

# Some secrets of science communication

SCNAT Young Faculty Meeting  
Griesalp, 1st June 2023



**AGATA**

words.networks.strategy.creative stuff

We make complicated things easy

# Thanks!



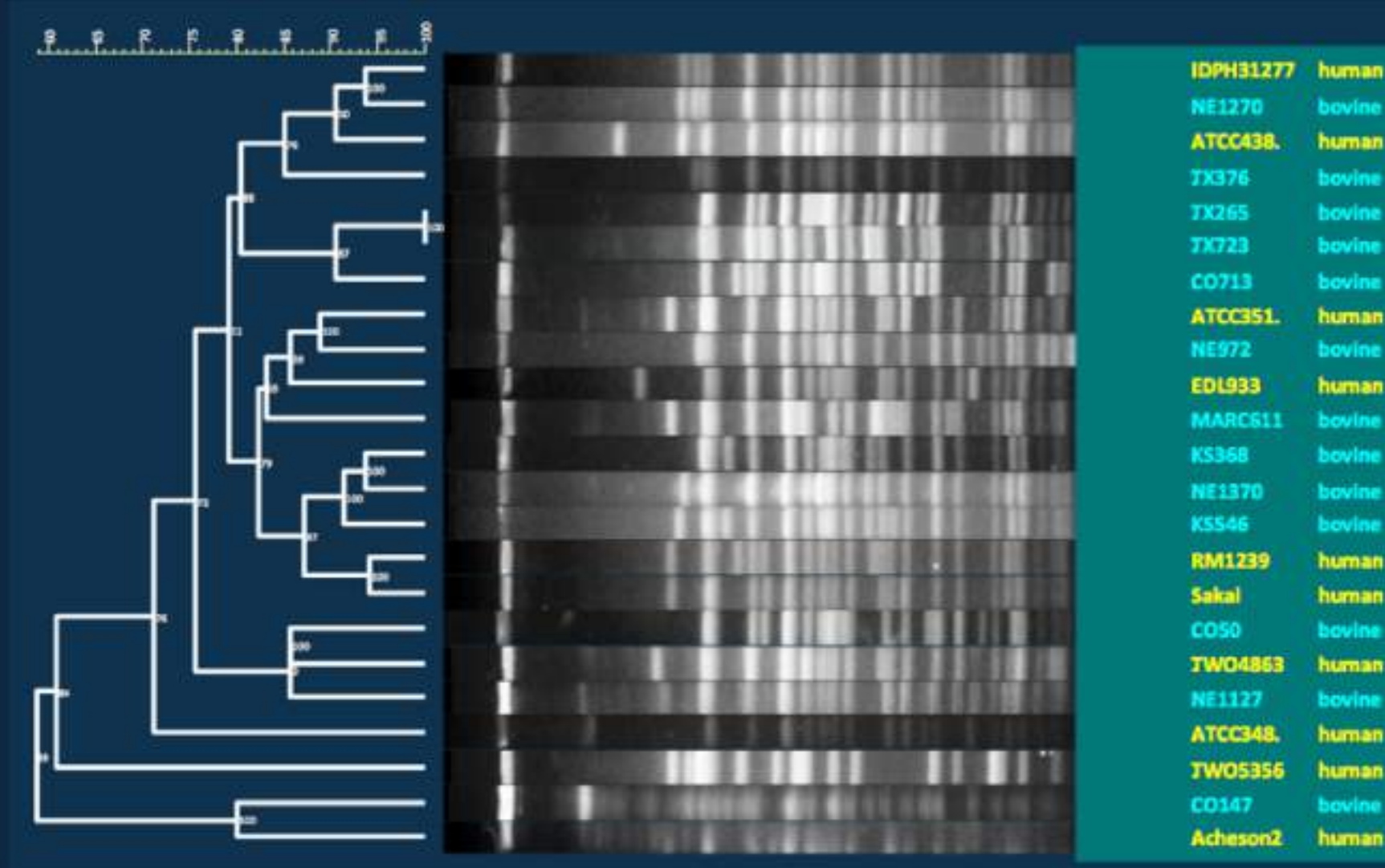
scnat  
swiss academy of sciences



# An example of PFGE versus SNP genotyping

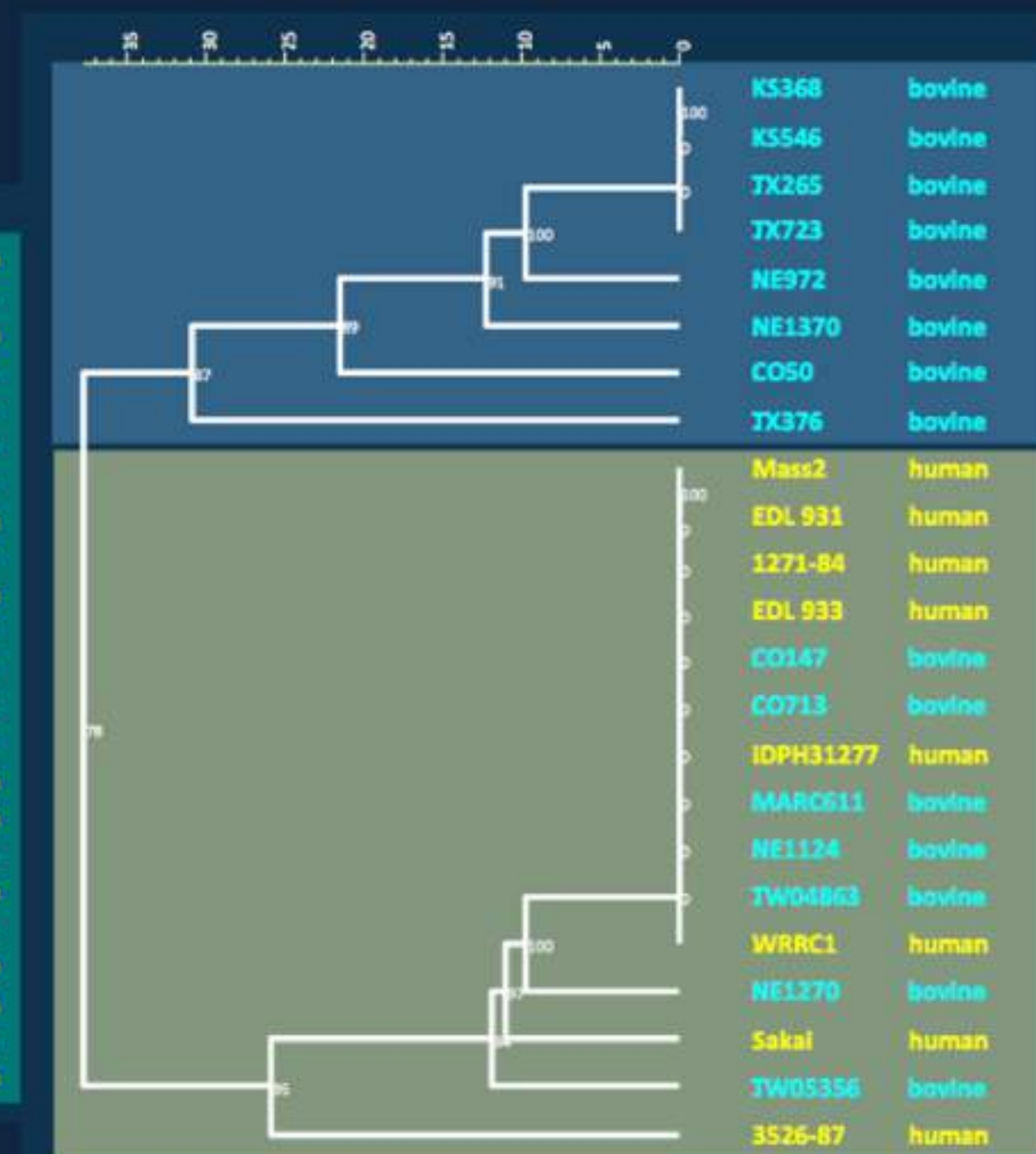
PFGE

Identity by state



SNP

Identity by decent



# What's Agata?

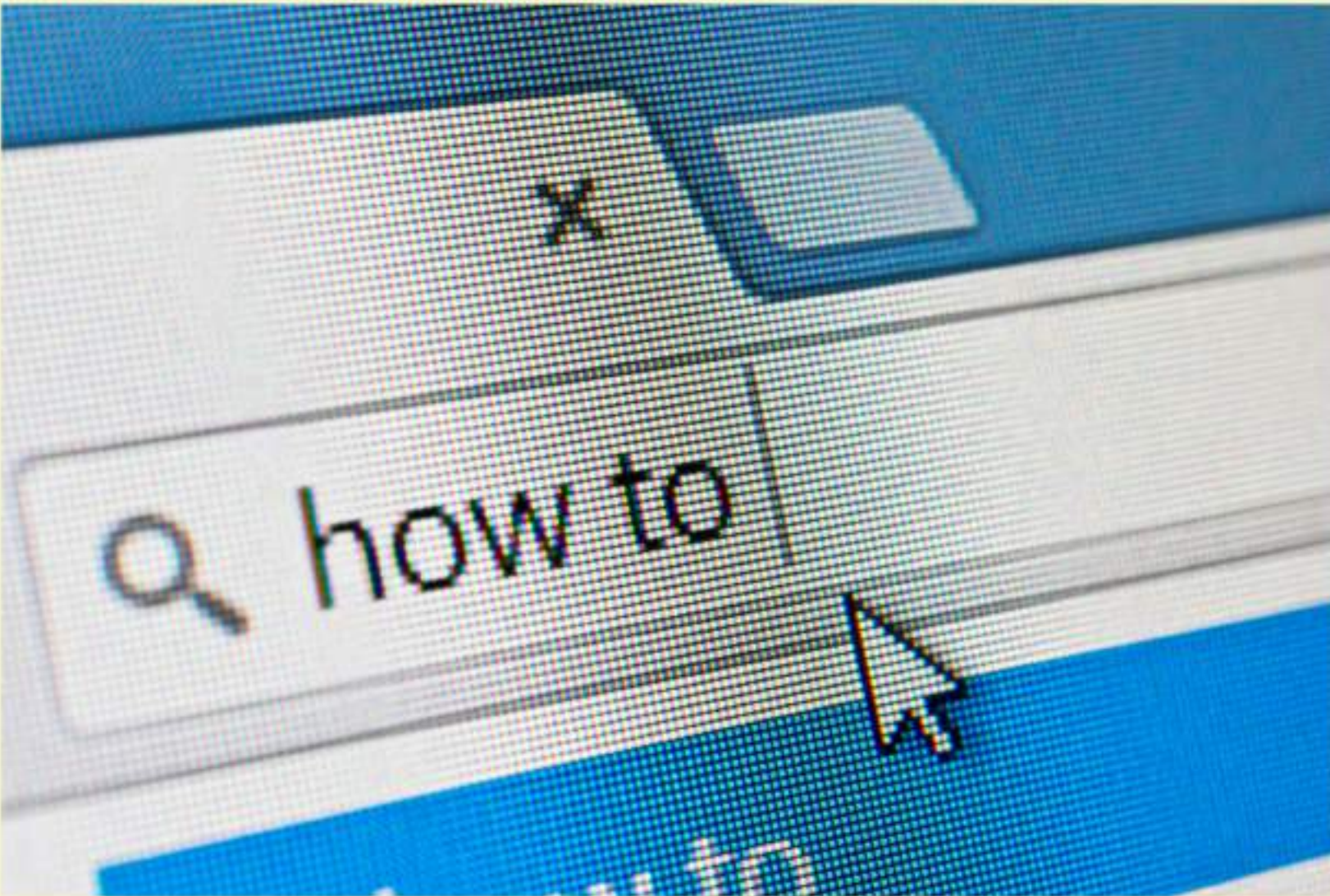


We make complicated things easy.

Our agency focuses on delivering science  
and innovation to the right audiences.



# What to expect



- Scicomm 101
- Storytelling in scicomm
- Planning sustainable outreach actions
- Tips & tricks for writing



# Scicomm isn't new



## DIALOGO DI GALILEO GALILEI LINCEO MATEMATICO SOPRAORDINARIO DELLO STUDIO DI PISA. *E Filosofo, e Matematico primario del* SERENISSIMO GR.DVCA DI TOSCANA.

*Doue ne i congressi di quattro giornate si discorre  
sopra i due*

MASSIMI SISTEMI DEL MONDO  
TOLEMAICO, E COPERNICANO;

*Proponendo indeterminatamente le ragioni Filosofiche, e Naturali  
tanto per l'una, quanto per l'altra parte.*

CON PRI



VILEGI.

IN FIRENZA, Per Gio:Batista Landini MDCXXXII.

CON LICENZA DE' SUPERIORI.

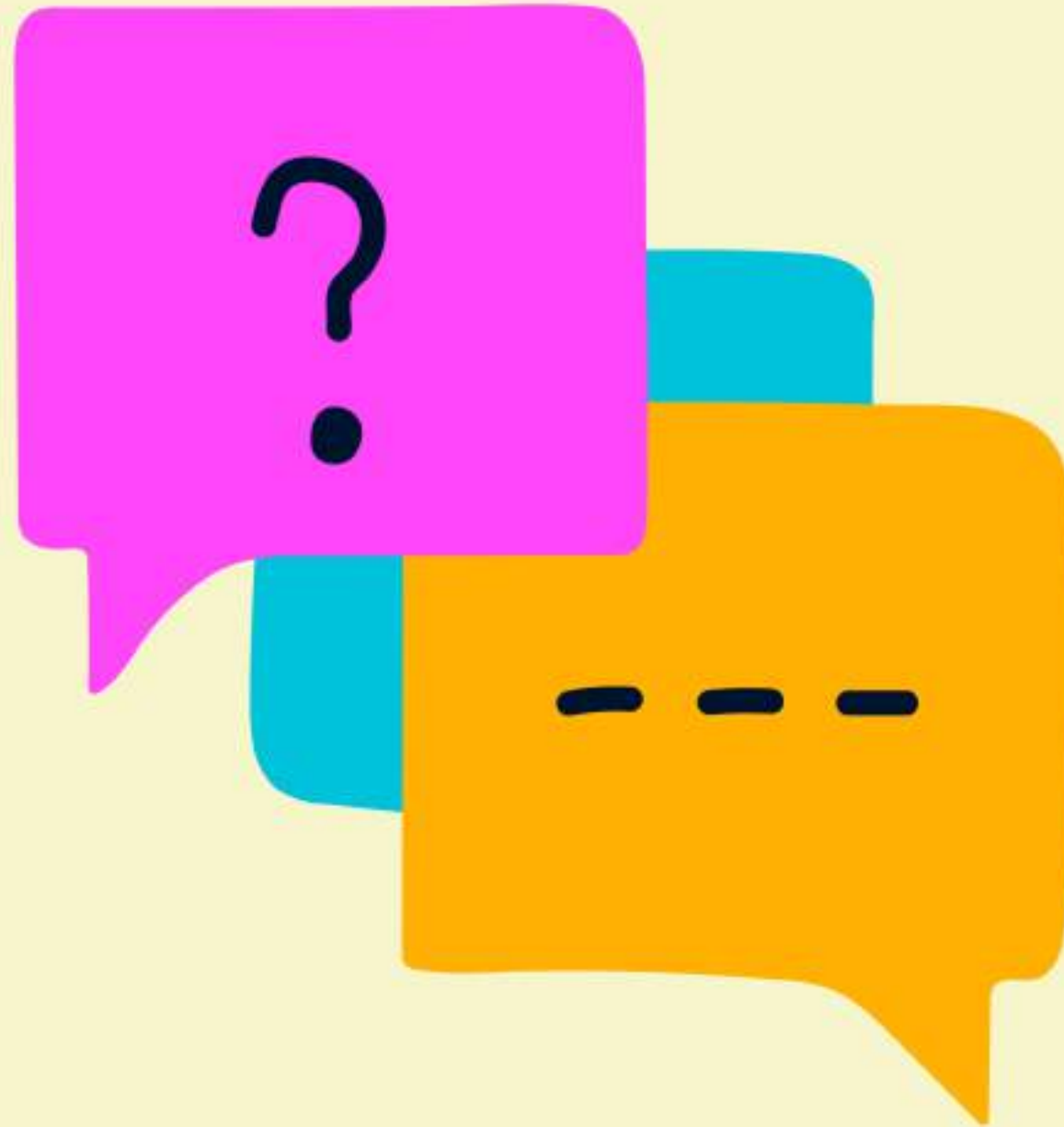
Italy, 1632



England, 1856



# What is scicomm?



# What is scicomm?



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# We make complicated things easy



Plus, things like:

- Public understanding
- Science journalism
- Science policy
- Press relations
- Psychological frameworks
- Education and outreach



