

Data Visualizations & Graphical Storytelling for Data Analysts and Data Scientists

The Importance of Context

Dr Cédric Scherer

Hello Heart // March 2024



The Importance of Context



*“Visualizations can be designed and experienced
in various ways, by people of various
backgrounds, and in various circumstances.*

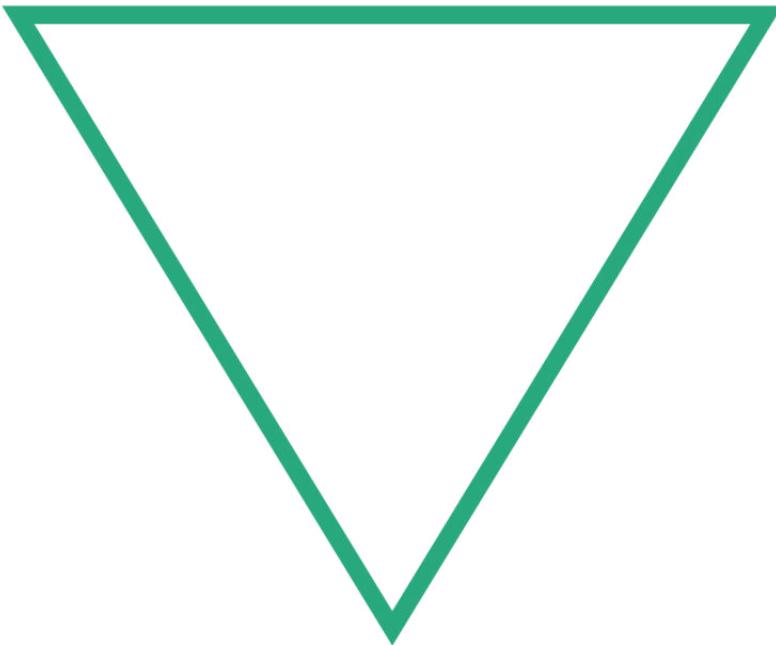
*That’s why reflecting on the purpose of a
visualization is paramount before we design it
—or before we critique it.”*

A. Cairo (2021)



Exploratory
Discovery

Explanatory
Communication



Affective
Emotion

“Vertices of Visualization” by Alberto Cairo, personal communication (modified version)

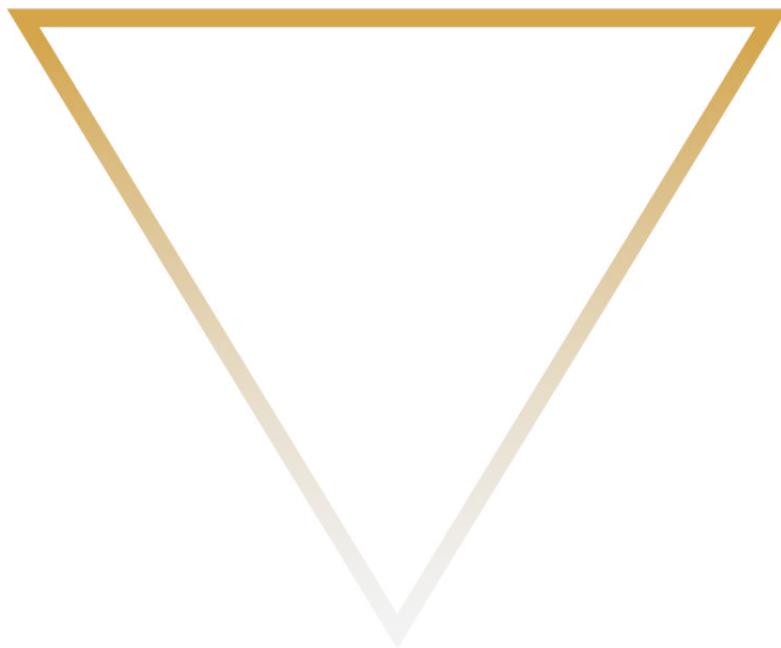


Exploratory
Discovery

Explanatory
Communication

Priority:
efficient + effective

Response:
functional



Affective
Emotion

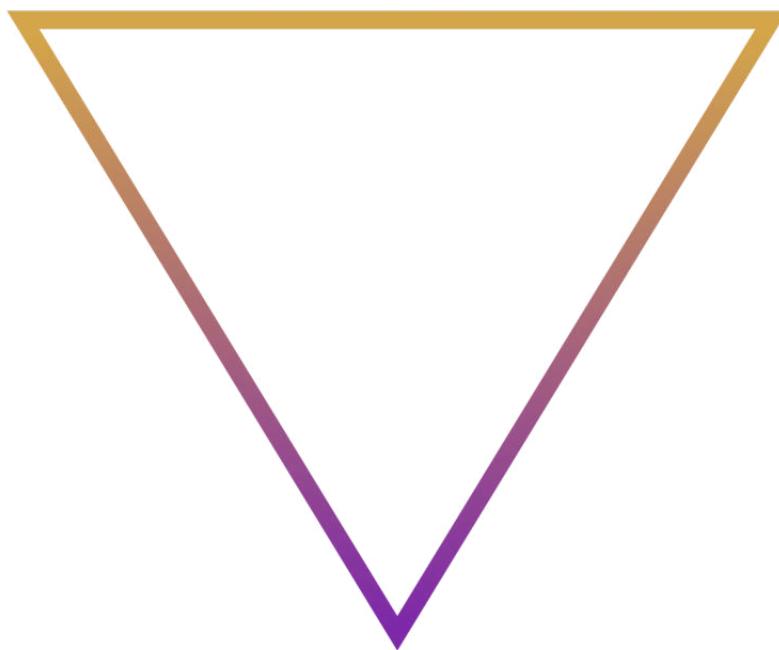
“Vertices of Visualization” by Alberto Cairo, personal communication (modified version)



Exploratory
Discovery

Explanatory
Communication

Affective
Emotion



Priority:
efficient + effective

Response:
functional



Priority:
creative + novel

Response:
emotional

“Vertices of Visualization” by Alberto Cairo, personal communication (modified version)



