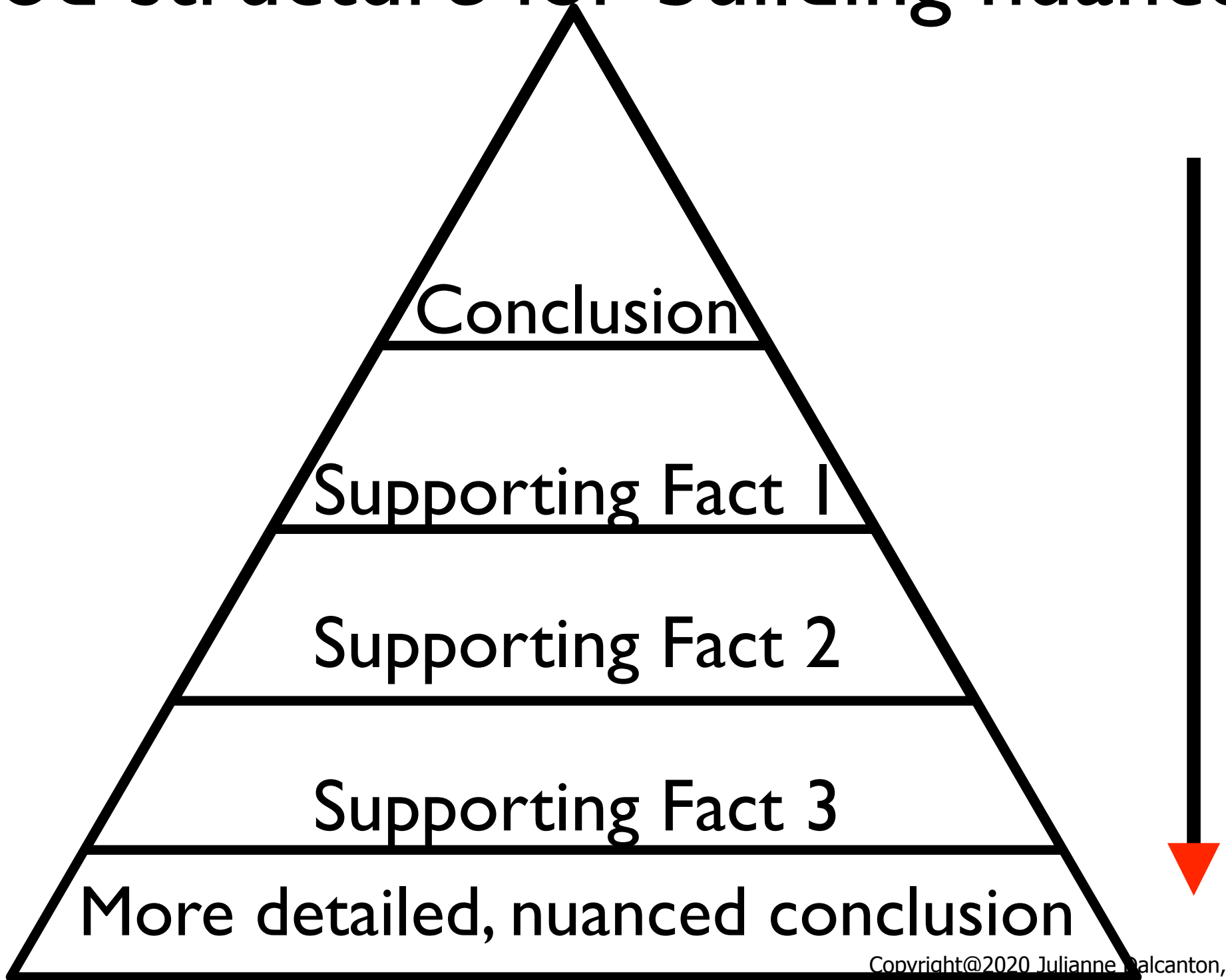
Example of top down, building nuance

Selection effects are severe for transit surveys. In addition to the obvious requirement that the planetary orbit be oriented nearly perpendicular to the sky plane, there are strong biases favoring large planets in tight