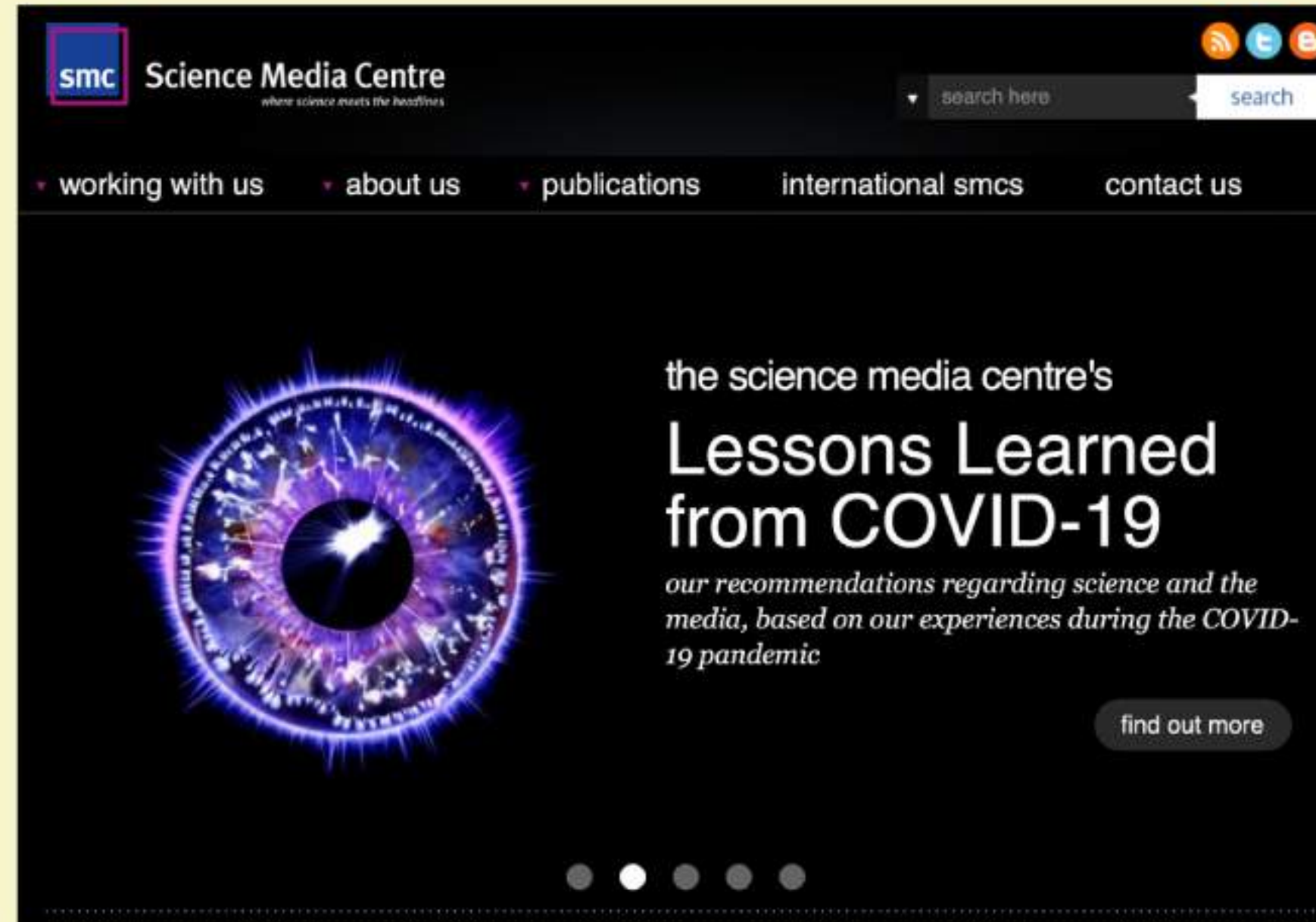
# Scicomm takes many forms



## Illustrated magazines



# Scicomm takes many forms




## Media and policy reports

# Scicomm takes many forms






### Recent Episodes




Oct 14, 2022

#### No-Touch Abortion

From surgery to pills, we look at how abortions have changed since the 1970s, and how they might still change.




 Listen  




Oct 7, 2022

#### The Theater of David Byrne's Mind

A rockstar and a neuroscientist walk onto a stage...




 Listen  



Sep 30, 2022

#### Playing God

When people are dying and you can only save some, how do you choose?

 Listen  

[All Episodes](#)

## Podcasts



# Scicomm takes many forms



# Emojis

Original tweet by Nicola Gaston



# Scicomm takes many forms



Accessible tours



# It works: importance & impact

NEJM is the academic journal with highest impact

When covered in the NYT, the papers get 73% more citations!

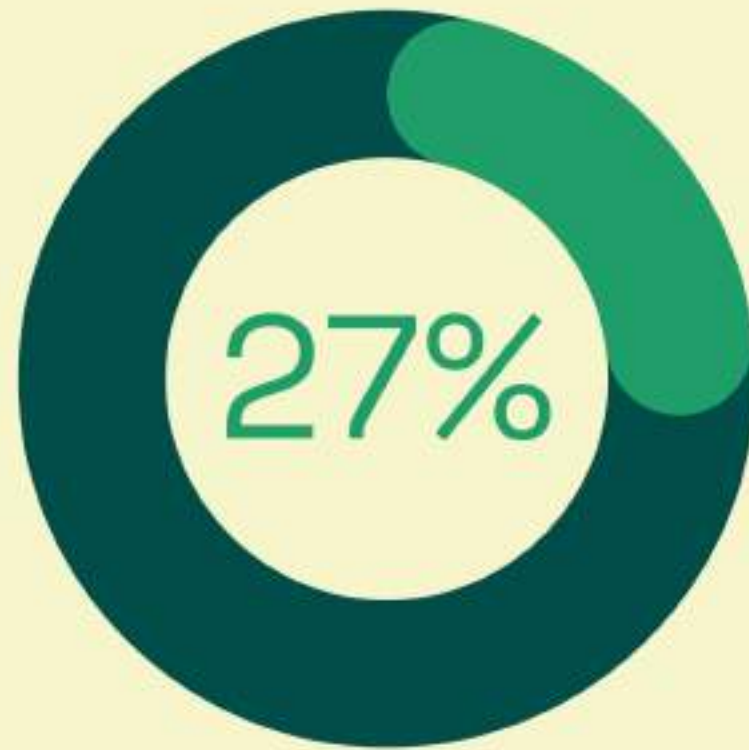


Philips, D.P. et al. NEJM, 1991, DOI: [10.1056/NEJM199110173251620](https://doi.org/10.1056/NEJM199110173251620).

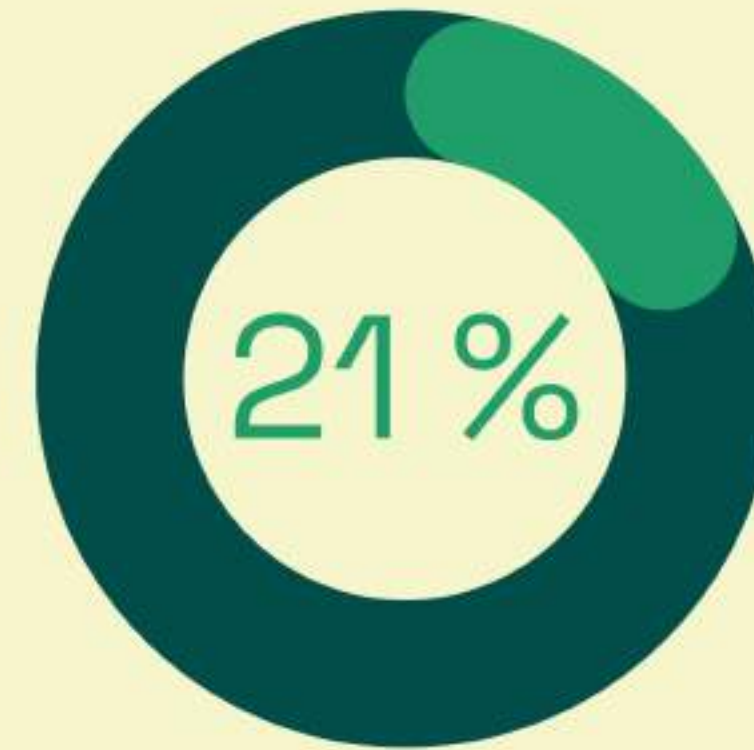
Fanelli, D. Scientometrics, 2013, DOI: [10.1007/s11192-012-0925-0](https://doi.org/10.1007/s11192-012-0925-0).



# Beyond (academic) impact



Uptick in conference  
invitations



Contacts by  
relevant companies

Alonso-Flores, F. & Moreno Castro, C. J. Educ. Soc. Pol. 2018, 5, 2, 34. DOI: 10.30845/jesp.v5n2p5.



# Beyond (academic) impact

## Requirements



Beneficiaries of Horizon Europe and Horizon 2020 funding must carry out activities to increase the impact of their project results:

- They must share research results with the scientific community, commercial players, civil society and policymakers ('dissemination').
- They must also take action to use their project results for commercial purposes, to tackle societal problems or in policymaking ('exploitation').

Dissemination and exploitation are a requirement as per your grant agreement, in addition to your communication activities. Check our [quick guide on communication, dissemination and exploitation](#)

EN | \*\*\*

## nature



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[nature](#) > [news](#) > article

[Published: 18 October 2017](#)

### Top Chinese university to consider social-media posts in researcher evaluations

[David Cyranoski](#)

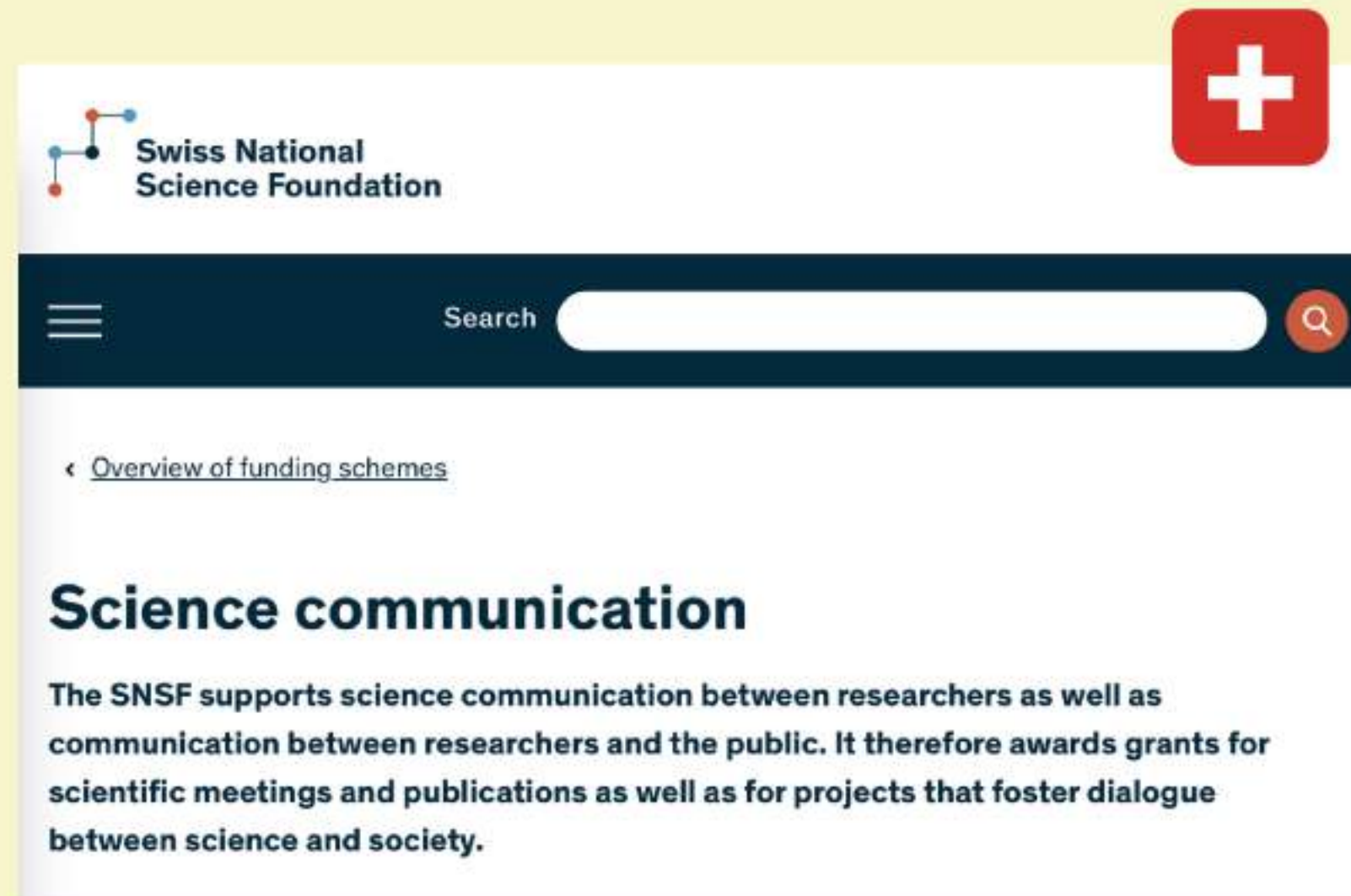
[Nature](#) (2017) | [Cite this article](#)

67 Accesses | 1 Citations | 192 Altmetric | [Metrics](#)

# Grants (everywhere) require scicomm



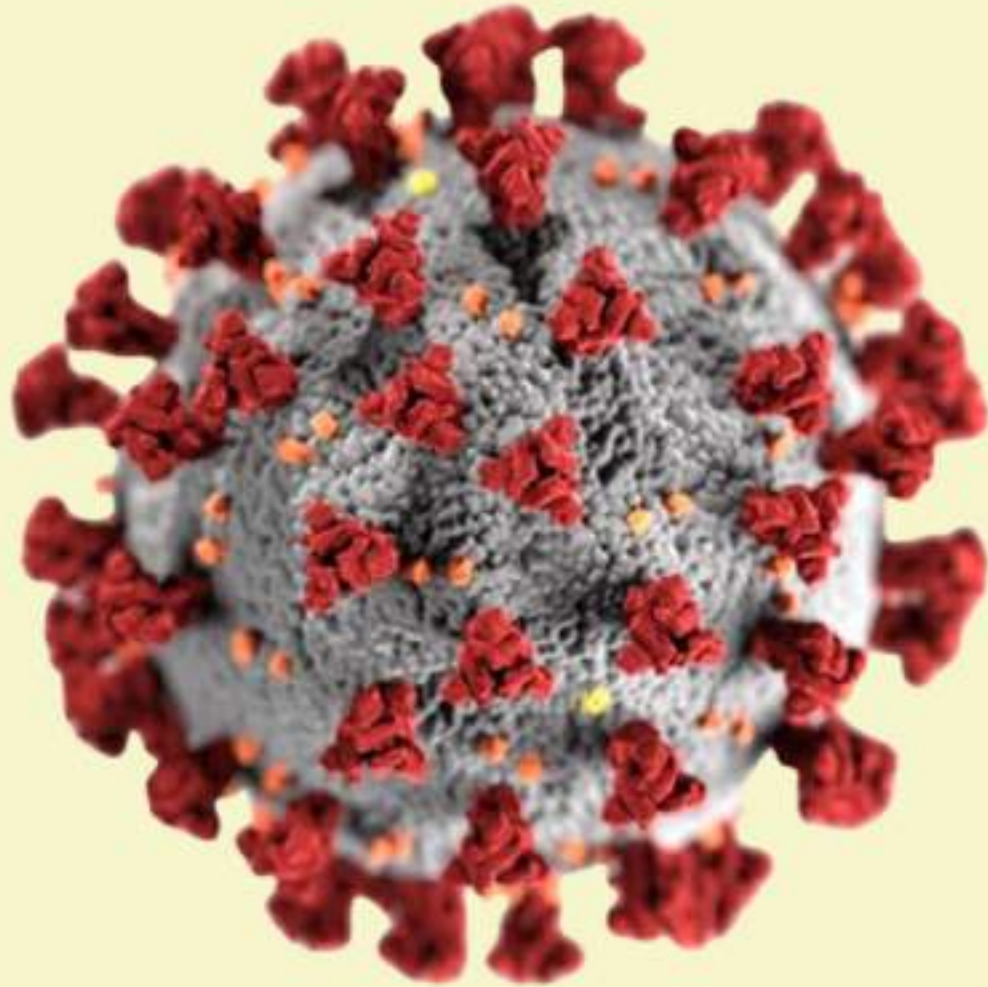
# Beyond (academic) impact



Grants (sometimes) support scicomm



# Beyond (academic) impact



COVID-19 has made evident how crucial it is to engage with everyone, including those uninterested in science, hard to reach, or members of vulnerable groups.





Grants PhDs

... and now comms?