MONSTROUS COSTS

Total House and Senate campaign expenditures,
in millions



Source: "Monstrous Costs" by Nigel Holmes

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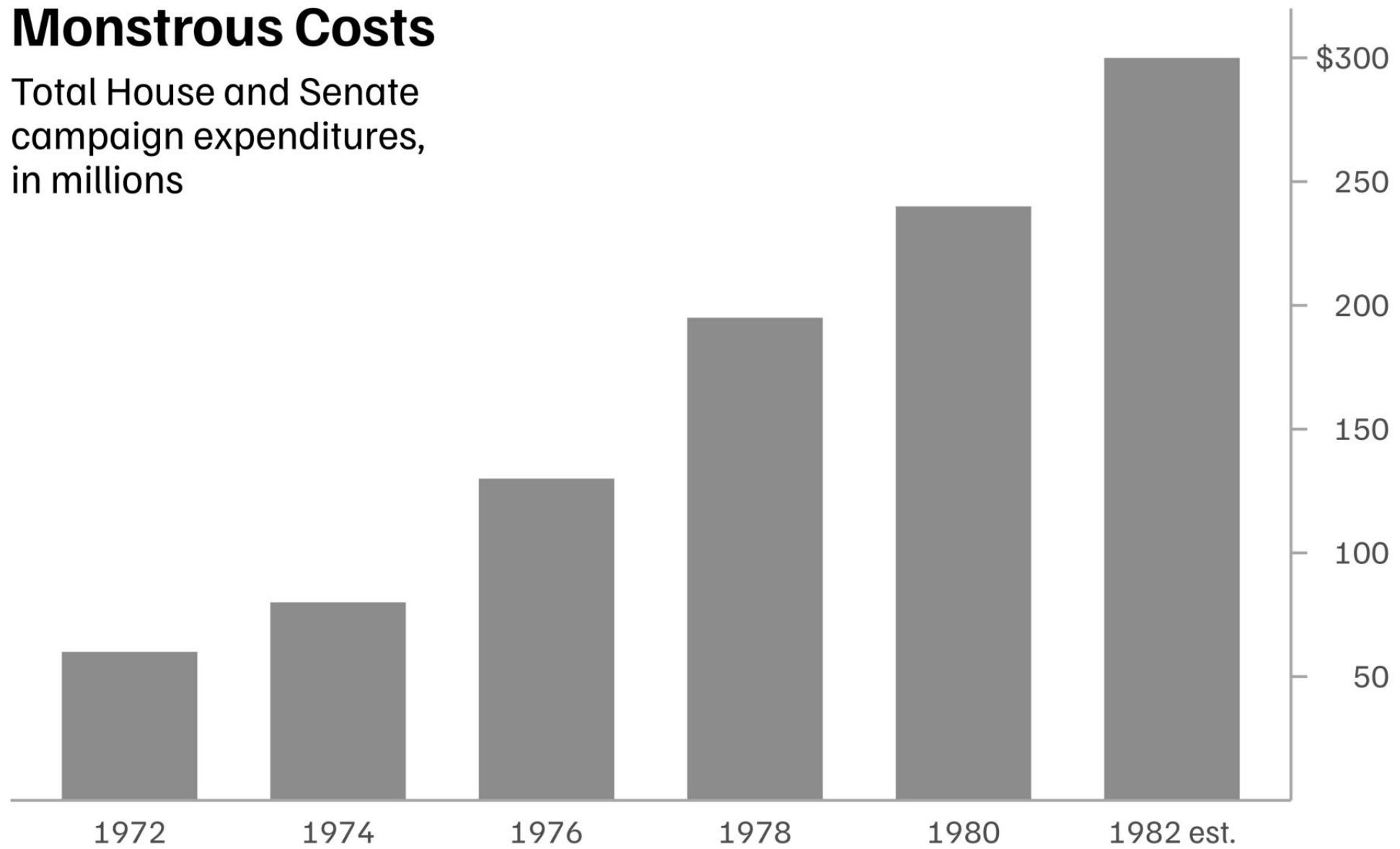
“The larger the share of a graphic’s ink devoted to data, the better.”

E. Tufte (1983)



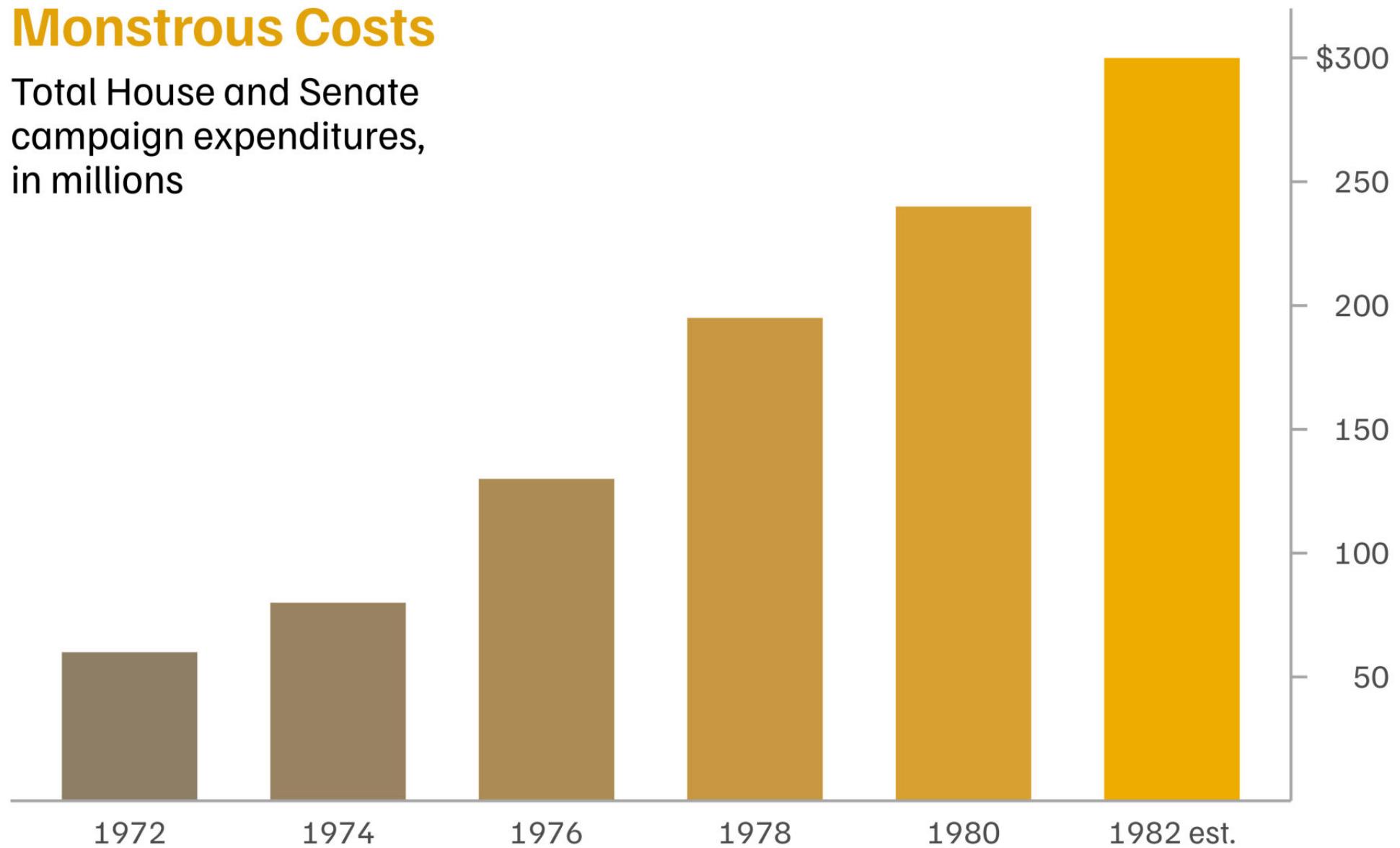
Monstrous Costs

Total House and Senate
campaign expenditures,
in millions



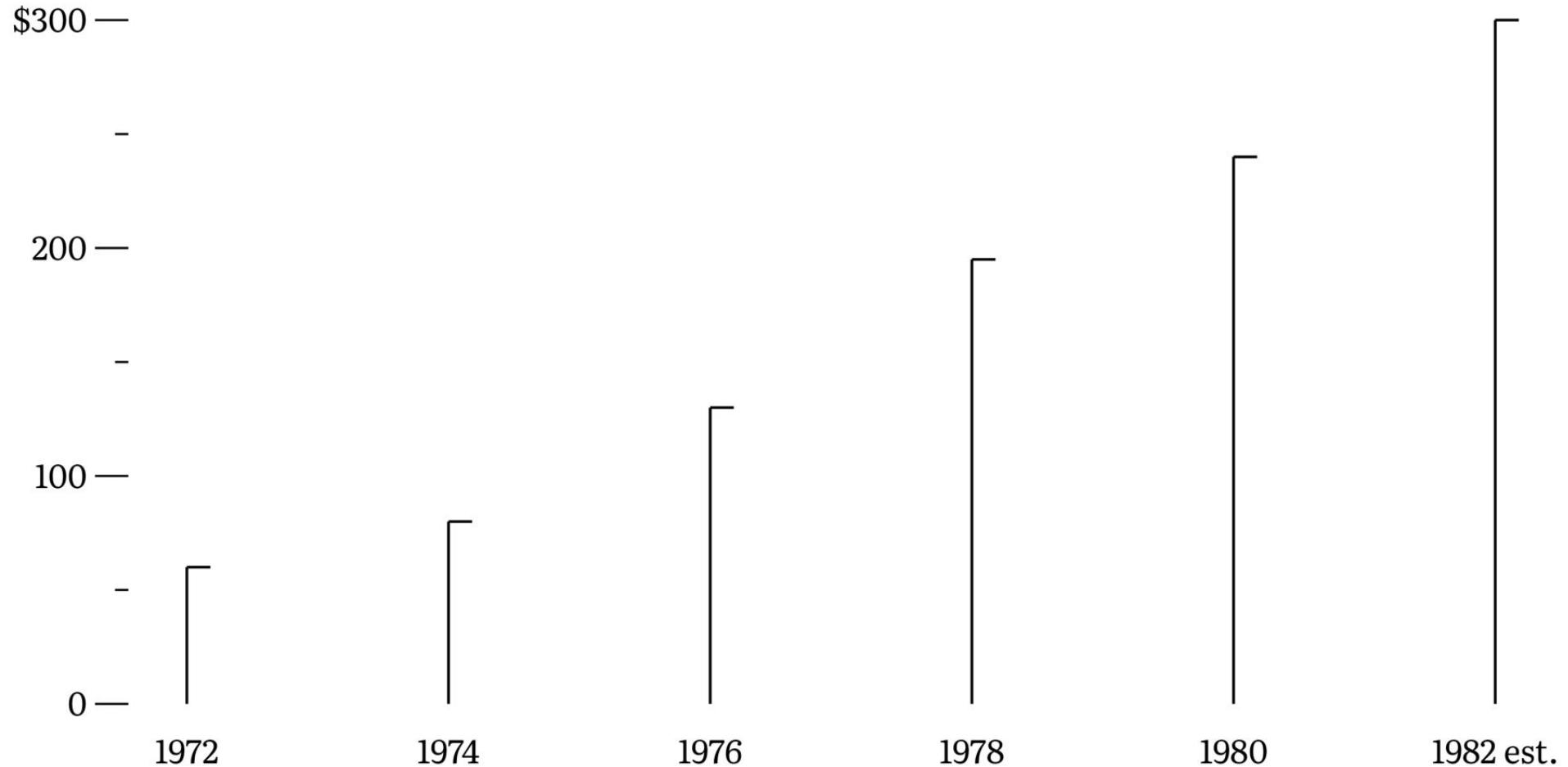
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Monstrous Costs