orbits. In an idealized wide-field imaging survey, the effective number of stars that can be searched for transits varies as the orbital distance to the 5/2 power and the planet radius to the sixth power (Pepper et al. 2003). It is a struggle to bring the occurrence rate to light when buried beneath such heavy biases.
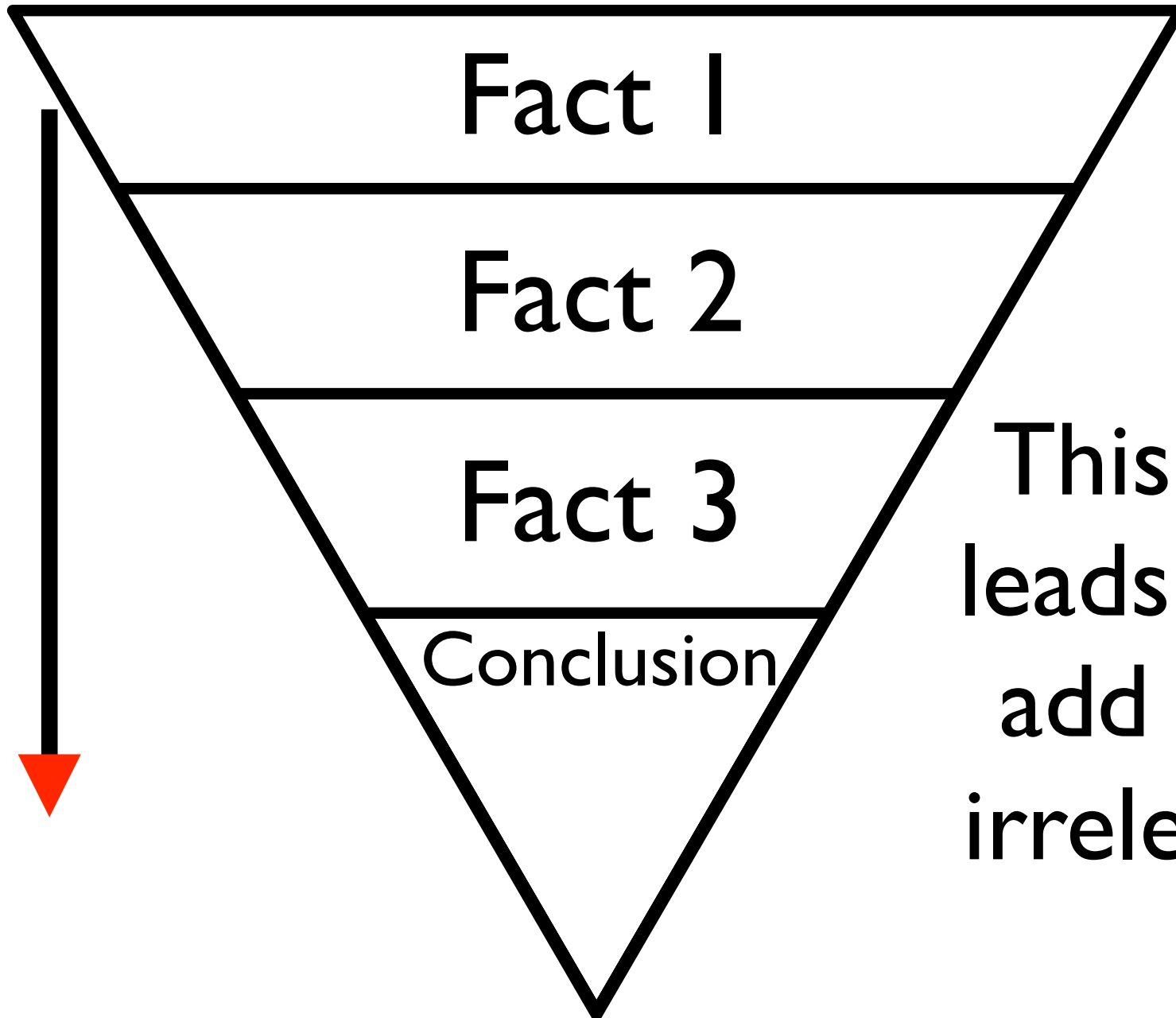
Winn & Fabrycky 2015
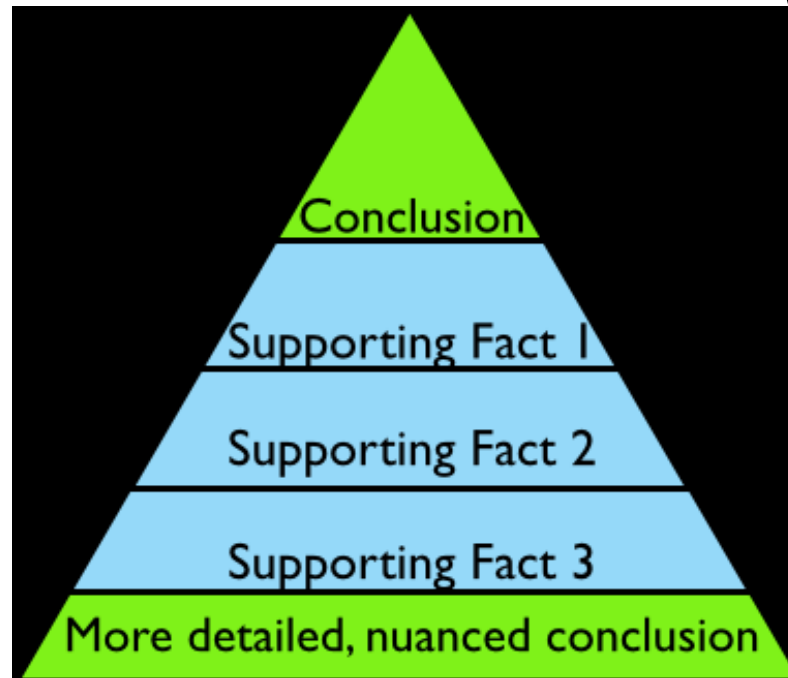
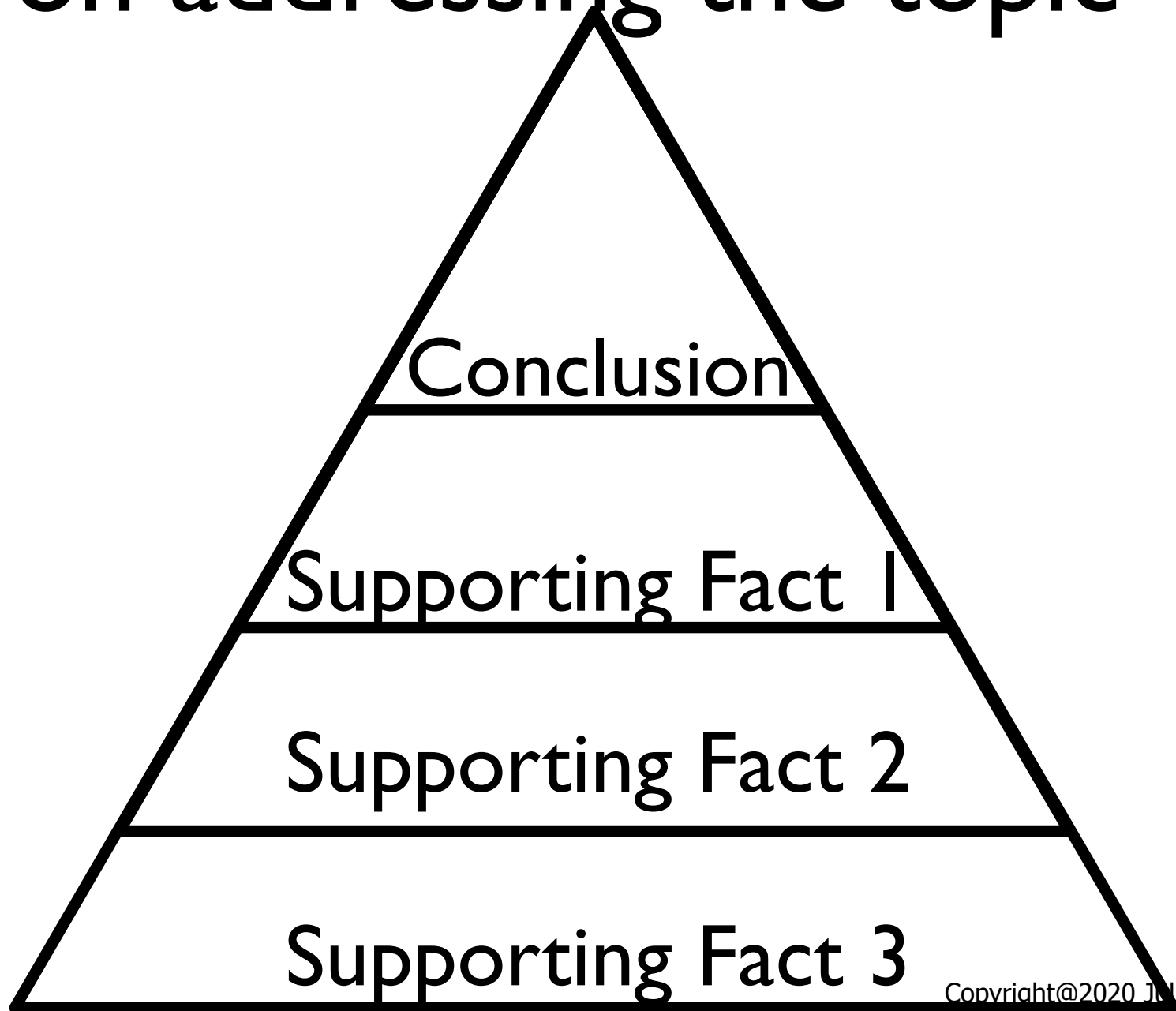# This structure favors shorter, direct sentences
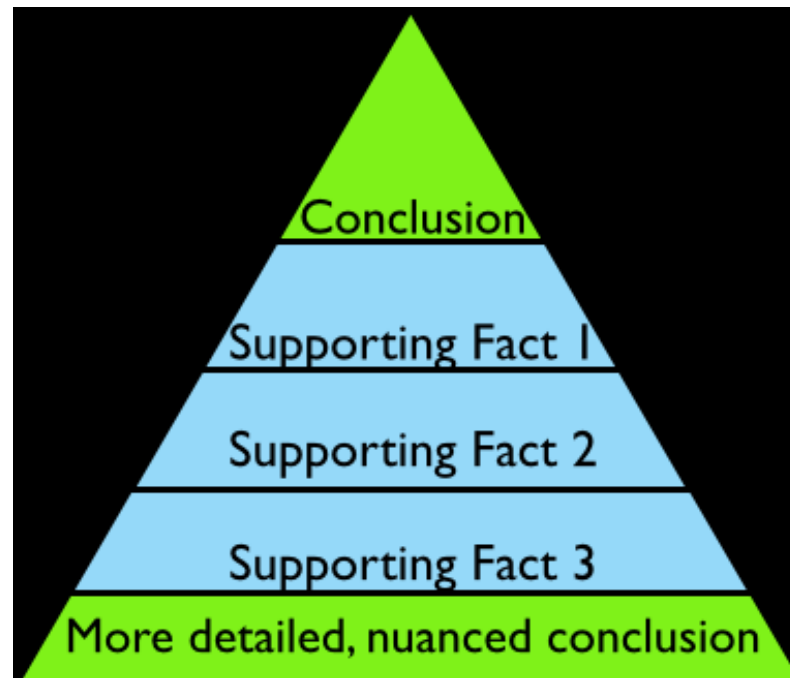
No one sentence is required to do everything.