Admin

Conferences

Classes





We're here to help



# Tips & tricks



Storytelling



Plan your actions



Writing tips

# Tips & tricks



Storytelling



Plan your actions



Writing tips

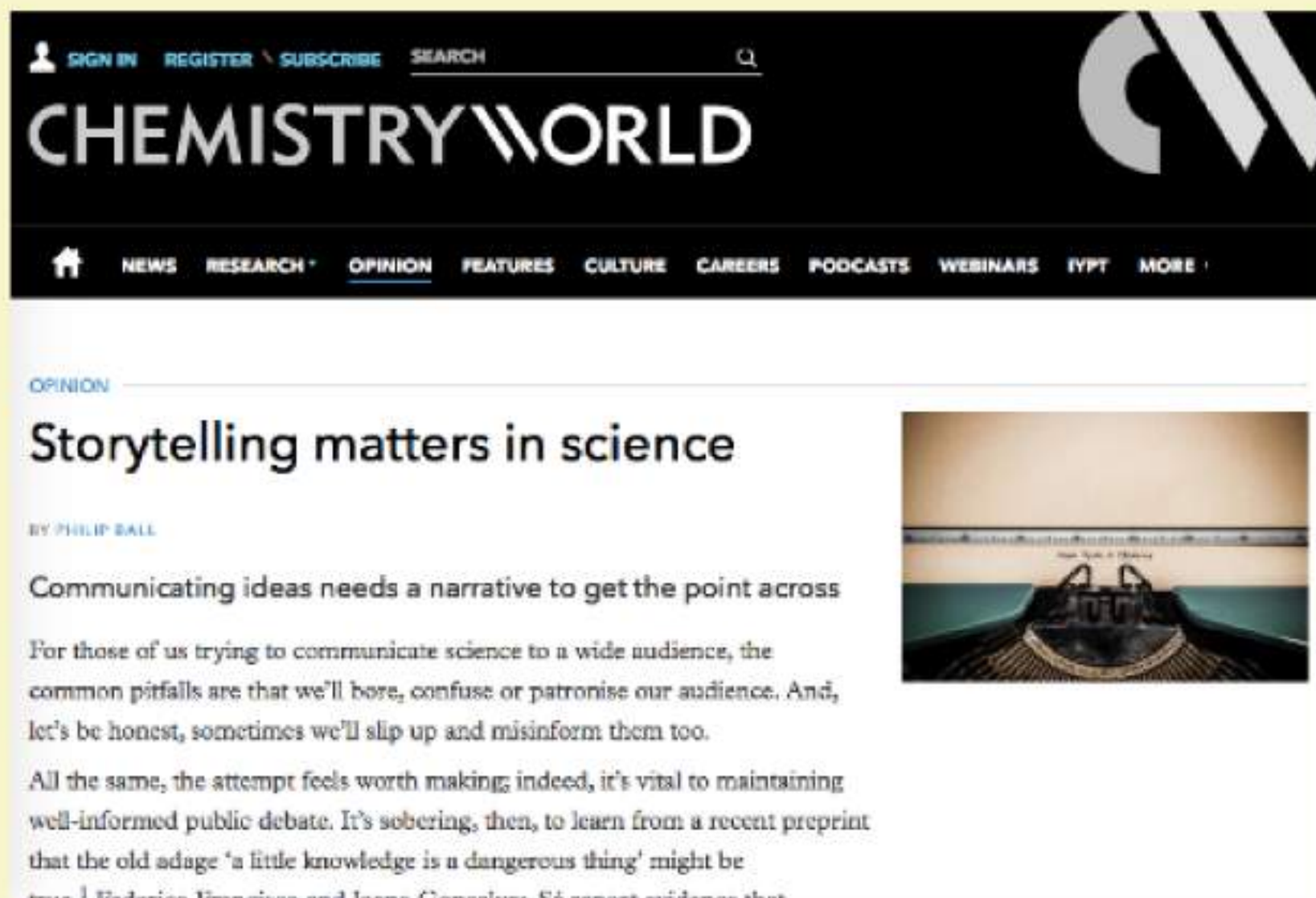


# It's all about stories



## A good story sticks

# It's all about stories



The tips and tricks:

- Find the narrative
- Never patronise
- Convince your audience
- Facts and numbers are often confusing

Every paper tells a story

Philip Ball: "Storytelling matters in science". Link: <http://bit.ly/2Xvts3H>



# Every paper tells a story

Issue 18, 2022



From the journal:  
**Chemical Science**

[Previous Article](#)

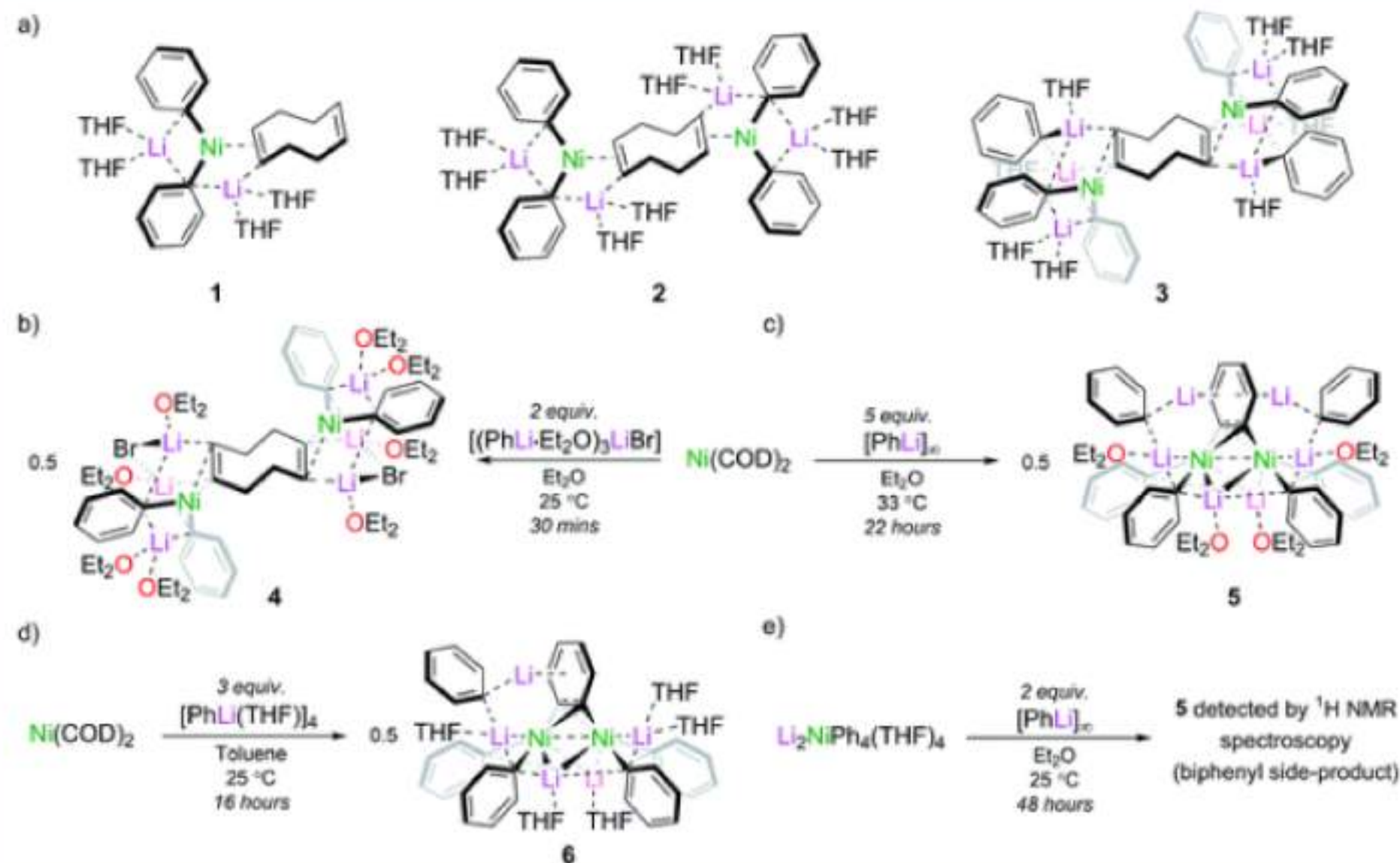
[Next Article](#)

## Unmasking the constitution and bonding of the proposed lithium nickelate “ $\text{Li}_3\text{NiPh}_3(\text{solv})_3$ ”: revealing the hidden $\text{C}_6\text{H}_4$ ligand†



Rosie J. Somerville, <sup>†a</sup> Andryj M. Borys, <sup>†b</sup> Marina Perez-Jimenez, <sup>a</sup> Ainara Nova, <sup>c</sup>  
David Balcells, <sup>c</sup> Lorraine A. Malaspina, <sup>b</sup> Simon Grabowsky, <sup>b</sup> Ernesto Carmona, <sup>a</sup>  
Eva Hevia <sup>\*b</sup> and Jesús Campos <sup>\*a</sup>

Author affiliations



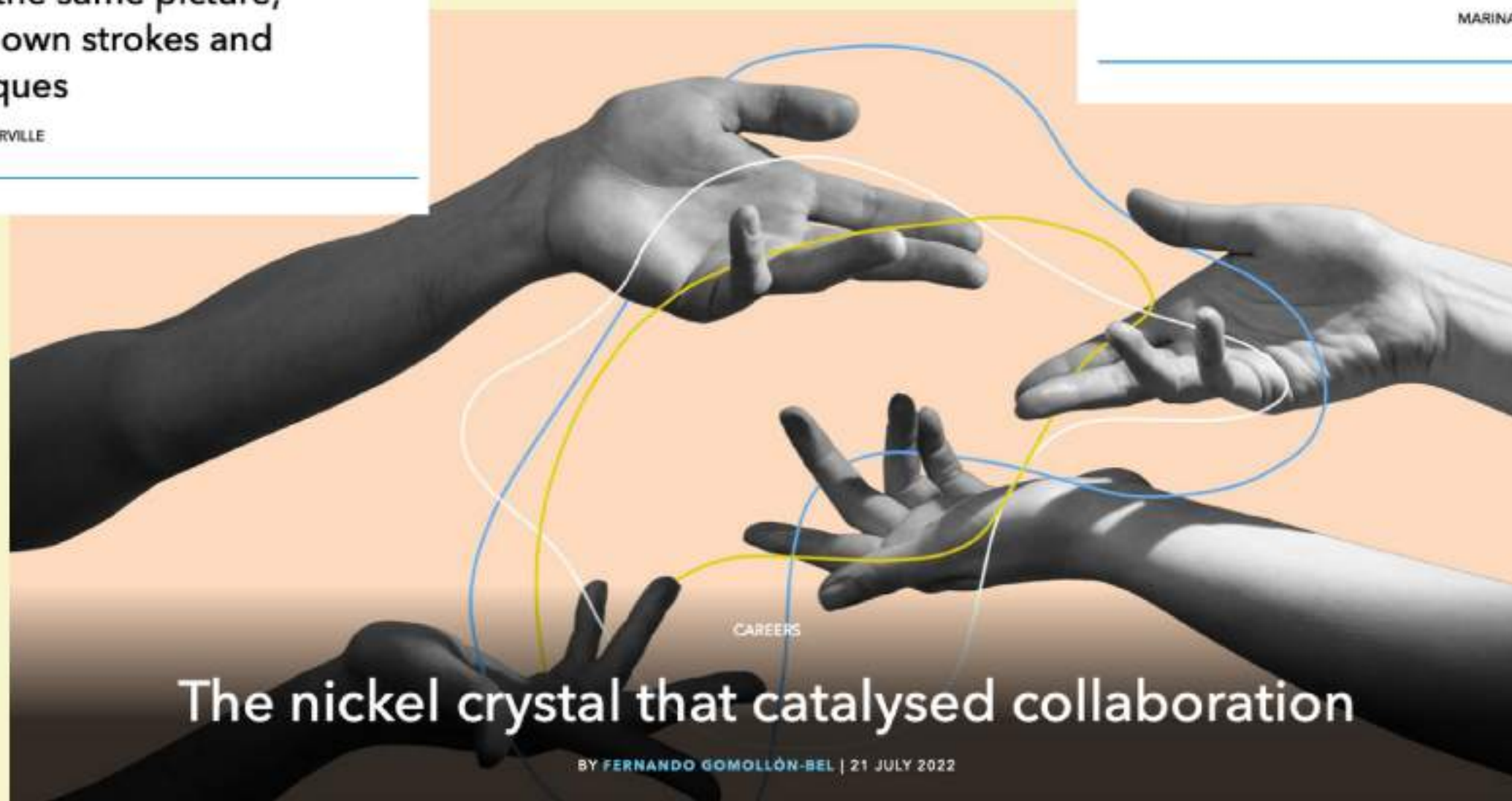
# Every paper tells a story

It was like painting the same picture,  
but each using our own strokes and  
techniques

ROSIE SOMERVILLE

We've now established a new network,  
something fundamental in science

MARINA PÉREZ-JIMÉNEZ



F. Gomollón Bel: "The nickel crystal that catalysed collaboration." Link: <https://bit.ly/3zdARt3>



# Every paper tells a story

## Species conflict at Earth's edges – Contests, climate, and coveted resources

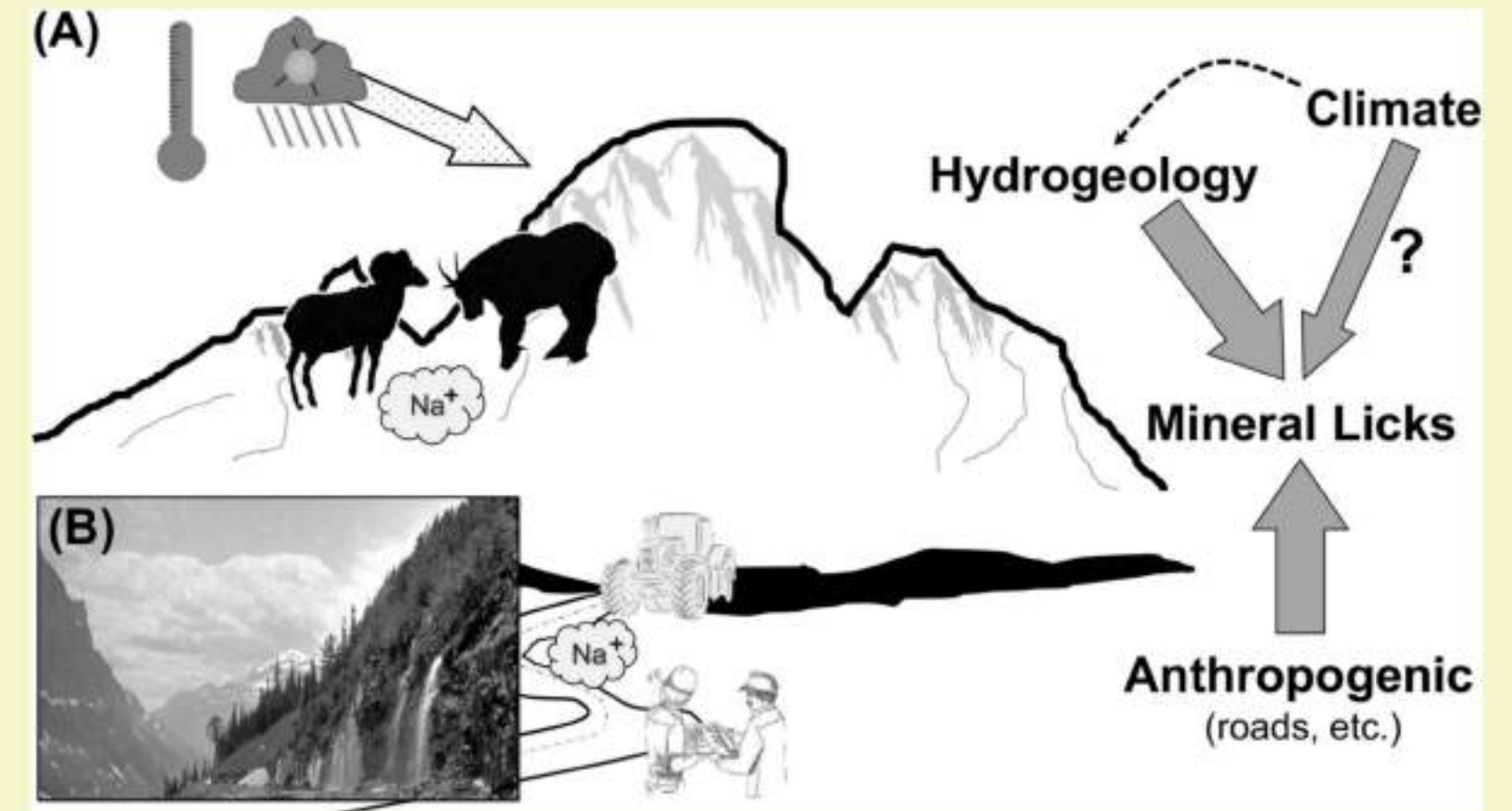
Joel Berger<sup>1,2\*</sup>, Mark Biel<sup>3</sup> and Forest P. Hayes<sup>1</sup>

<sup>1</sup> Department of Fish, Wildlife, and Conservation Biology, Colorado State University, Fort Collins, CO, United States

<sup>2</sup> Wildlife Conservation Society–Global Program, The Bronx, NY, United States

<sup>3</sup> Glacier National Park, West Glacier, MT, United States

Direct conflict between species is an infrequently witnessed biological phenomenon. Potential drivers of such contests can include climate change, especially at Earth's high elevation and latitudinal extremes where temperatures warm 2–5 times faster than elsewhere and hydro-geomorphic processes such as glacial recession and soil erosion affect species access to abiotic resources. We addressed a component of this broader issue by empirical assessments of mammalian conflict over access to four abiotic resources – minerals, water, snow, and shade – by annotation of past studies and by empirical data collection. Evidence for Nearctic and Palearctic mammals indicates that when desert waters are in short supply, contests intensify, generally favoring larger species regardless of their status as native or exotic. Our empirical data indicate that contests between two large and approximately similarly-sized mammals – mountain goats (*Oreamnos americanus*) and bighorn sheep (*Ovis canadensis*) – along a 2,500 km gradient at three high-altitude (above tree-line) sites in the Rocky Mountains of North America, result in striking asymmetries: goats dominated > 95% of interactions. Despite far fewer observations of encounters to access shade or snow patches, an increasingly prominent dialog needs to be held about rarely explored biological phenomena where less is known than we might otherwise presume, whether induced by climate or increasing anthropological alteration because of underpinnings to understand community structure and conservation planning. Observations on the frequency and intensity by which individuals escalate behavior to access abiotic resources remains an underappreciated arena to help identify the proximate importance of scarcity in the natural environment. Notwithstanding



Front. Ecol. Evol., 17 October 2022. Sec. Conservation and Restoration Ecology. DOI: 10.3389/fevo.2022.991714



# Every paper tells a story



Mountain goats do not just like to lick salt; they crave it. The goats are known to travel as many as 15 miles in search of natural salt deposits to slurp up sodium and other essential nutrients not included in their regular diet. Mountain goats go so hard for sodium that they will tongue a rock or plant recently drenched in the salty urine of a human tourist.