Total House and Senate campaign expenditures, in millions



*“People’s accuracy in
describing the embellished charts was
no worse than for plain charts, and [...]
**their recall after a two-to-three week
gap was significantly better.”***

S. Bateman et al. (2010)

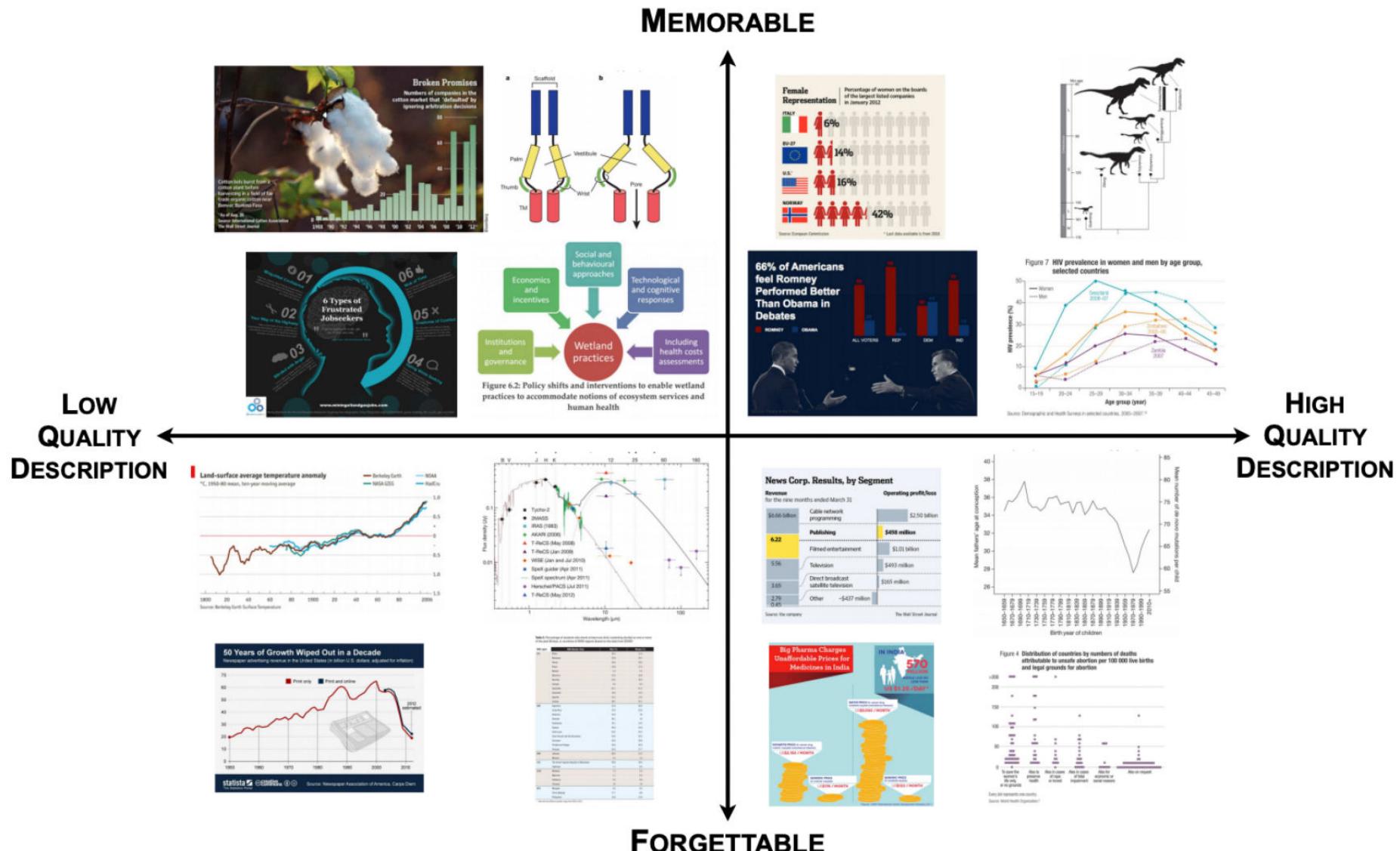


*“It appears that **novel and unexpected visualizations can be better remembered than the visualizations with limited variability that we are exposed to since elementary school.**”*

M. A. Borkin et al. (2013)



MEMORABILITY VERSUS DESCRIPTION QUALITY



Source: Borkin et al. (2013)

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Audience (who)

- To whom are you communicating?
- What do they already know?
- What is your position and relationship?



The “Who”

Your Audience

- specify target audience
- avoid too general specifications
- generate different products for different audiences

You

- specify relationship you have with the audience
- avoid wrong expectations
- generate different products for different actions





the audience

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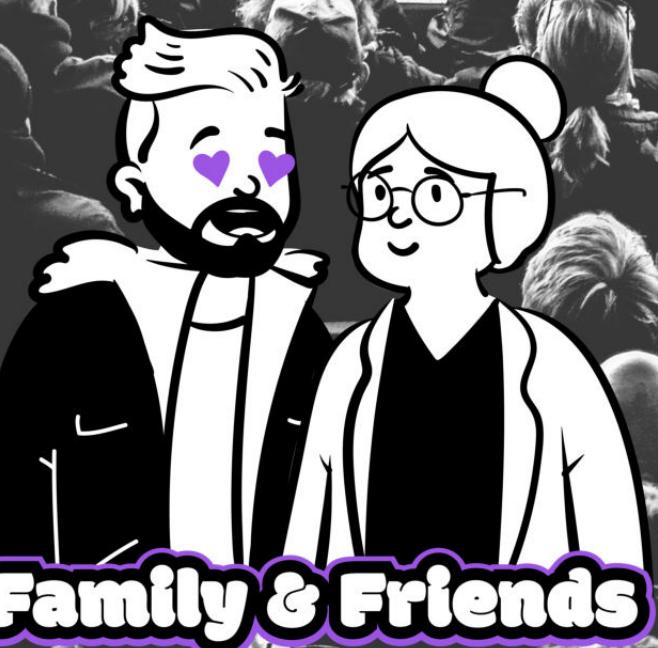




Who is the audience?



Colleagues &
Experts



Family & Friends



Spectators &
Critics



Audience (who)

- To whom are you communicating?
- What do they already know?
- What is your position and relationship?

