

WRITING FOR AUDIENCES OUTSIDE ACADEMIA (STEM)

Macrina Cooper-White
Maureen Sampson

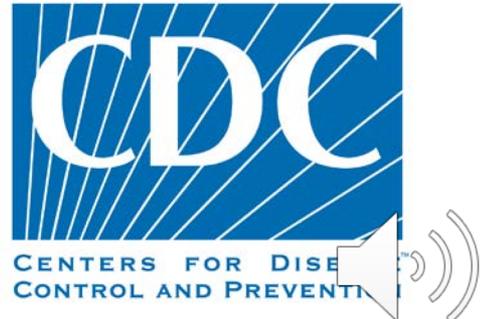


About Us



Macrina Cooper-White
Current: Psychology PhD Student
Former: Writer @HuffPostScience

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Current: Molecular Toxicology PhD Student
Former: Centers for Disease Control & Prevention



Workshop Topics

- I. Why Write for a Non-Academic Publication?
- II. Types of Non-Academic Writing & Places to Publish
- III. Positioning Your Ideas for a Broader Audience
- IV. Plain Language for Clear, Concise Writing
- V. Pitching and Promoting



Why Write for a Non-Academic Publication?



Why Write for a Non-Academic Publication?

Personal Benefits:

- Synthesizing and simplifying your research can help you understand it better – especially true of the “big picture” claims
- Gives you a different way of approaching and thinking about your work outside of academia (and thinking about why it matters!)
- Gives you a chance to work more creatively and add personal perspective
- Gives you experience outside academic context, allowing you to explore potential alt-ac career paths
- In some cases might involve small form of payment



Why Write for a Non-Academic Publication

Professional Benefits:

- Gives YOU and YOUR WORK exposure to a broader audience
- Shows academic job market that you have a public profile
- Offers networking opportunities with non-academics that is crucial for alt-academic jobs
- For alt-ac jobs, shows ability to operate outside of the university context
- Demonstrates ability to break down complex ideas into accessible forms, a boon for any teaching profile



Types of Non-Academic Writing & Places to Publish



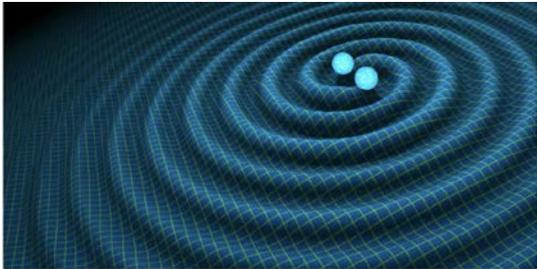
Types of Non-Academic Publication

- Science writing
 - News article
 - Op-ed
 - Interview
 - Educational Content
 - Blog
- Other forms of science communication
 - Podcast
 - Videos
 - TED Talk
- Government writing
 - Educational content
 - For scholars



Types of Non-Academic Publication

- News article



 649

 530


Math may have caught up with the swirling mergers of black holes like the one in this simulation, R. HURT/CALTECH-JPL

Theorist calculates the incalculable siren song of merging black holes

By Adrian Cho | May 2, 2019, 3:10 PM

Just a month into a renewed observing campaign with a trio of detectors, physicists today announced they have spotted more gravitational waves—fleeting ripples in space set off when two massive objects such as black holes spiral into each other. The collaboration has now bagged 13 merging black hole pairs, as well as two pairs of neutron stars. But even as detections accumulate, one theorist has made an advance that could change how the team analyzes the signals and make it easier to test Albert Einstein's theory of gravity, general relativity.



Types of Non-Academic Publication

- Op-Ed

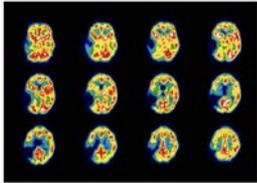
Observations

We've Made Astonishing Progress in Treating Stroke

During Stroke Awareness Month, it's important to note how far we've come, but also how much we still need to learn

By Walter J. Koroshetz on May 7, 2019





PET scans of a stroke victim's brain. Credit: Getty Images

May is Stroke Awareness Month, so it's the perfect time to look at how far we've come—a highlight of my career has been the story of stroke treatment and recovery—but not lose sight of what's ahead.

When I started in a position at Mass General, there were little we could do.

LATEST NEWS

-  In "holiest cycle," Stowport Falls, Wildfires, and Wildfires Melt Snow
-  The World Health Organization Needs to Put Human Behavior at the Center of Its Initiatives
-  We Need to Make Organ Transplantation Easier
-  Can Fiber Cancel Out Calories?



Types of Non-Academic Publication

- Interview

← → ↻ 🏠 <https://anthonybonato.com/2018/05/23/interview-with-a-mathematician-richard-k-guy-2/>

📱 Apps 📁 CIB Surveys 📁 Opin. in Brain Sur... 📁 Protocols 📁 Logs ⭐ Bookmarks 📁 Imported From Sa... 📁 Minerva 2

Interview with a mathematician: Richard K. Guy

I'm at the University of Calgary this week working with collaborators, and while here I had the chance to chat with Richard Guy. The photo below was taken in the Mathematics faculty lounge on Victoria Day, which is a holiday here in Canada. Richard, who is now 101, was in his office beforehand, working hard all morning. He's an inspiration to me and so many others.