But goats are not the only animals questing for salt at high altitudes in the United States. Another ungulate, the bighorn sheep, roams the same mountains in search of the same salt. Melting glaciers continue to expose more of these precious mineral deposits, altering the abundance and distribution of coveted resources for survival. In Glacier National Park in Montana, the bighorn sheep and mountain goats compete for access to these deposits. Yet despite the species' similar size, the mountain goats always come out on top, according to a new paper published Monday in the journal *Frontiers of Ecology and Evolution*. One could say their analysis proved the mountain goat remained the goat.

Sabrina Imbler: "Mountain Goats Keep Winning". Link: [bit.ly/3zbknBN](https://bit.ly/3zbknBN)



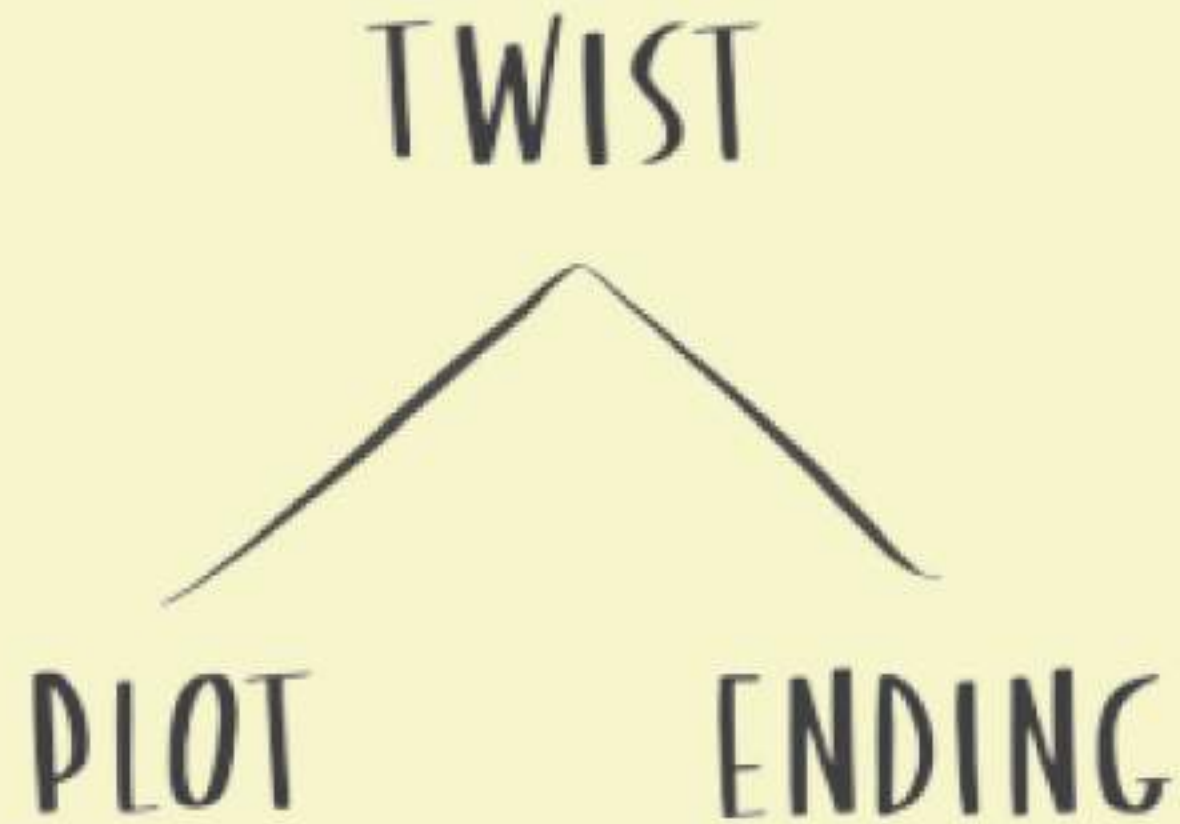
# We know how stories work

BEGINNING → MIDDLE → END

Aristotle knew this already!

C. Knafllic: "Storytelling with data". Link: <https://bit.ly/3yDPwgR>

# We know how stories work

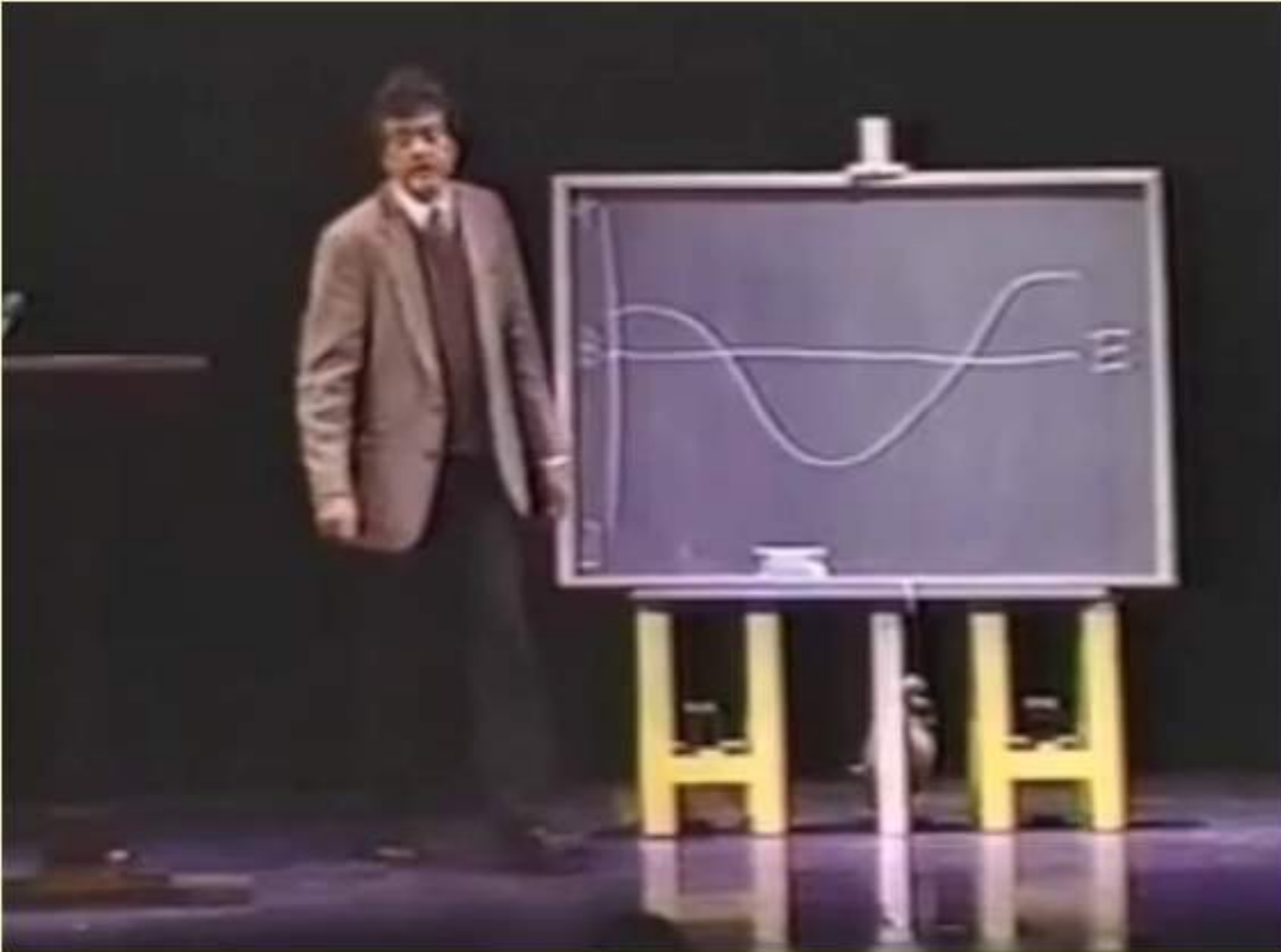


Aristotle knew this already!

C. Knafllic: "Storytelling with data". Link: <https://bit.ly/3yDPwgR>



# The "arcs" of storytelling



Kurt Vonnegut wrote his PhD dissertation on the shape of stories. Full lecture [here](#).



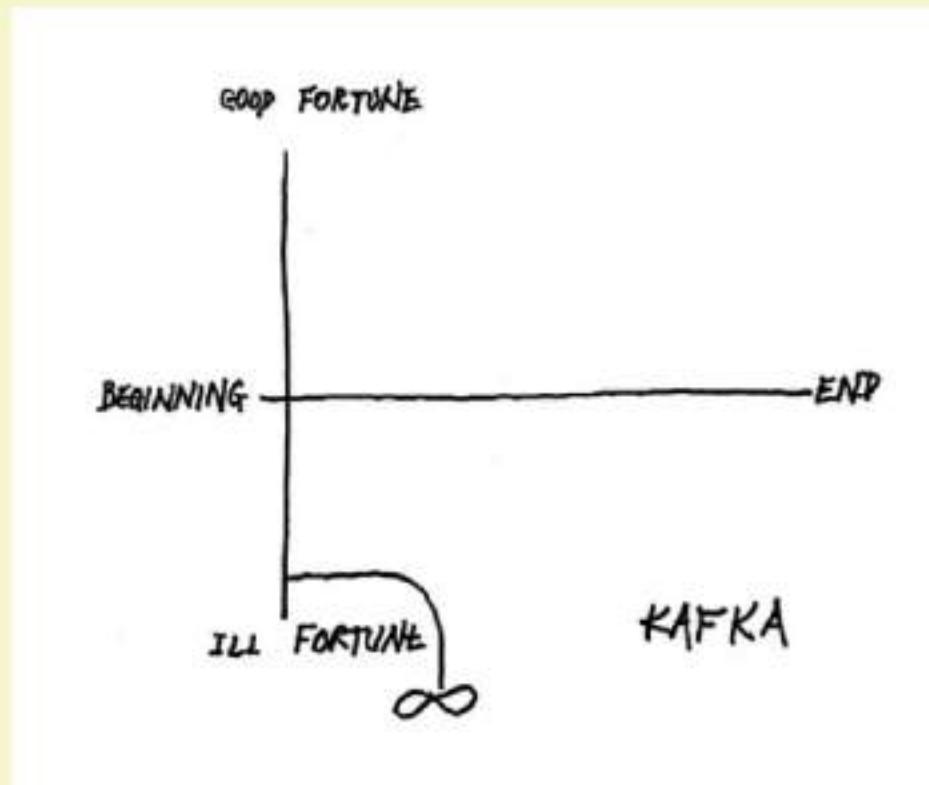
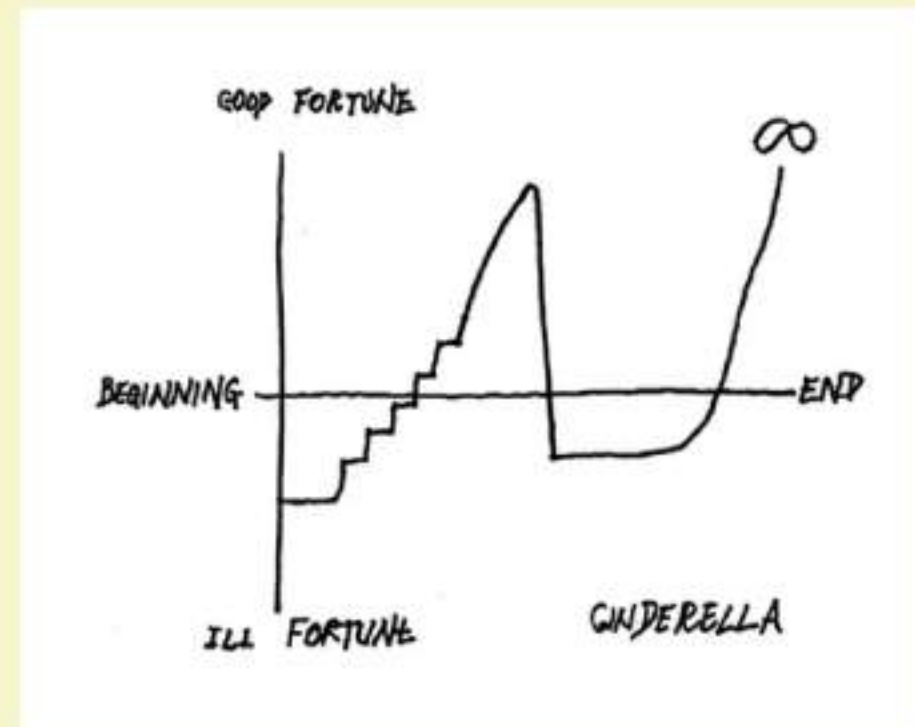
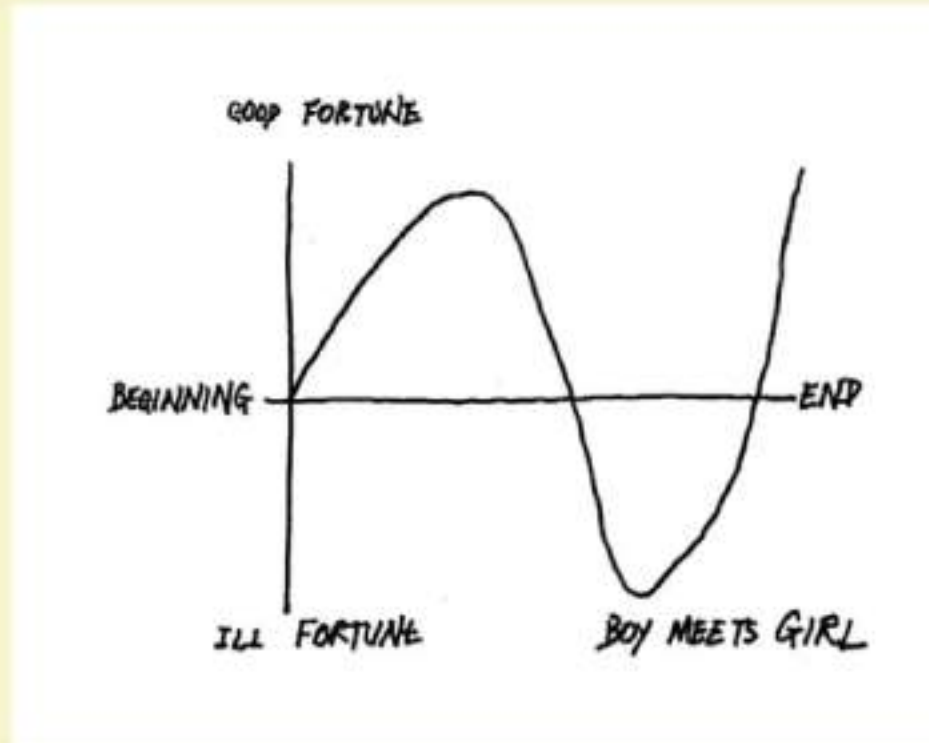
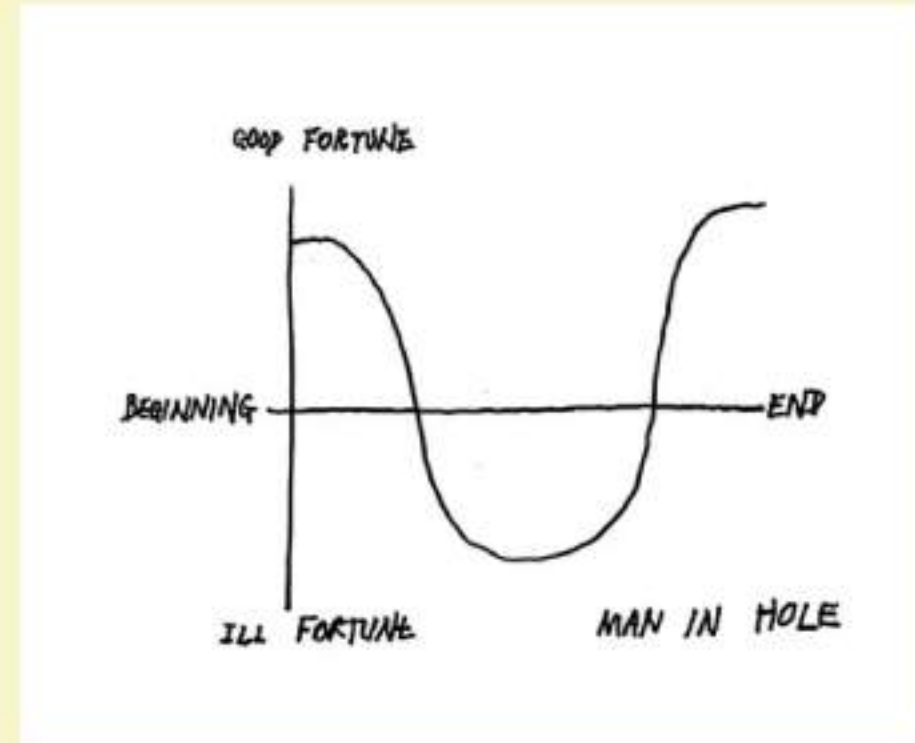
## An A.I. Says There Are Six Main Kinds of Stories

A machine mapped the most frequently used emotional trajectories in fiction, and compared them with the ones readers like best.