Content (what)

- What do you want them to know or do?
- How will you communicate with them?
- What tone do you want your communication to set?



The “What”

Action

- articulate the take-home message
- prompt productive reactions or conversations

Mechanism

- identify the primary communication method
- adjust level of detail to the medium and your audience

Tone

- think about the mood desired for communication



The 3-Minute Story

Imagine that you have only **three minutes**
to tell your audience what they **need to know or do**

—what would you say?



The Big Idea

Imagine you have to condense your story to a **single sentence** to convey **what's unique** about your point and **what's at stake**

—**what would you say?**



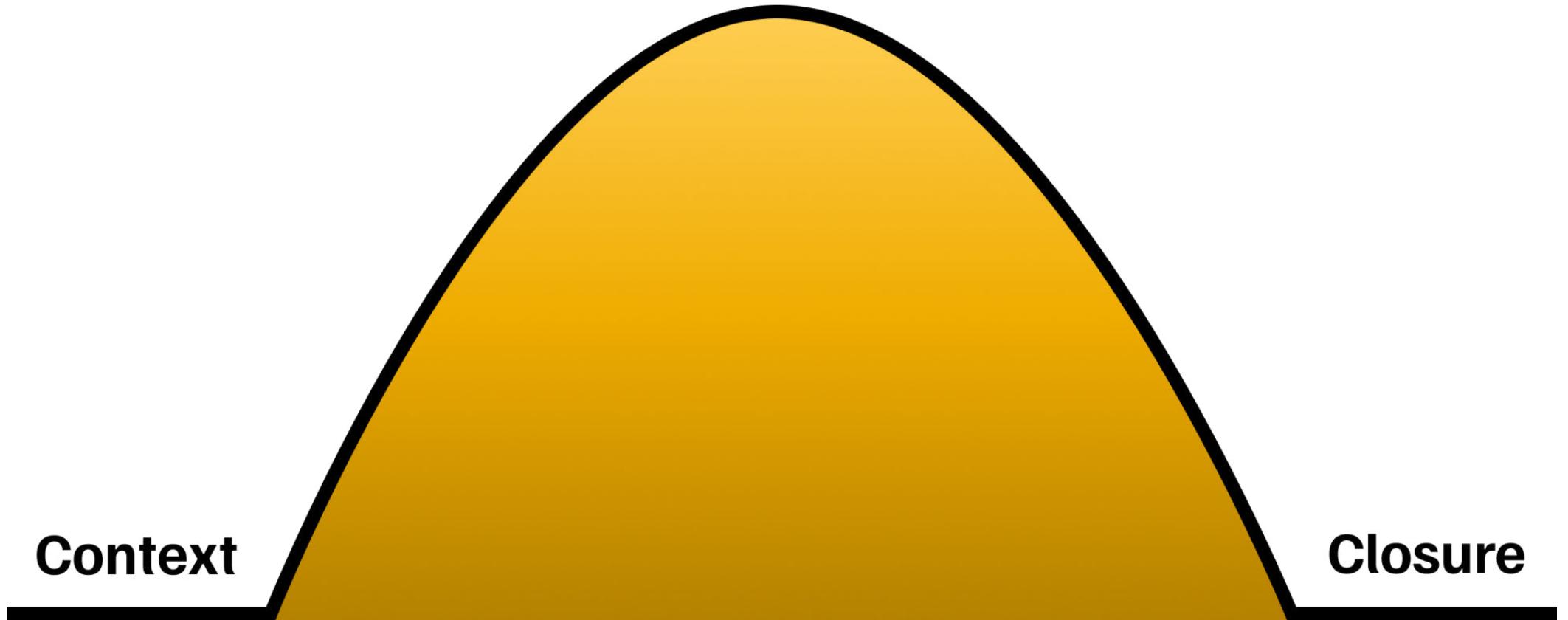
Storyboarding

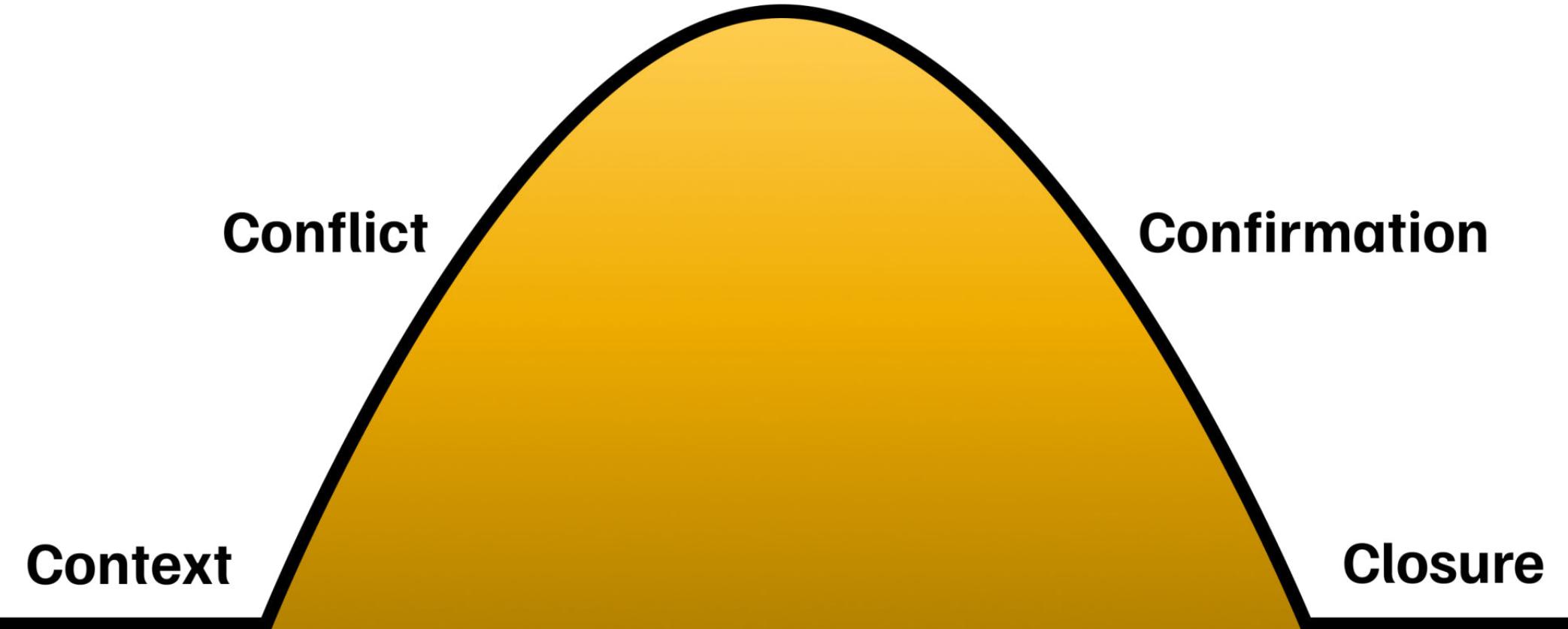
Based on your 3-minute story and big idea,
create notes that contain steps to

- 1. introduce the topic**
- 2. showcase the issue**
- 3. demonstrate potential solutions**
- 4. provide evidence**
- 5. recommend action (or discussion)**