Another, secondary problem

Fact 1

Fact 2

Fact 3

Conclusion

This structure leads writers to add too much irrelevant detail

This structure focuses the writer on addressing the topic

Conclusion

Supporting Fact 1

Supporting Fact 2

Supporting Fact 3

There is a *lot* one could say about transit spectroscopy....

The currently most productive set of indirect techniques for observing exoplanet atmospheres are those for systems where the planet transits and is eclipsed by its host star. These techniques do not require high spatial resolution, as the planet and star do not need to be spatially separated on the sky. Observations are made in the combined light of the planet and star (Figure 3-7) with the exoplanet spectrum separated out by comparison with observations of the star alone. As seen from a telescope, when the planet goes in front of the star, the starlight passes through the planet atmosphere and planet atmosphere spectral features are imprinted on the stellar spectrum. This is called transmission photometry or spectroscopy. When the planet goes behind the star, the planet disappears and reappears, adding either reflected light or thermal emission to the combined planet-star radiation. This is referred to as secondary eclipse photometry or spectroscopy.

But here, tone is kept "big picture"

X

Effective paragraphs show restraint, such that only *directly pertinent* information is included

Both papers and proposals favor coherent, "single topic" paragraphs.

(Albeit for different reasons, and with different degrees of conciseness)

For a paper, you can take as many paragraphs as you need to tell your story.

Don't rush.

For a proposal, you cannot waste space, nor can you include nuance that would confuse non-experts.

Don't burden your text with unnecessary information.