 The Atlantic / Nov 1, 2018

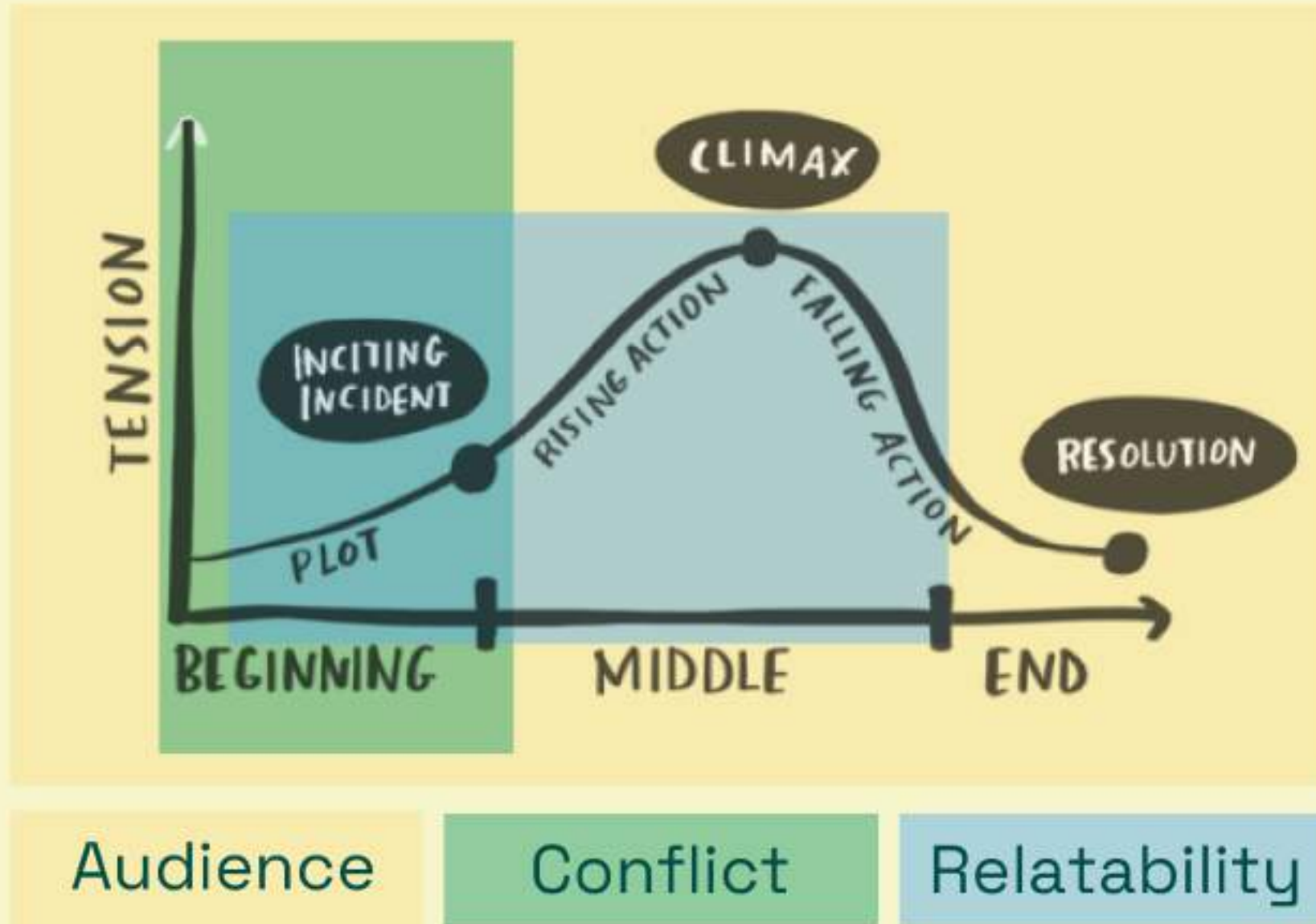
A. LaFrance: "[The Six Main Arcs in Storytelling, as Identified by an A.I.](#)". The Atlantic, 12/07/2016.

# The "arcs" of storytelling





# How to start the story



- Think about your audience.
- What is the conflict in the story? Your motivation to research on this and not other field.
- What part of your research is more relatable? Find hooks to current events.

# The ABT theory



And

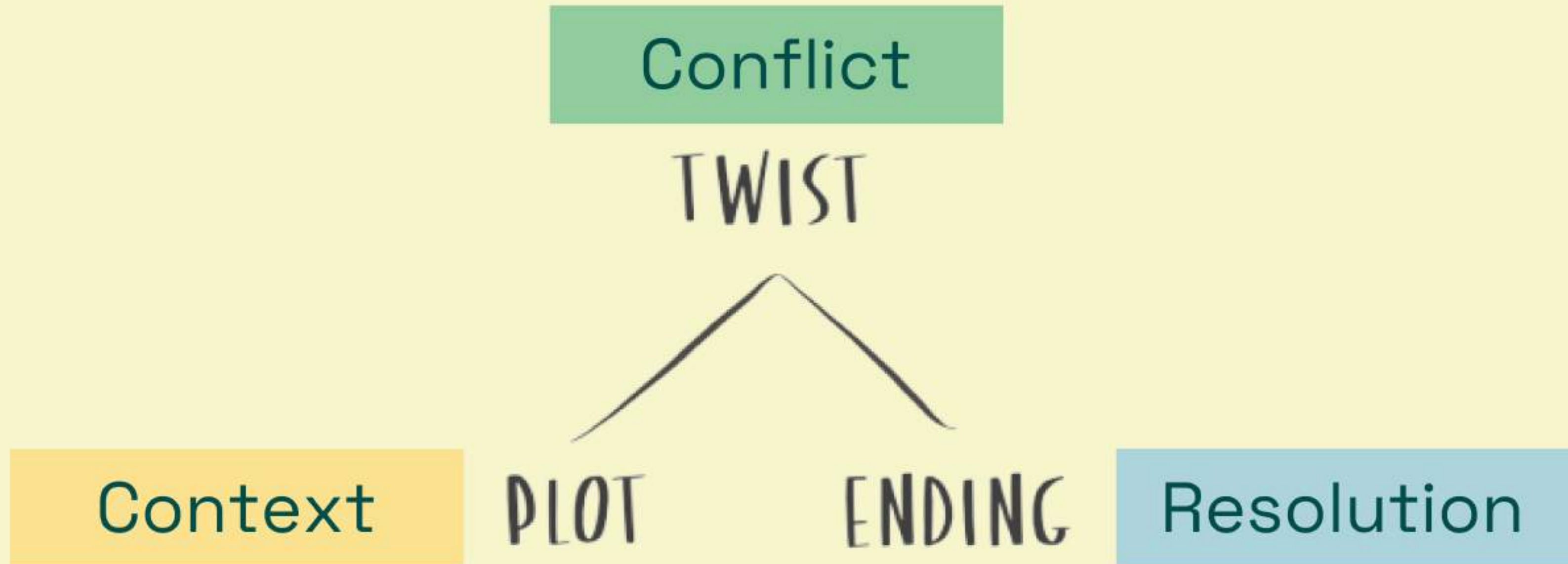
And

And

An



# The ABT theory



# The ABT theory

MOFs are great materials to adsorb stuff.

And

But they're often unstable and hard to upscale.

But

Thus, we made a new MOF that solves these problems.

Therefore



# The process

## Make a first outline

## Identify the key points

Write drunk,  
edit sober

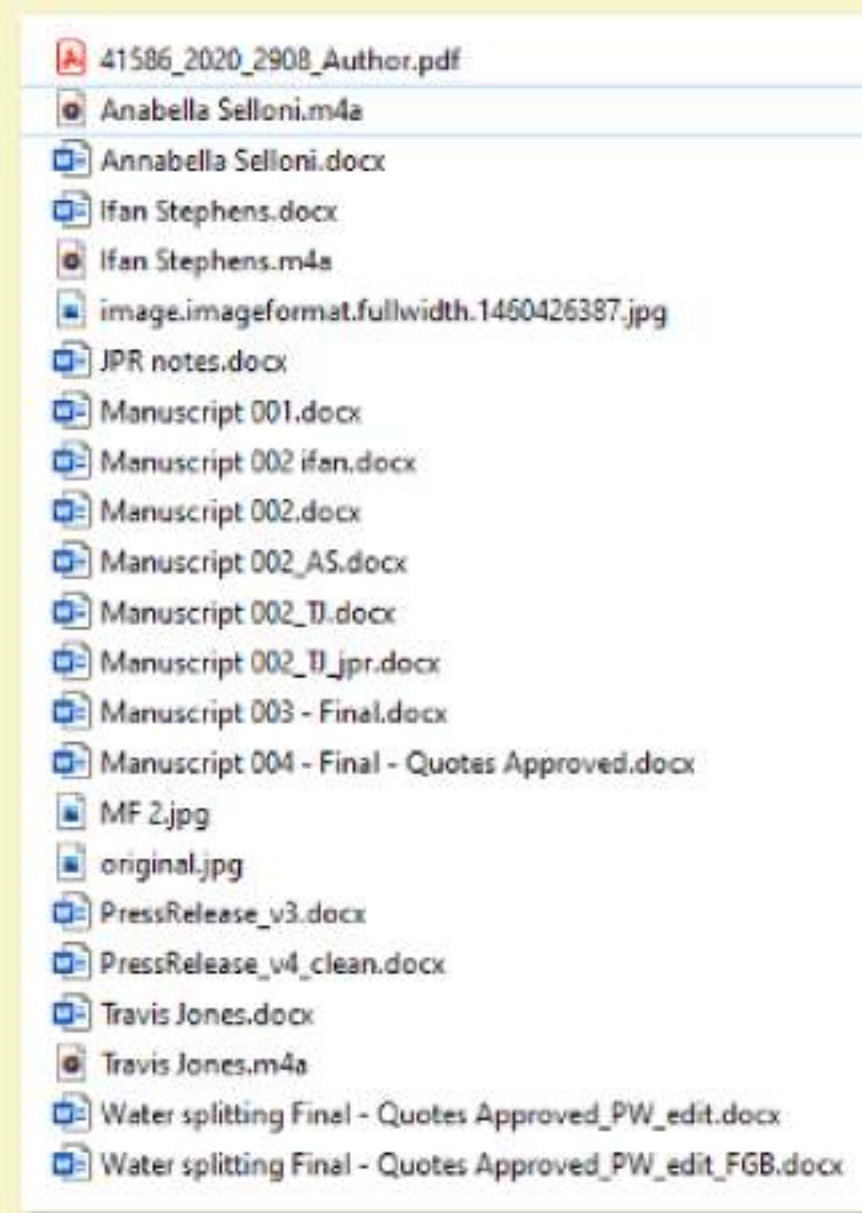
Any conflicts of interest?

Read your text  
out loud

Talk to colleagues  
and experts

## The secrets of scicomm

[www.agata.agency](http://www.agata.agency)



# The process

Identify the key points

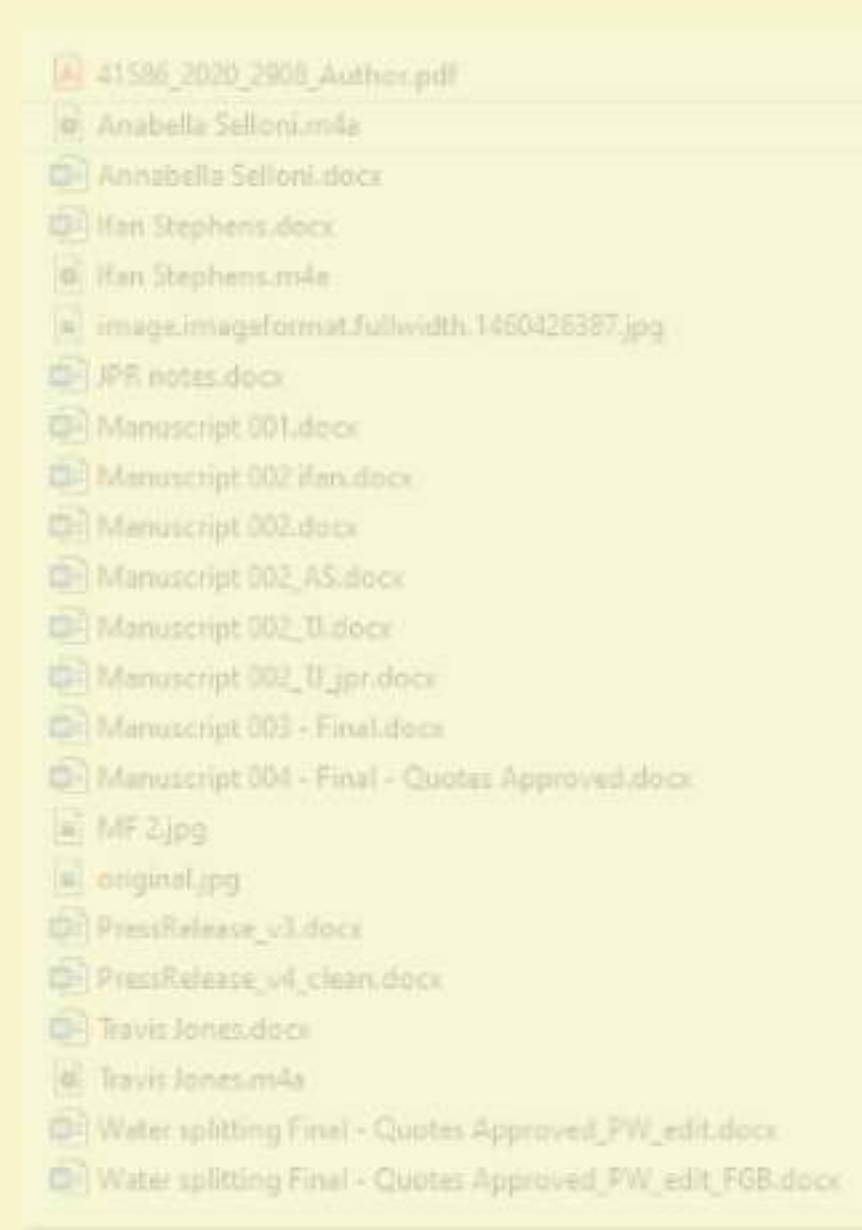
Write drunk,  
edit sober

Make a first outline

Any conflicts of interest?

Read your text  
out loud

Talk to colleagues  
and experts





# Use technology

This sentence has five words. Here are five more words. Five-word sentences are fine. But several together become monotonous. Listen to what is happening. The writing is getting boring. The sound of it drones. It's like a stuck record. The ear demands some variety.

Now listen. I vary the sentence length, and I create music. Music. The writing sings. It has a pleasant rhythm, a lilt, a harmony. I use short sentences. And I use sentences of medium length. And sometimes when I am certain the reader is rested, I will engage him with a sentence of considerable length, a sentence that burns with energy and builds with all the impetus of a crescendo, the roll of the drums, the crash of the cymbals--sounds that say listen to this, it is important.

So write with a combination of short, medium, and long sentences. Create a sound that pleases the reader's ear. Don't just write words. Write music.

Source: [hemingwayapp.com](http://hemingwayapp.com)

# What's an interesting story?



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# Frame your story

Find "hooks" that  
connect with your  
audience



Personal anecdotes  
& day-to-day stuff  
always works

Keep in touch with current  
events, stories that people  
really care about.