Climax





Climax

Conflict

Confirmation

Context

Closure



*demonstrate
potential solutions*

Climax

*showcase
the issue*

Conflict

*introduce
the topic*

Context

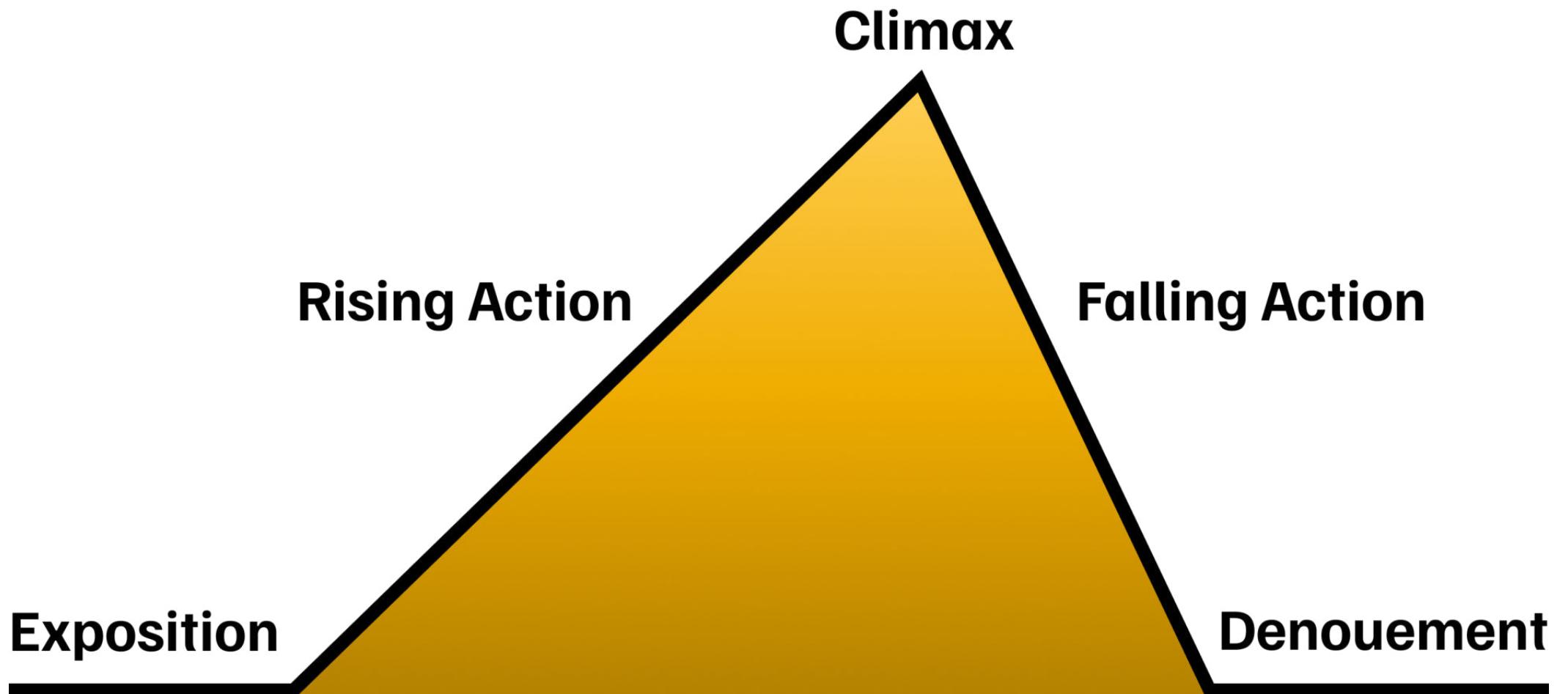
*provide
evidence*

Confirmation

*recommend
action*

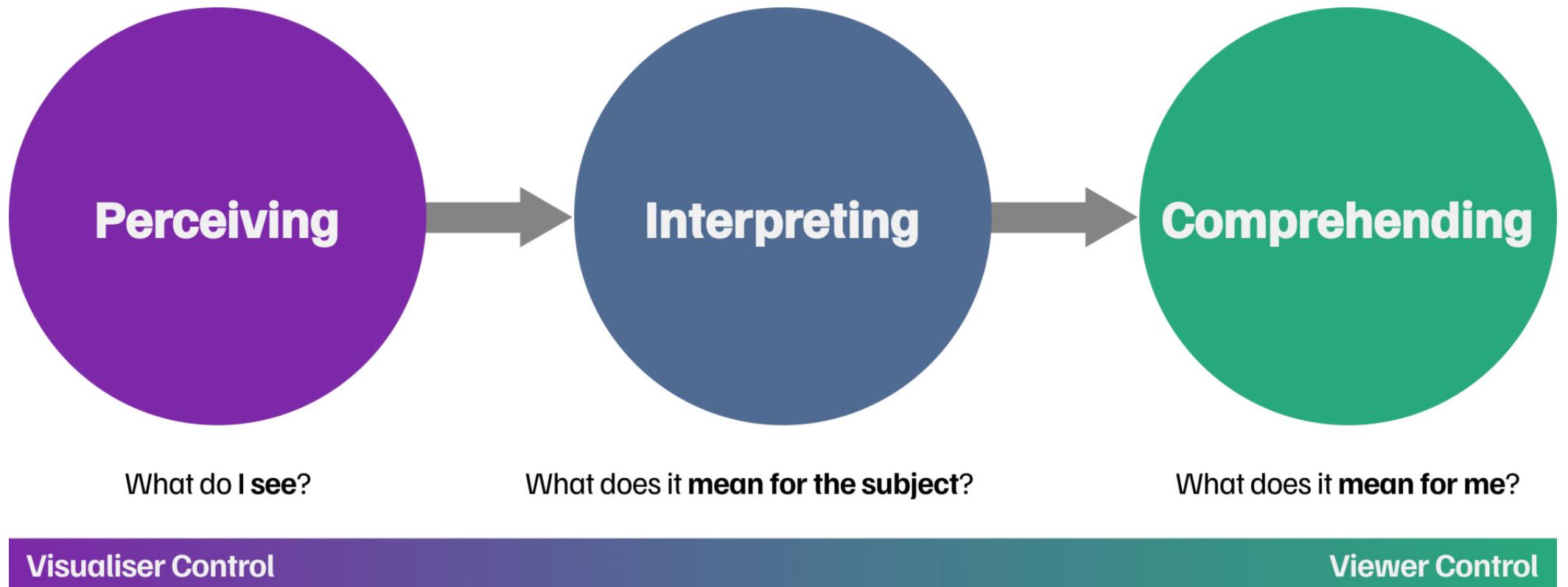
Closure





Narrative arc visualized as “Freytag’s triangle”



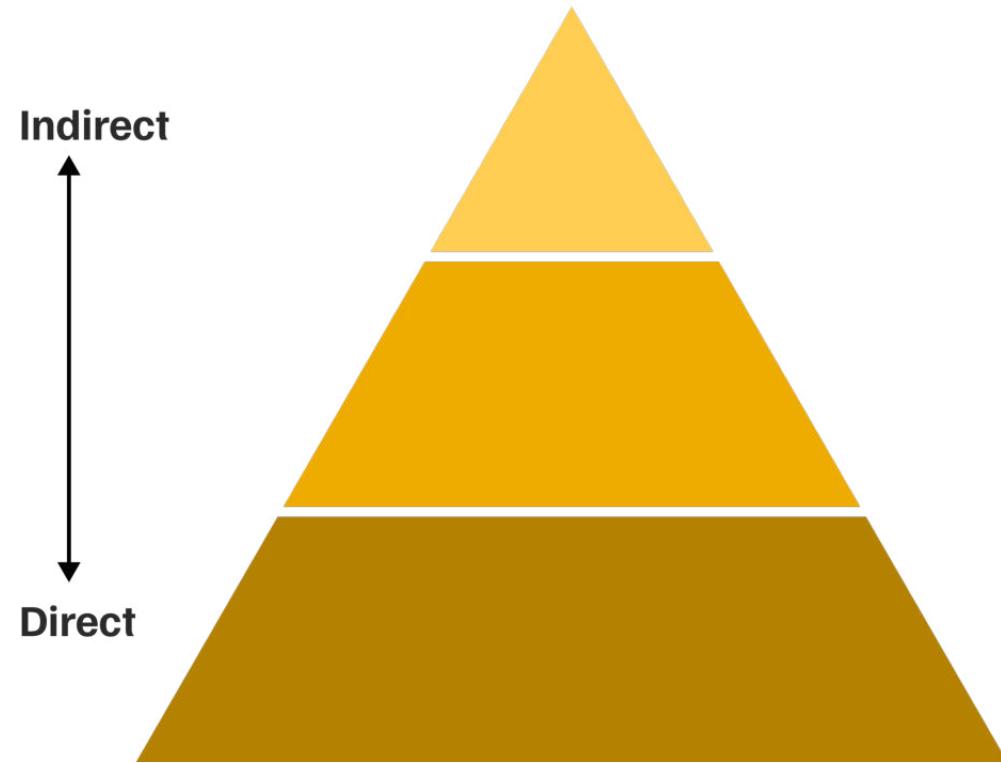


Scheme by Andy Kirk (modified)