# Tips & tricks



Storytelling



Plan your actions

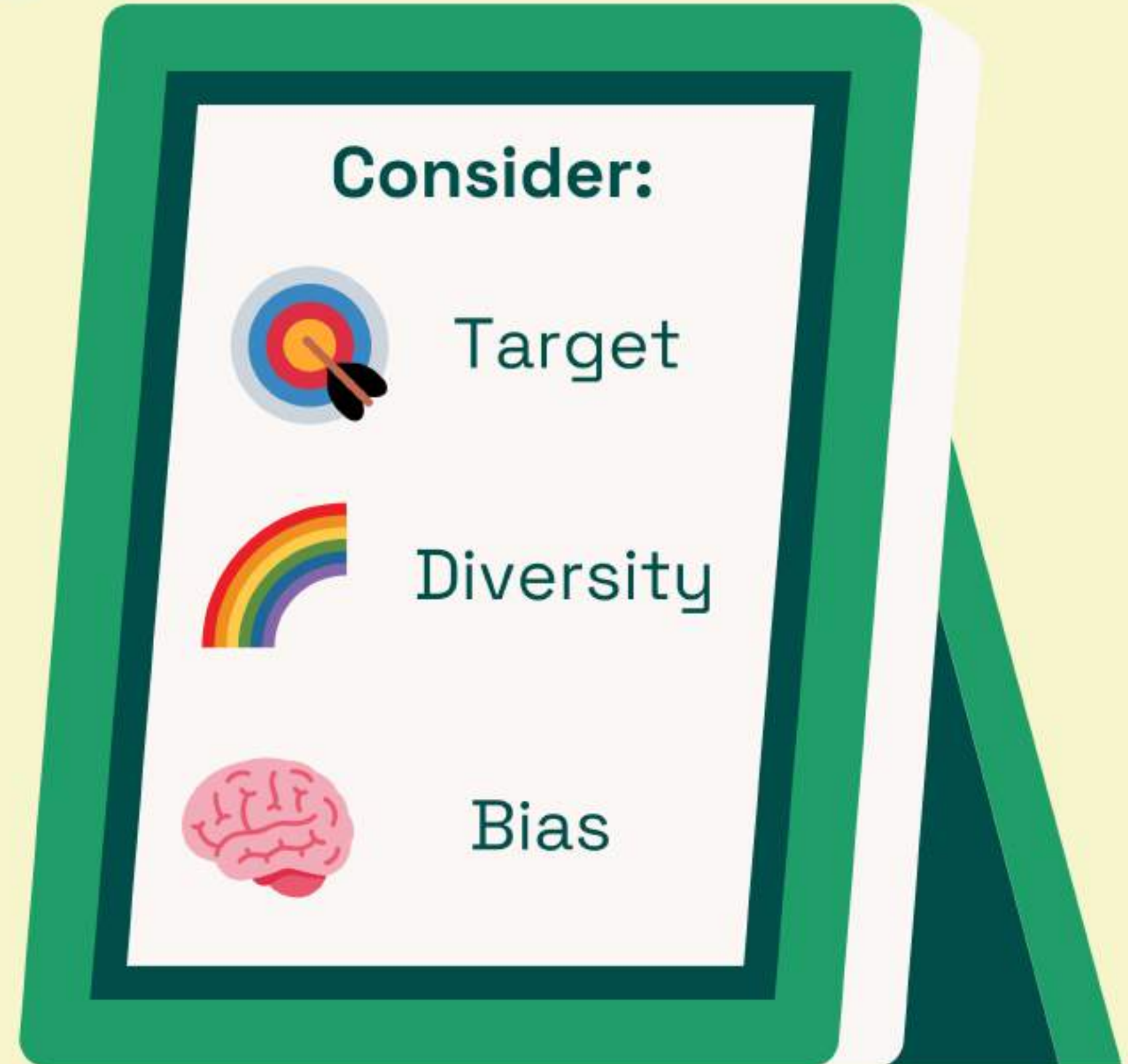


Writing tips

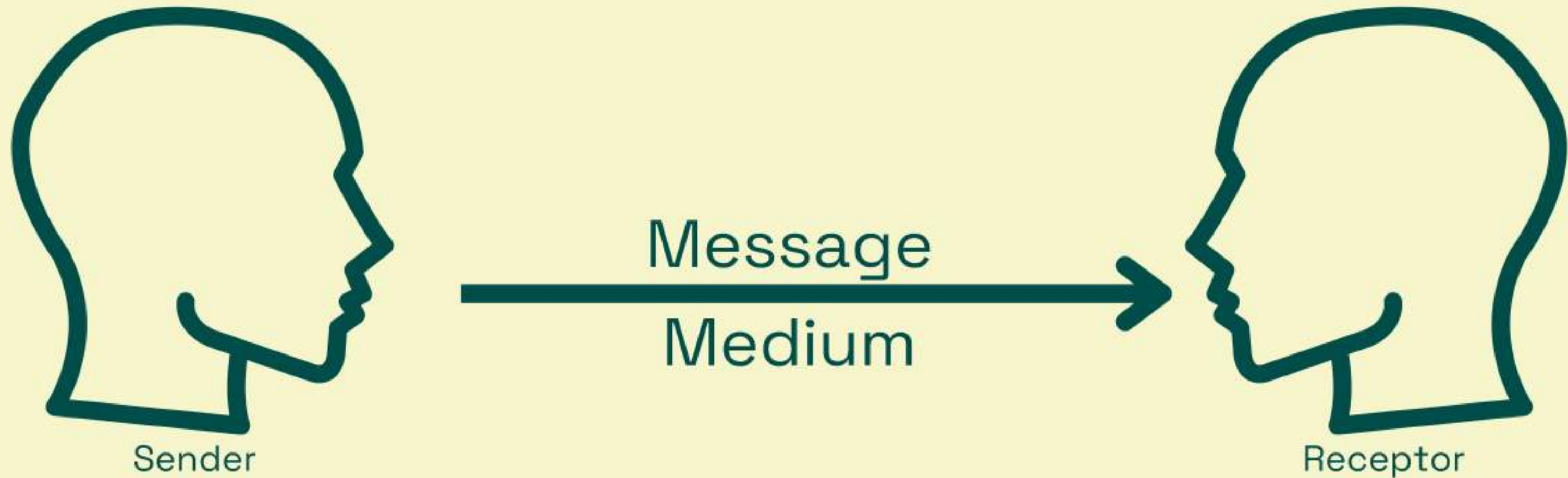


# Know your audience

People's pre-conceptions and biases must inform the message and actions



# How we usually think communication works



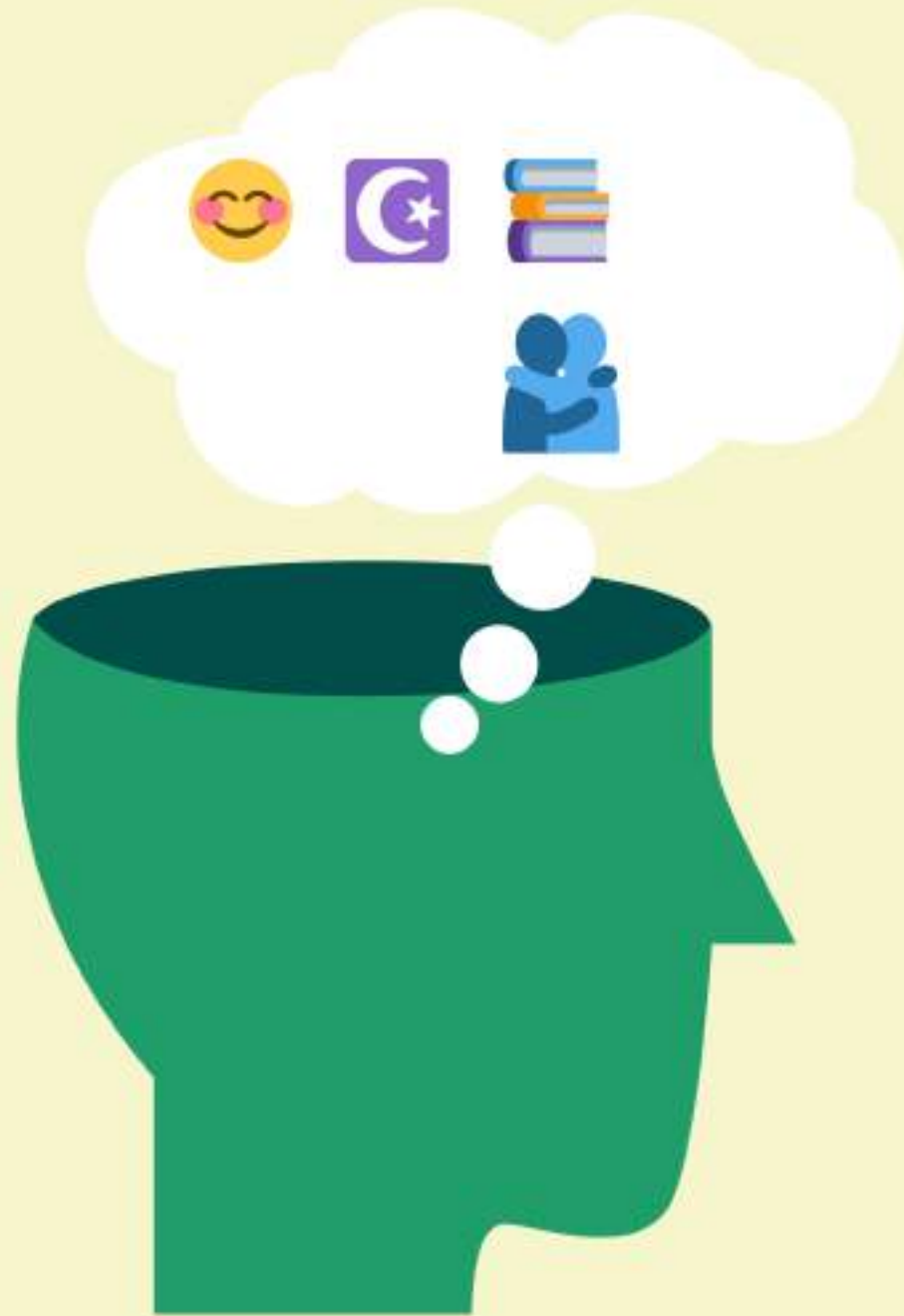


# Deficit model

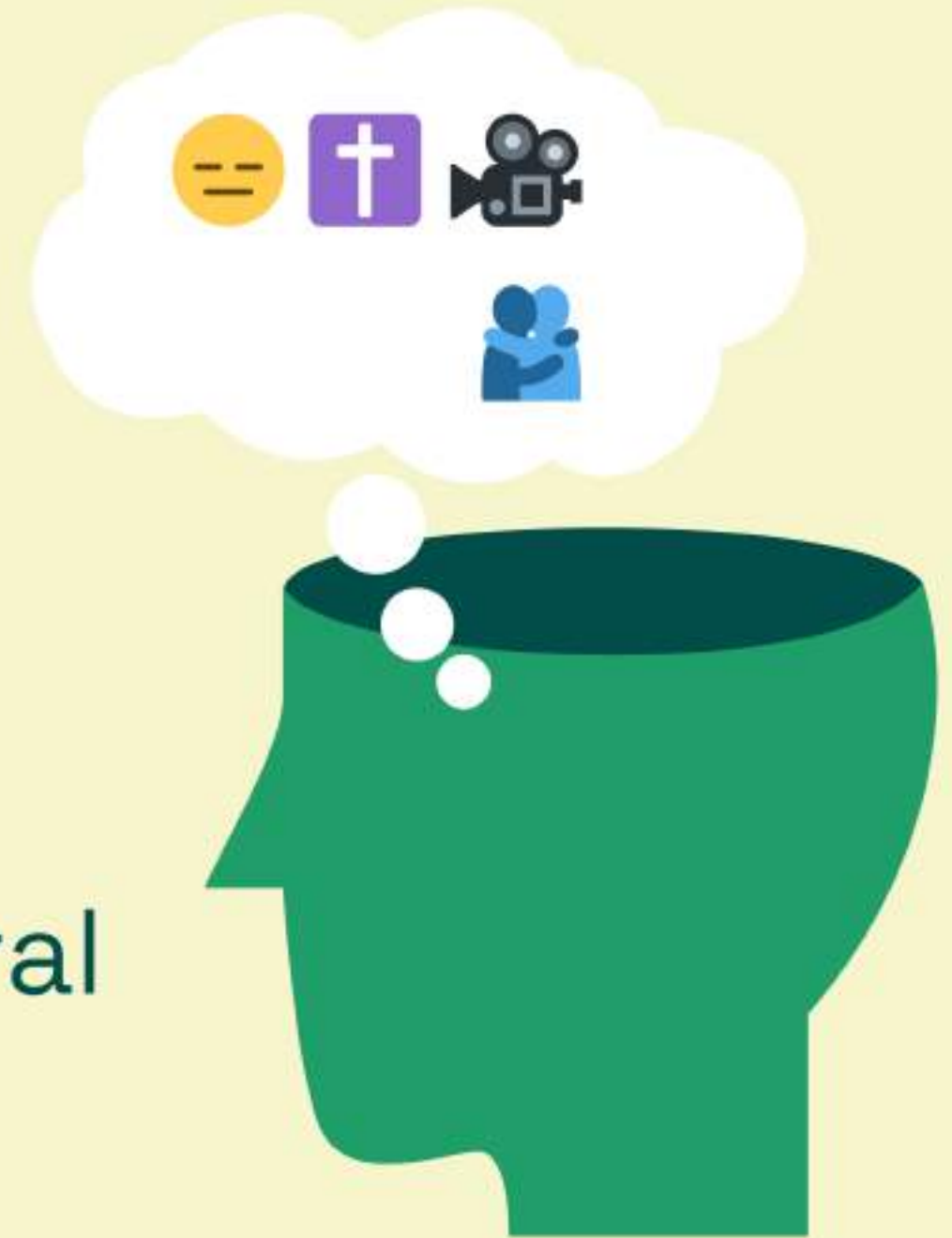


# How communication actually works\*

Mental model



Mental model



Medium is not neutral

\*According to the latest studies in social sciences



# Know your audience

Ask yourselves the following questions:

- Who do we want to reach?
- Why do we want to reach them?
- Is there someone that we are not reaching? Why?
- Is there someone we are reaching... who could have a negative reaction?





# Know your audience

Consult previous work on the topic



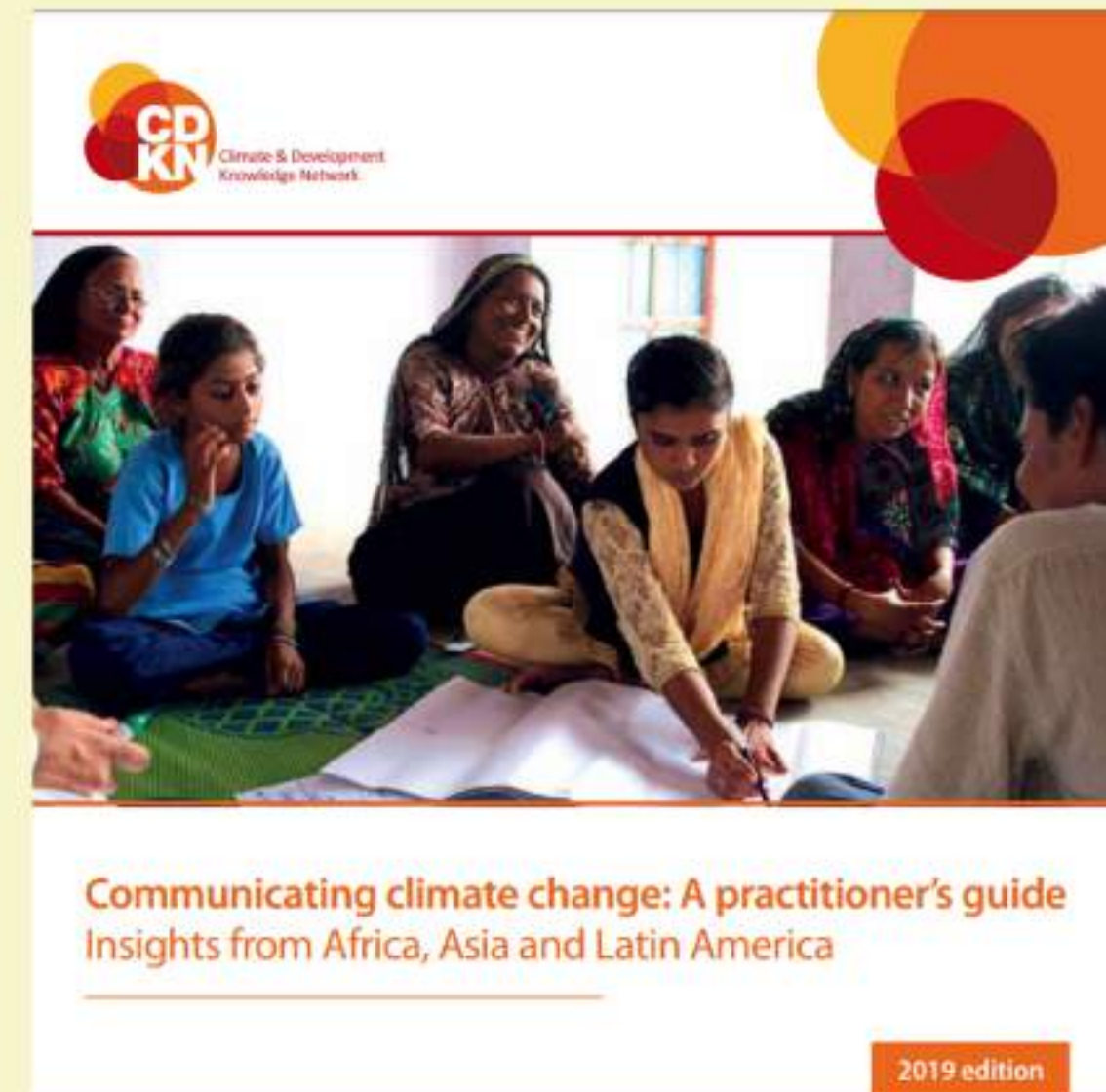
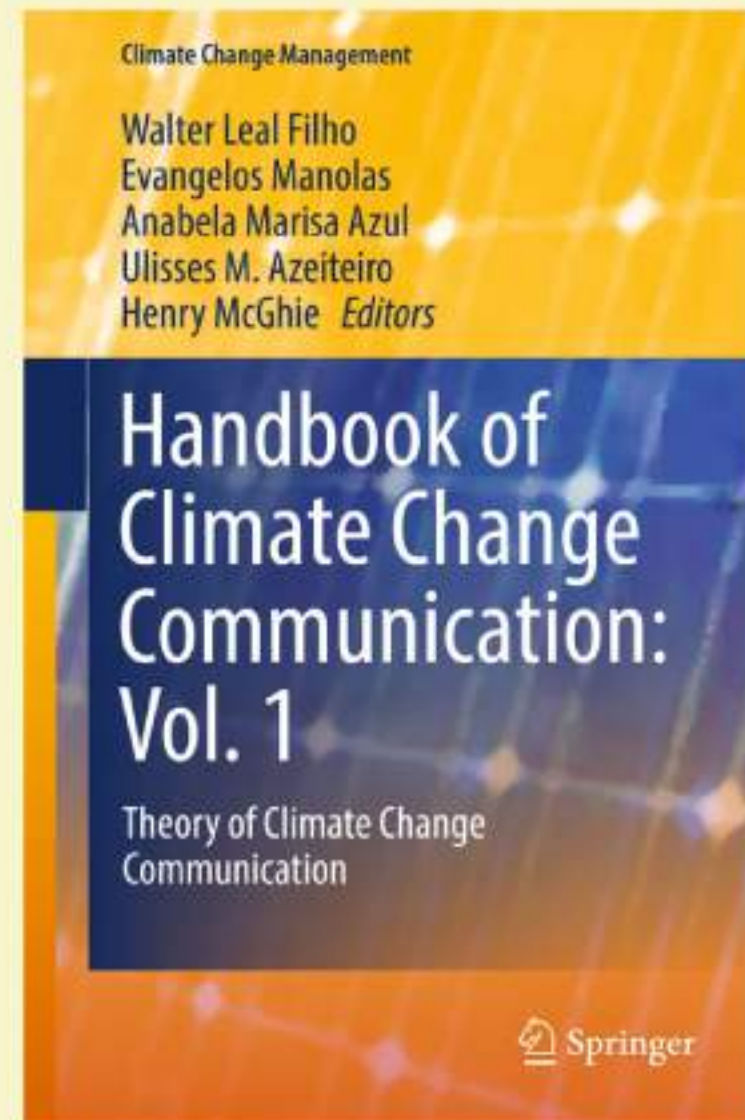
Whatever your field of work is,  
there's social science research:

- public perceptions
- psychological effects
- mental frameworks
- preconceived ideas



# Know your audience

## The case of climate: UNDP and others



# Pro tip: know yourself

Your own biases play a key role too



# Pro tip: know yourself

Your own biases play a key role too



Do you think people are afraid of chemicals?