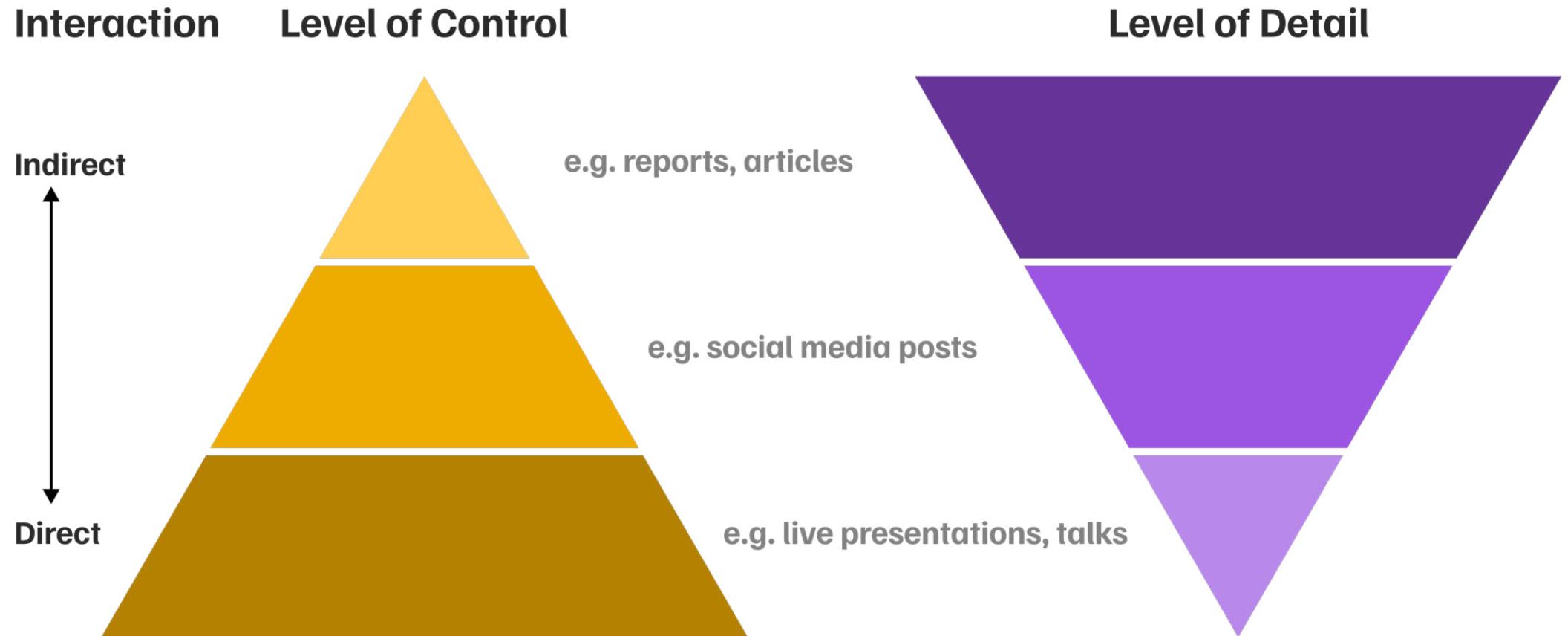


Communication Method Defines Control

Interaction Level of Control



Communication Method Defines Detail



Communication Method Defines Detail

Written Documents

- provide enough detail
- add labels and explanations
- avoid jargon and abbreviations
- sufficient font sizes

Live Presentations

- remove unnecessary details
- reduce amount of text
- reveal data gradually
- large font sizes



inspirational

celebrating

spicy

warning

joyful

serious

cheering

DRIVING

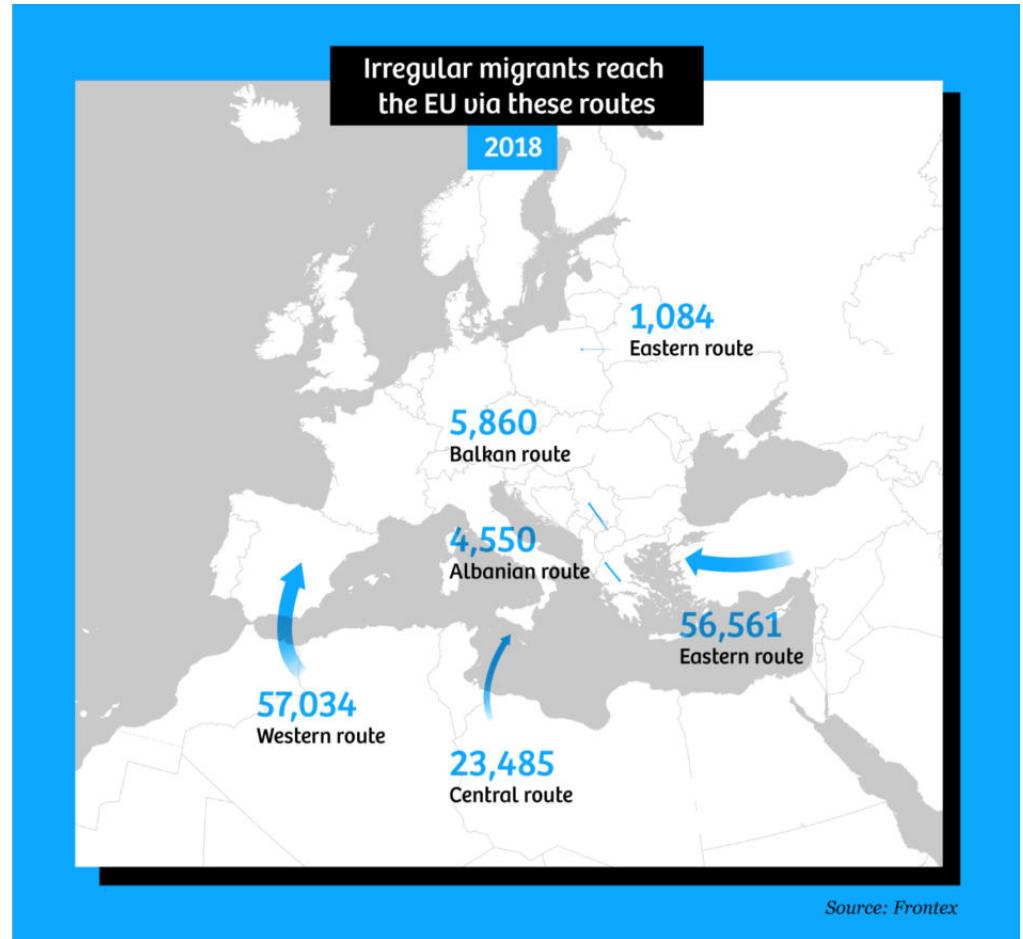
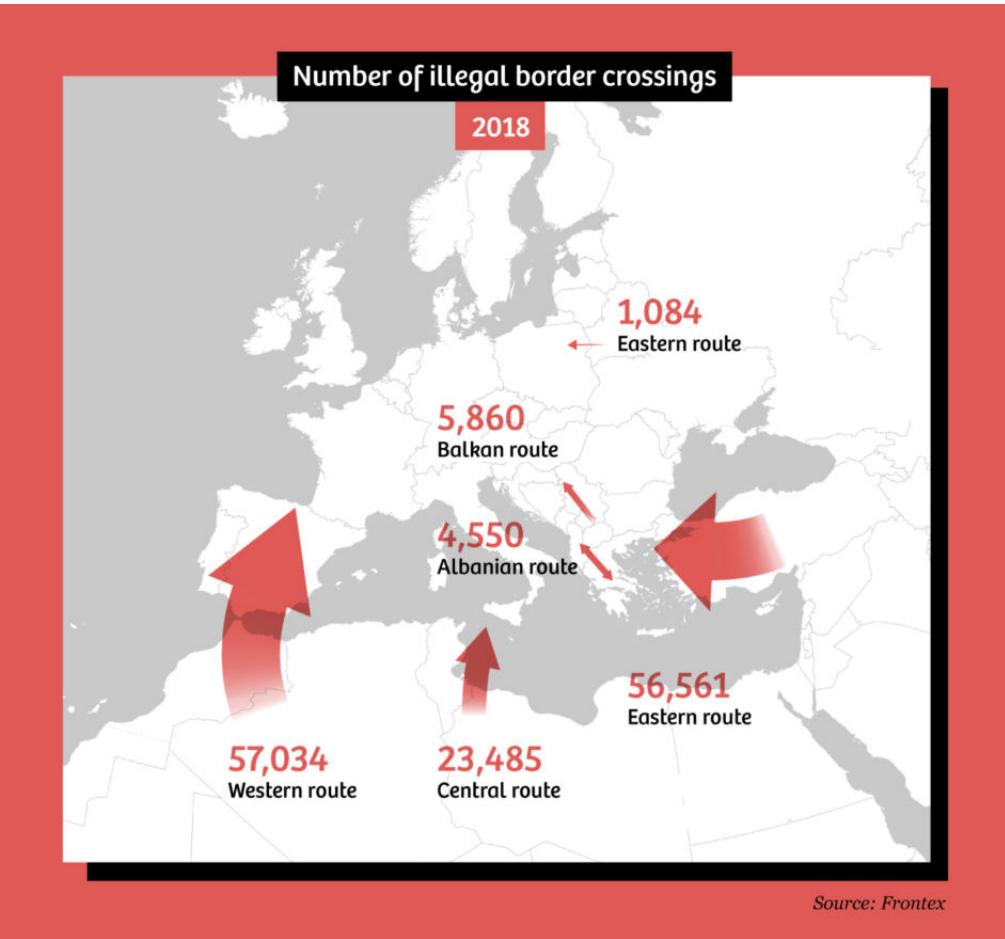
lighthearted

educational

urgent

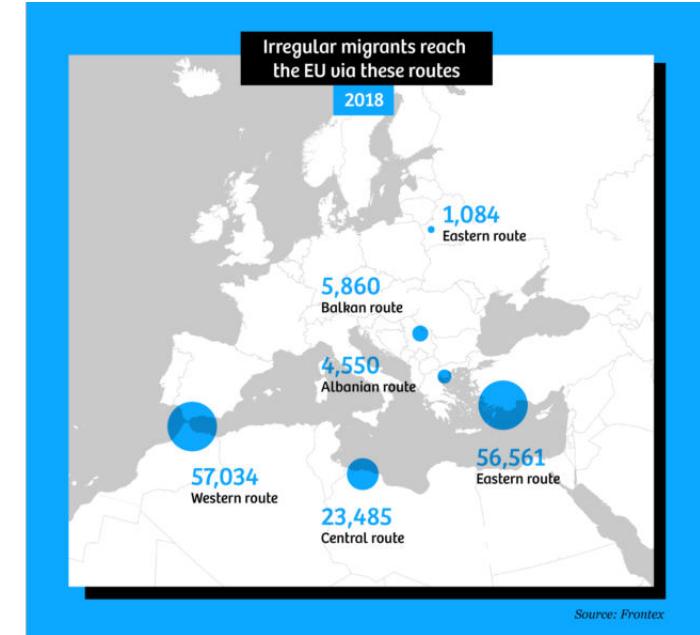
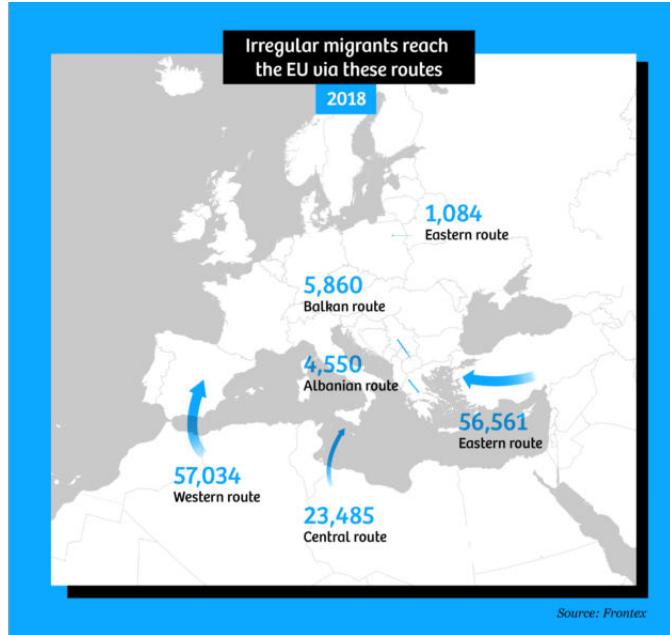
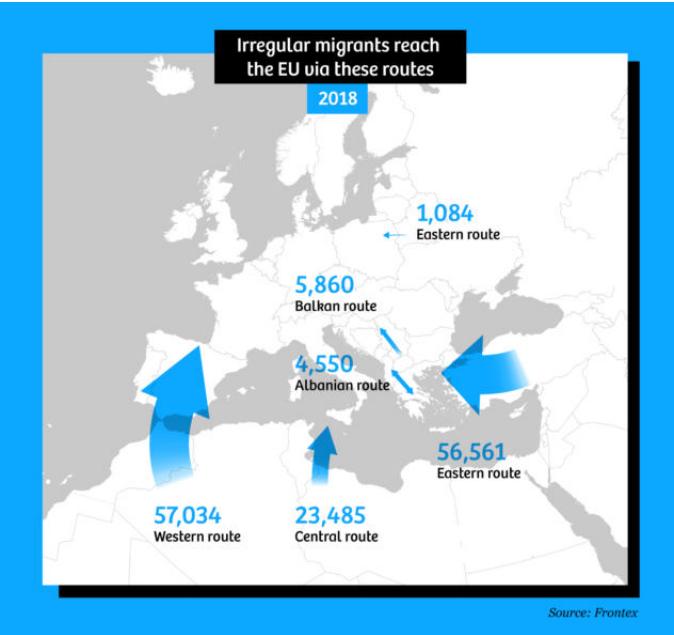
TONE





"How maps in the media make us more negative about migrants" by Maite Vermeulen, Leon de Korte & Henk van Houtum





"How maps in the media make us more negative about migrants" by Maite Vermeulen, Leon de Korte & Henk van Houtum



Audience (who)

- To whom are you communicating?
- What do they already know?
- What is your position and relationship?