# Do people like chemistry?

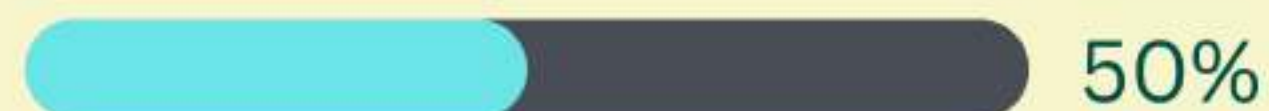


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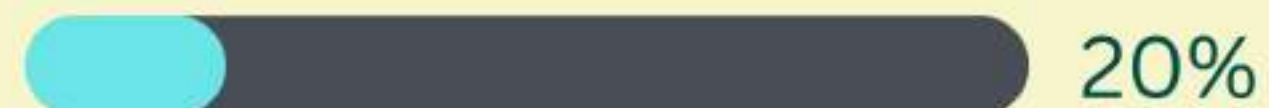


# Personal bias

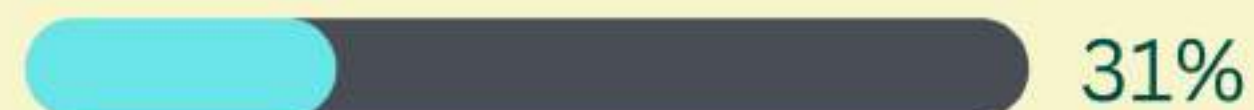
What chemists think  
people think



Chemicals are dangerous



Chemists are approachable



Chemistry is beneficial

Royal Society of Chemistry "Public attitudes to chemistry", 2015. More info: <https://rsc.li/pac>

# Personal bias

What chemists think  
people think



Chemicals are dangerous

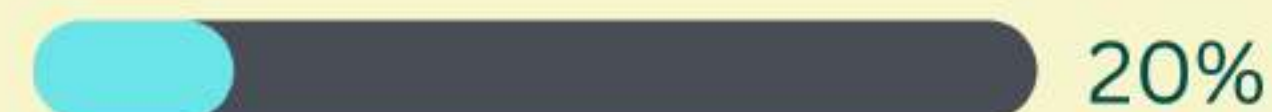


Chemists are approachable

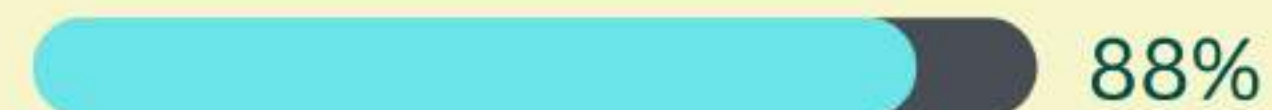


Chemistry is beneficial

What people actually  
think



Chemicals are dangerous



Chemists are approachable



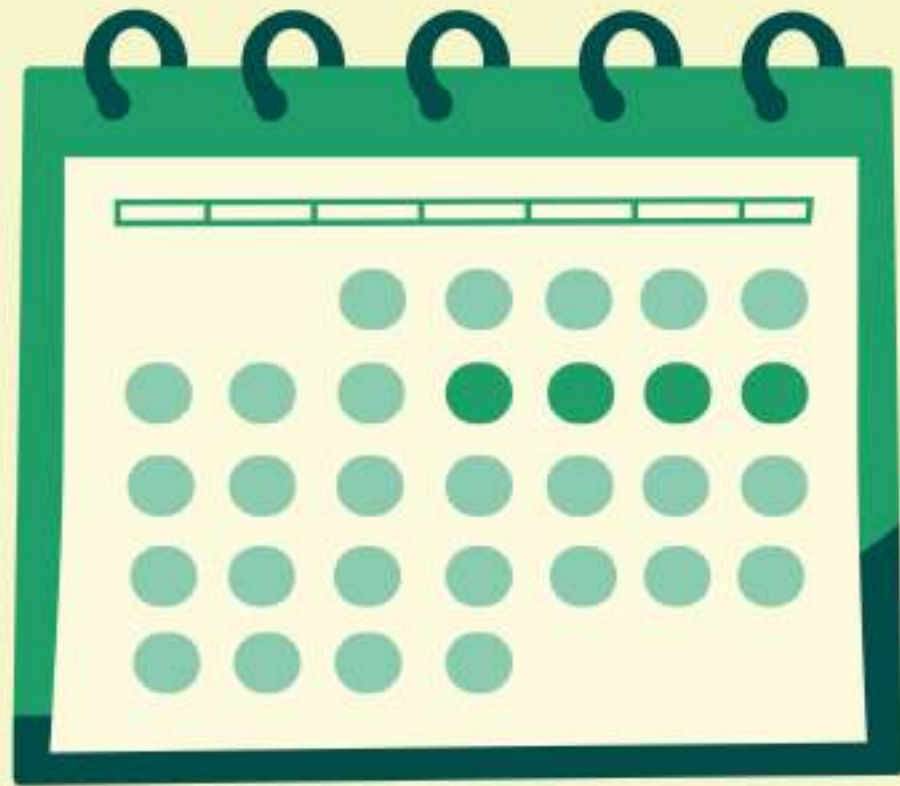
Chemistry is beneficial

Royal Society of Chemistry "Public attitudes to chemistry", 2015. More info: <https://rsc.li/pac>



# Planning is paramount

The biggest secret of influencers: nothing is live!



- Find time to plan for your content
- Make sure to tailor the content to different platforms and timeframes
- Hop on existing, successful trends



# Planning is paramount

24	25	26	27	28
2:02 PM	1:58 PM	2:03 PM	1:59 PM	1:57 PM
2:02 PM	1:58 PM	2:03 PM	1:59 PM	1:57 PM
2:02 PM	1:58 PM	2:03 PM	1:59 PM	1:57 PM
6:05 PM	6:01 PM	5:56 PM	6:02 PM	6:04 PM
6:05 PM	6:01 PM	5:56 PM	6:02 PM	6:04 PM
6:05 PM	6:01 PM	5:56 PM	6:02 PM	6:04 PM
31	1	2	3	4
1:08 PM	12:54 PM	4:56 AM	1:03 PM	12:58 PM
1:08 PM	12:54 PM	4:56 AM	1:03 PM	12:58 PM
1:08 PM	12:54 PM	4:56 AM	1:03 PM	12:58 PM
4:58 PM	4:58 PM	1:09 PM	4:54 PM	5:10 PM
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4:58 PM	4:58 PM	1:09 PM	4:54 PM	5:10 PM

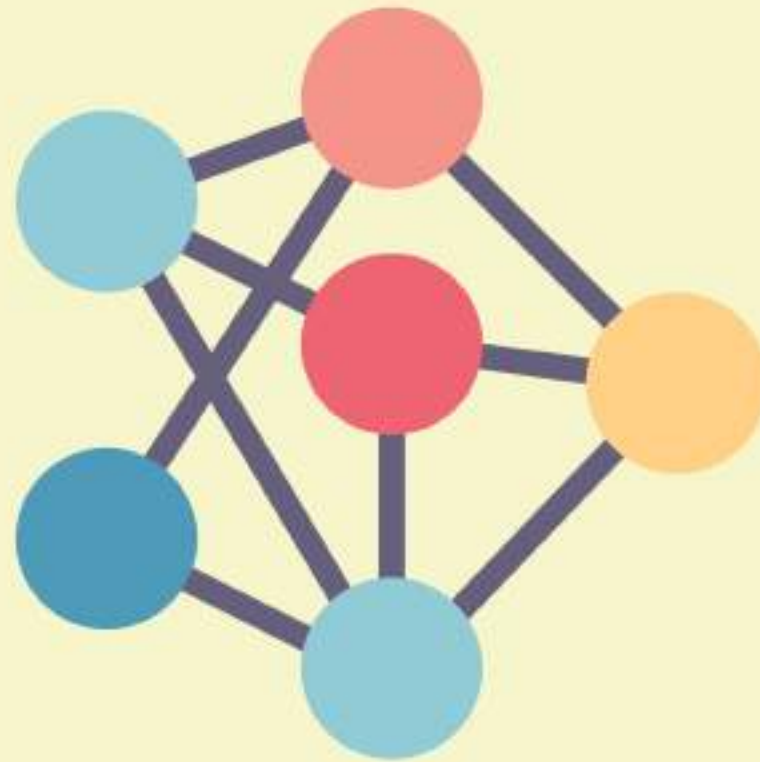




# Planning is paramount

Establish **strong networks** to amplify your message

Tag relevant people  
and institutions  
(but don't spam)



Use social media to  
trigger conversations  
and fruitful debates

Join forces with  
friends on different  
platforms



# It's an experiment!



On top of planning, make sure you **gather data to measure and evaluate your results.**

**Understand what works and what doesn't, make the most of detailed statistics.**



# Tips & tricks



Storytelling

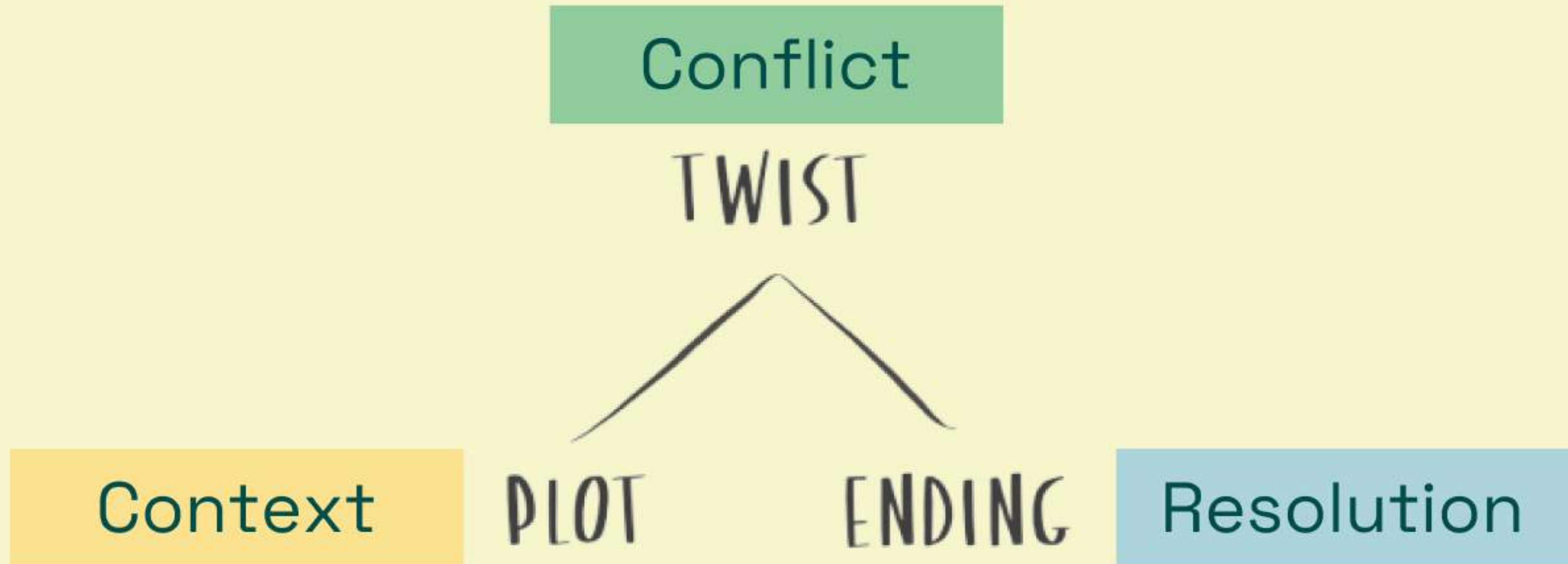


Plan your actions



Writing tips

# Remember: ABT is key





# The principles of writing



## Cut

Remove unnecessary words and phrases



## Active

Avoid passive voice if possible



## Verbs

Use strong, moving verbs

K. Sainani: "Writing in the Sciences: Module 1".

# One idea per paragraph

Use ABT to create content in every paragraph.



Use paragraphs to organise the ideas and points.

Pro tip: always end the paragraph with a short take-home message.



# Outline your story

## IUPAC Top Ten – Nat Chem Comment

### Introduction (100-200w)

- Brief mention to societal challenges (SDG), chemistry has the solution
- Identify key 'fringe' technologies, between the scientific discovery and commercial reality – what we mean by emerging technology

### Why, IUPAC as a voice for chemists worldwide (200-300w)

- The origins of the initiative, other similar endeavours (MIT, WEF, etc) – What is new. Why in chemistry.
- Short info about IUPAC, beyond nomenclature
- IUPAC is changing (IUPAC adapts for its next 100 years of history, 2019 conference, IYCN, GWB, Diversity Committee, AI, Digital Space)
- Becoming a voice for all chemists around the world
- Using its broad network of experts to scout, identify, and explain the chemistry technologies that are redefining in lives, economy, and relationship with the environment.

### The technologies, an overview and selection of 2019-2021 picks (400-500w)

- Why are technologies selected – How are the technologies selected
- Focus on open-access approach, everybody submits, articles are free
- Examples of good "predictions", ie Rapid tests, RNA Vaccines, Solid-state batteries, MOFs (we can adapt depending on 2021 Nobel Prize)

- Use the outline to gather ideas, as many as possible
- Add "raw" references, including papers and quotes you don't want to miss
- Ballpark the length of each paragraph, and plan its substructure



# Frame your story

Find "hooks" that  
connect with your  
audience



Personal anecdotes  
& day-to-day stuff  
always works

Keep in touch with current  
events, stories that people  
really care about.



# Example: current events





# Example: climate & beer 🍺🍺





# Example: personal stories

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## Genetic privacy: We must learn from the story of Henrietta Lacks

[f](#) [t](#) [w](#) [in](#) [re](#) [m](#) [e](#)

HEALTH | COMMENT 1 August 2020

By [Maninder Ahluwalia](#)

[The Washington Post](#)  
*Democracy Dies in Darkness*

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INSPIRED LIFE

## She's made 1,750 Wikipedia bios for female scientists who haven't gotten their due

'Not only do we not have enough women in science, but we aren't doing enough to celebrate the ones we have,' said physicist Jess Wade.

By [Sydney Page](#)

October 17, 2022 at 6:00 a.m. EDT

Ad closed by Google



# Editing and reviewing



- Find editors you trust, learn from the edits
- It's OK to get help! It gives you different points of view
- Make constructive comments
- Find diverse editors and consider sensitivity edits
- Highlight the good things!



# Tips & tricks



Storytelling



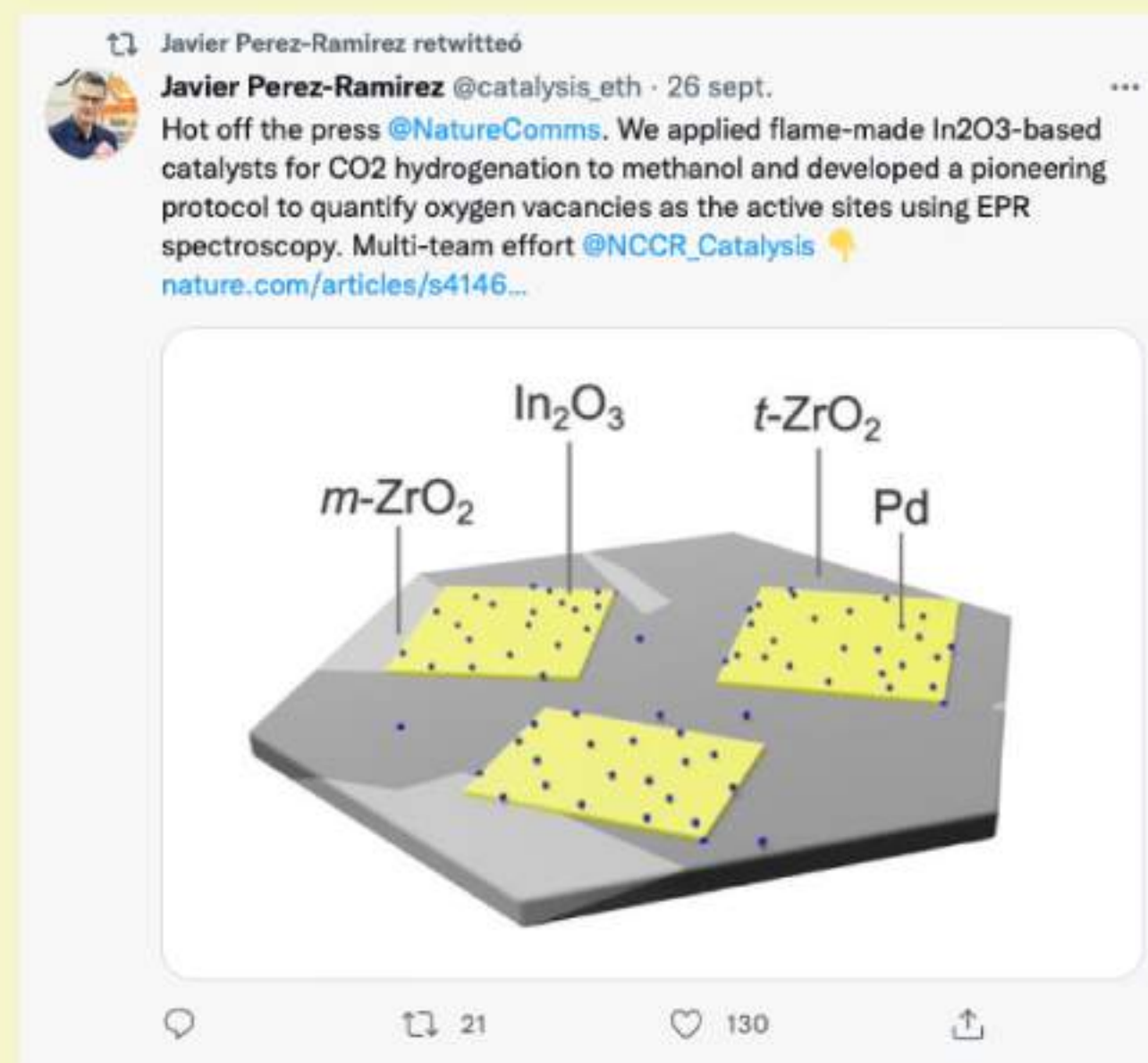
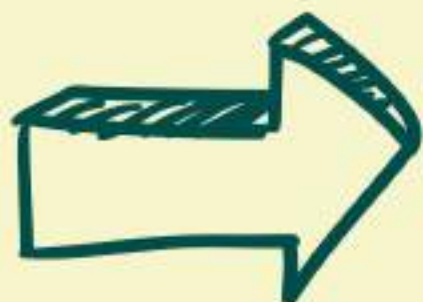
Plan your actions



Writing tips for  
under 280 charac

-6

# From paper to tweet





# From paper to tweet

Let's analyse!

Mentions  
publisher



Link to the paper  
(ideally open access)

Mentions  
main funder



# From paper to tweet

Adapt for your audience



↻ Javier Perez-Ramirez retweeted



**Javier Perez-Ramirez** @catalysis\_eth · 26 sept. ...

Hot off the press @NatureComms. We applied flame-made  $\text{In}_2\text{O}_3$ -based catalysts for  $\text{CO}_2$  hydrogenation to methanol and developed a pioneering protocol to quantify oxygen vacancies as the active sites using EPR spectroscopy. Multi-team effort @NCCR\_Catalysis 📌  
[nature.com/articles/s4146...](https://nature.com/articles/s4146...)



**Research Centre**  
@ResearchCentre ...

Our researchers have discovered a new way to make methanol from  $\text{CO}_2$ . ☁️ 🏠 The results, published in @NatureComms, demonstrate carbon dioxide could become a valuable feedstock towards renewable commodity chemicals! 🏭 ♻️ Full story here: <https://bit.ly/3RBKpol>

Less jargon

Emojis for  
'playfulness'



# From paper to tweet

Distill the really important information



- What's the key result?
- What makes it special?
- How could you illustrate it?
- Find relevant hashtags
- Think about your target audience

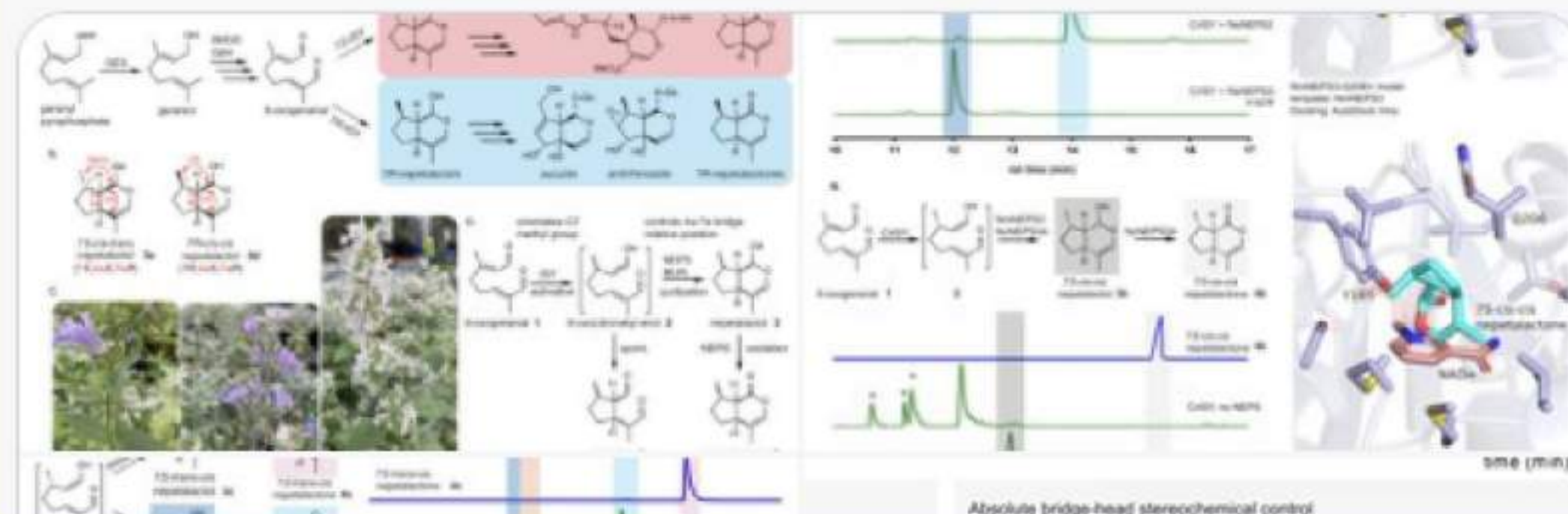


# From paper to tweet

Distill the really important information

**Enzyme Chemistry** @EnzymeChemistry · 11 ago.

#Biocatalytic routes to stereo-divergent iridoids by N. Lozada, B. H. Wood, L. Caputi, J. Basquin, L. Chuang, M. Kunert, @carlos\_plants, Langley, D. Zhao, @robin\_buell, @LichmanLab, @OConnor\_lab at @MPI\_CG in @NatureComms [nature.com/articles/s41466-023-01466-1](https://nature.com/articles/s41466-023-01466-1)





# From paper to tweet

Think creatively! Text isn't the only way to showcase information.

Twitter threads to expand beyond the 280 character limit.



Include information within the embedded pictures or videos.

Make sure to grab your readers' attention quickly: emojis, GIFs and videos help.



# From paper to tweet

Twitter hosts a huge community of academics and publishers, but don't forget other platforms could reach your ideal audience better.

Kirsten Banks is an amazing example of rigorous outreach that's also fun and accessible!

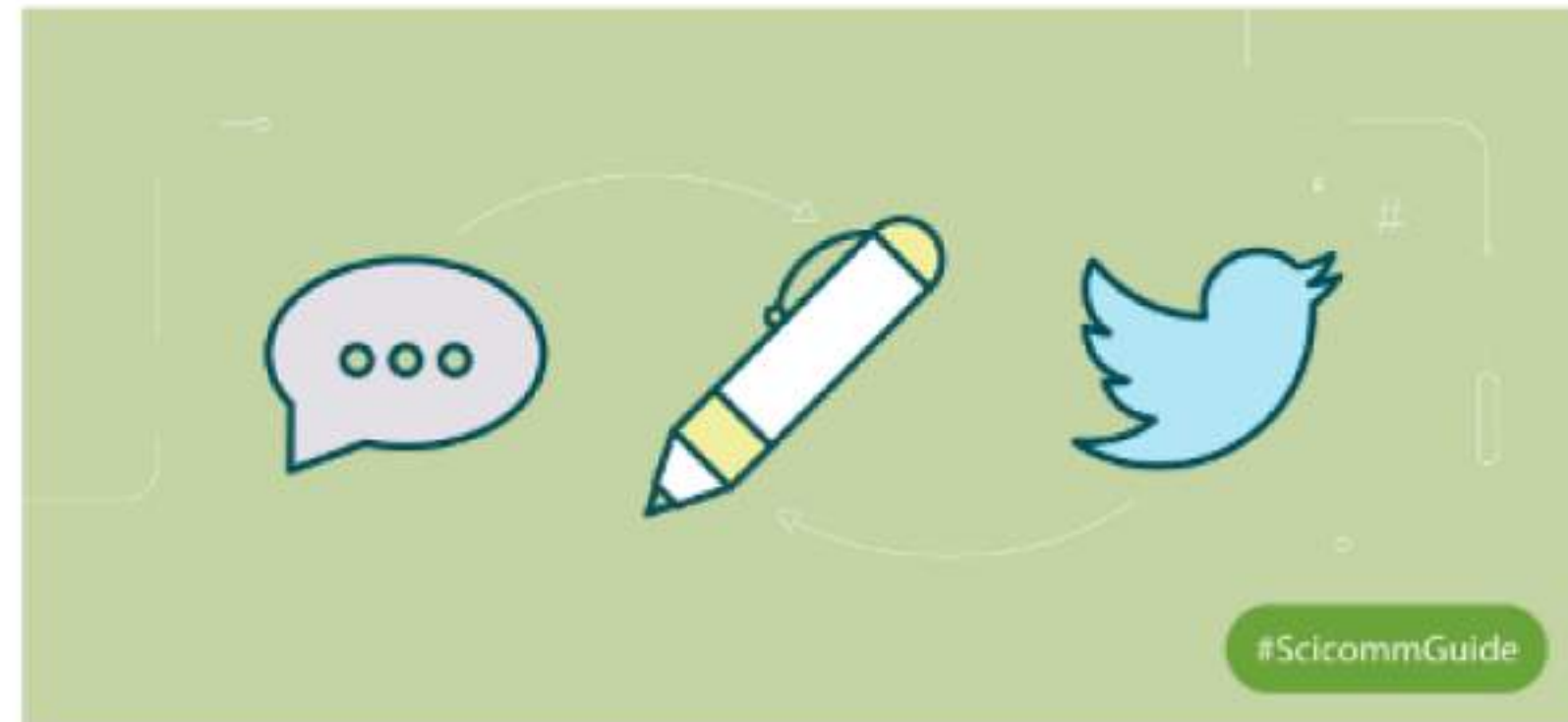




# Choose your favourite!

## Speak, write, tweet: ways to communicate science

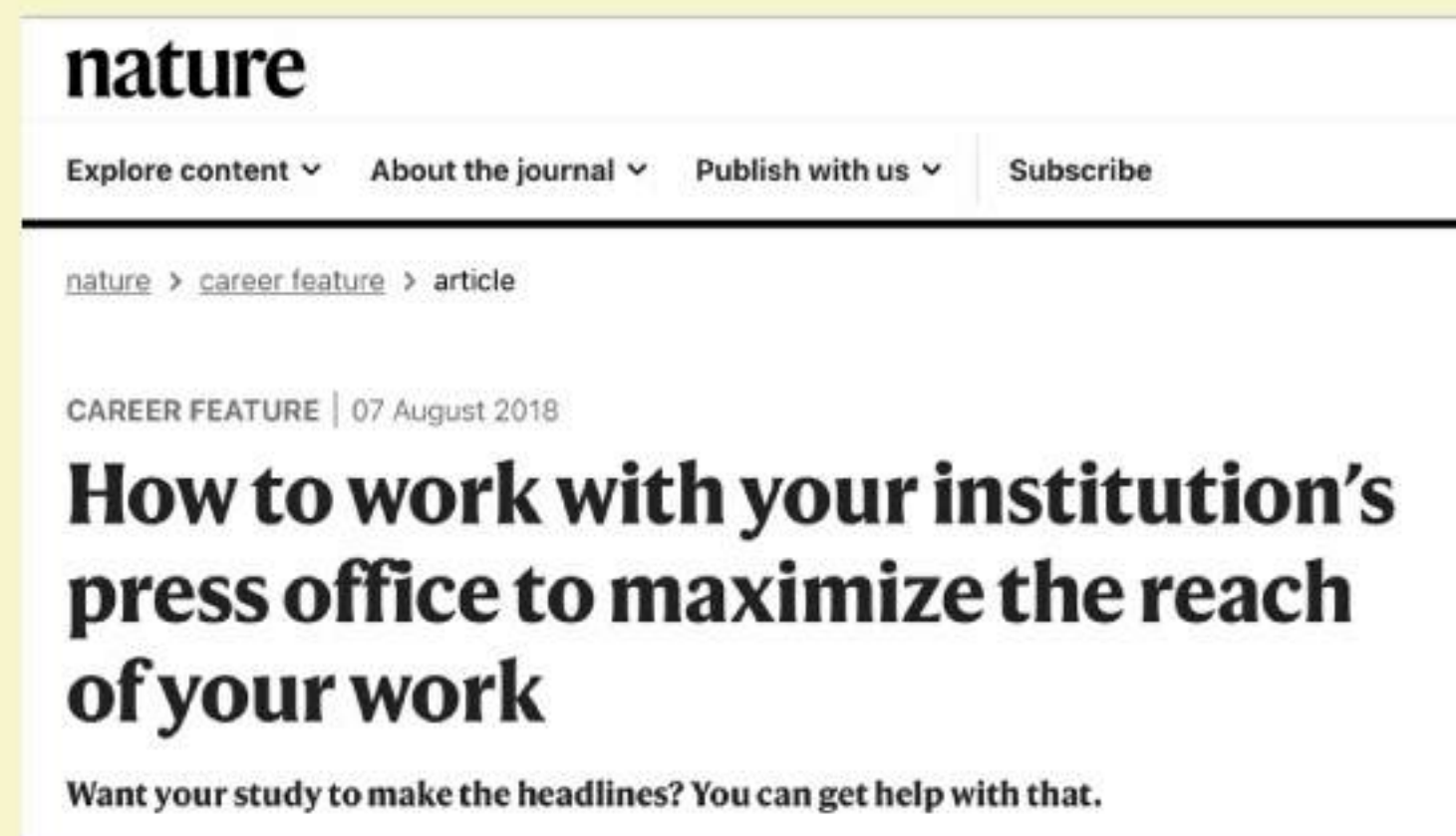
Opinion



Sharing your science: what type of communication is best for you?

J. Bowers. Hindawi Blog, 2020, link: <https://tinyurl.com/trp8ok9>

# Know your comms team



- It's a chance to explain why your work is interesting
- Choose the message and the audience together
- Think big: NYT has 2.6M subscribers, BBC reaches 350M people weekly

Kwok, R. Nature, 2018, 560, 271. DOI: 10.1038/d41586-018-05896-2.



# Free resources



The Open Notebook  
[www.theopennotebook.com](http://www.theopennotebook.com)



Talking science  
[bit.ly/ScicommCourse](http://bit.ly/ScicommCourse)



# Free resources



## 5 tips to talk to media

<http://bit.ly/3ohMFUj>










## Comms for scientists

<http://go.nature.com/2J4imk0>



# Free resources



-  [Associations](#)
-  [Books & Publications](#)
-  [Formal Education](#)
-  [Free Courses](#)
-  [Job Offers](#)
-  [Scicomm Volunteering](#)
-  [Other resources](#)

## ScicommTips

<http://bit.ly/ScicommTips>

# Recap slide?



## Scicomm basics

- Think about positive impact
- Every paper tells a story
- Storytelling is a strategy



## Writing tips

- Outline, edit, read
- Frame your story to connect
- Think creatively



## Plan everything

- Know your audience
- Establish & maintain networks
- Test, test, test



## Take-home messages

- Find a format that fits
- Collaborate, work with experts
- Learn online!



# Talk to us!



(Or other scicomm agencies,  
we don't mind)



hello@agata.agency  
www.agata.agency