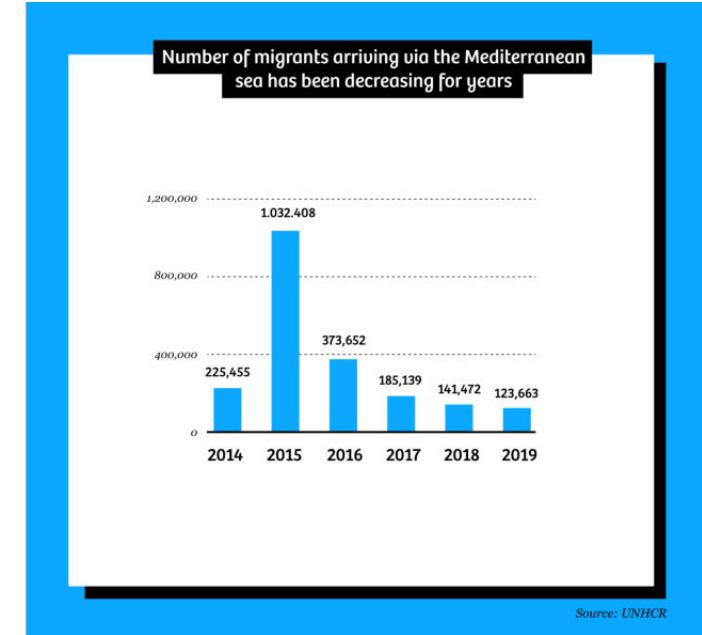
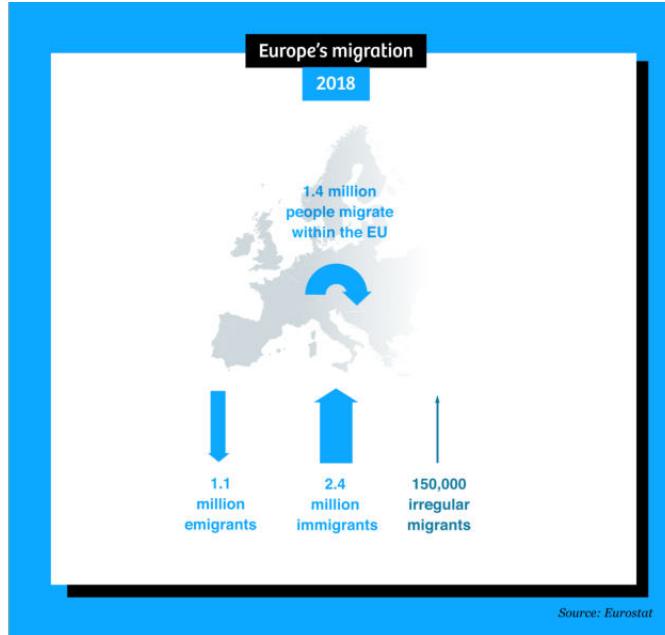
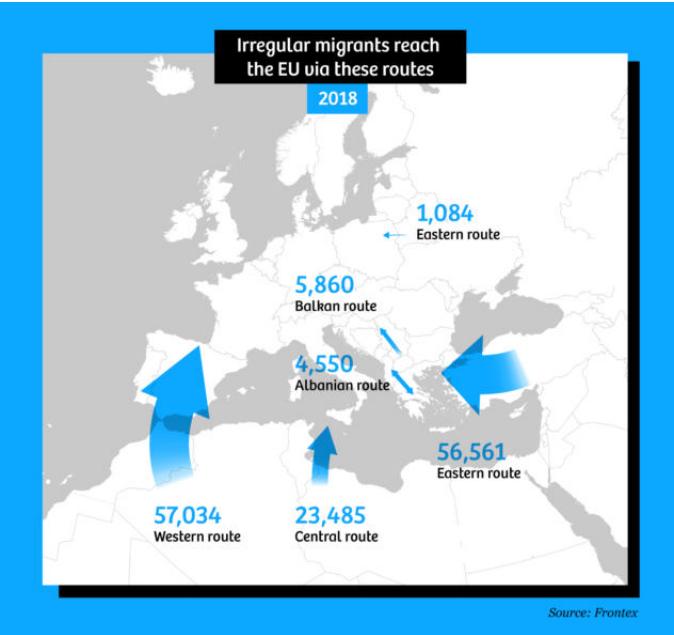
Content (what)

- What do you want them to know or do?
- How will you communicate with them?
- What tone do you want your communication to set?

Evidence (how)

- What data is available to make my point?





"How maps in the media make us more negative about migrants" by Maite Vermeulen, Leon de Korte & Henk van Houtum



Context: Prepare Yourself

- What is the one key message they should take home?
- What background information is essential? What's irrelevant?
- What are potential biases of (some of) the audience?
- What factors could weaken your case?
Can we address them proactively?



Exercises

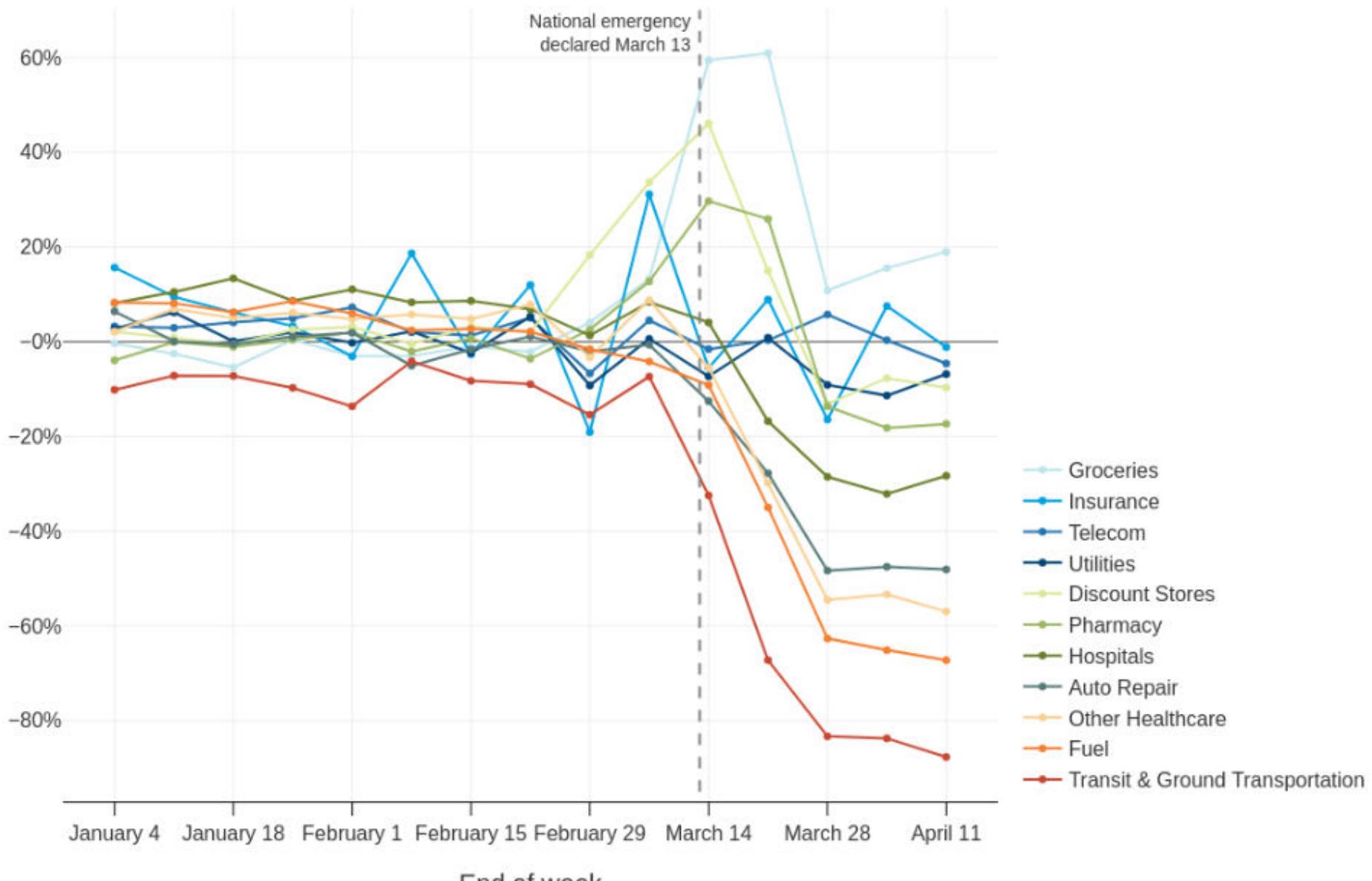


Exercise 1

- **Take a look at the following visualization of changes in spending before and after the National emergency.**
 - Dive into the data and find a narrative to focus on.
 - Draft a 3-minute story.
 - Boil it down to the “Big Idea”.



Year-over-year percent change in spending by essential category



Exercise 2

- **Apply the concepts to a data set you are currently working on.**
 - Write down the main message of your data.
 - List the audience, tone, and medium.
- **Now critically review your (or your colleagues) chart(s).**
 - What is one main message you would take home from the visualization?
 - Could the reader arrive at a different interpretation or comprehension?
 - Is the visualization suitable for your audience and communication medium?
 - Are the axis titles easy to understand? Is the title in line with the data shown?