Richard K. Guy, Robert Woodrow, and me, May 2017.

In Richard's honor, I'm reposting my interview with him from last year. Enjoy! - AB

Richard K. Guy is the only mathematician I know working at age 100.

A professor at the University of Calgary, Richard is an expert in geometry, number theory, graph theory, and he is especially known for his contributions to combinatorial game theory. A prolific author with over 300 papers, he has worked with the greats such as Paul Erdős, John Conway and Donald Knuth.



Types of Non-Academic Publication (cont'd)

- Educational content

Psychology In Action [HOME](#) [ABOUT](#) [BLOG POSTS](#) [GRAD INTERVIEWS](#) [PODCASTS](#) [EVENTS](#) [SEARCH](#) 

August 13, 2016 · Stacy Shaw

What is a Sampling Distribution?

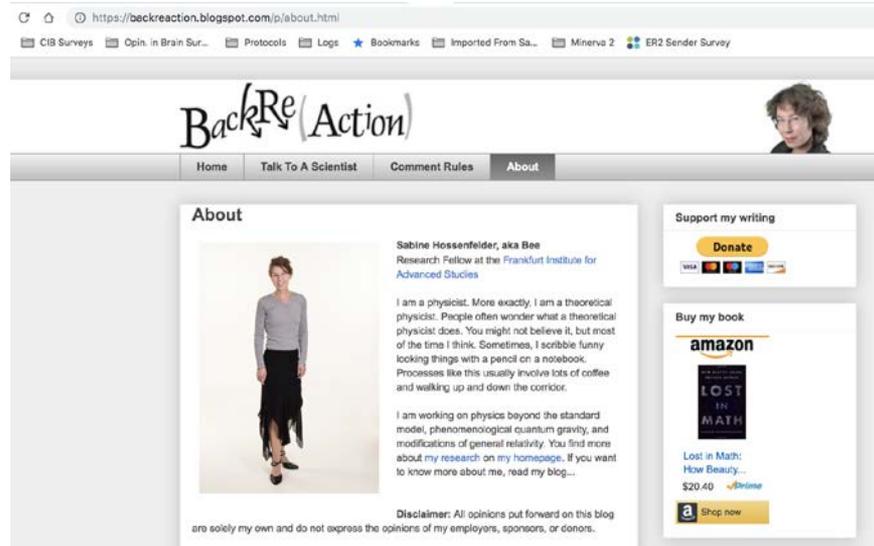
The sampling distribution is one of the most important concepts in inferential statistics, and often times the most glossed over concept in elementary statistics for social science courses. This article will introduce the basic ideas of a sampling distribution of the sample mean, as well as a few common ways we use the sampling distribution in statistics. When we conduct a study in psychology, this almost always includes taking a sample and measuring some aspect or characteristic about that sample. While we assume that a large enough sample will represent the population enough to make statistical inferences, there can be natural variation between two different samples taken from the same population. This sampling variation is random, allowing means from two different samples to differ. The sampling distribution of the sample mean models this randomness.

<https://www.psychologyinaction.org/psychology-in-action-1/2016/08/13/what-is-a-sampling-distribution?rq=statistics>



Types of Non-Academic Publication (cont'd)

- Blog



The screenshot shows a web browser window displaying the 'About' page of the 'BackRe(Action)' blog. The browser's address bar shows the URL <https://backreaction.blogspot.com/p/about.html>. The page features a navigation menu with links for 'Home', 'Talk To A Scientist', 'Comment Rules', and 'About'. The main content area is titled 'About' and includes a photograph of Sabine Hossenfelder, a research fellow at the Frankfurt Institute for Advanced Studies. The text describes her as a theoretical physicist who writes about her research and daily life. A disclaimer at the bottom states that the opinions expressed are solely her own. To the right of the main content, there are two sidebars: one for 'Support my writing' with a 'Donate' button and payment icons, and another for 'Buy my book' featuring the book 'Lost in Math' on Amazon for \$20.40.

BackRe(Action)

Home Talk To A Scientist Comment Rules About

About

Sabine Hossenfelder, aka Bee
Research Fellow at the Frankfurt Institute for Advanced Studies

I am a physicist. More exactly, I am a theoretical physicist. People often wonder what a theoretical physicist does. You might not believe it, but most of the time I think. Sometimes, I scribble funny looking things with a pencil on a notebook. Processes like this usually involve lots of coffee and walking up and down the corridor.

I am working on physics beyond the standard model, phenomenological quantum gravity, and modifications of general relativity. You find more about my research on my homepage. If you want to know more about me, read my blog...

Disclaimer: All opinions put forward on this blog are solely my own and do not express the opinions of my employers, sponsors, or donors.

Support my writing

Donate

Buy my book

amazon

LOST IN MATH

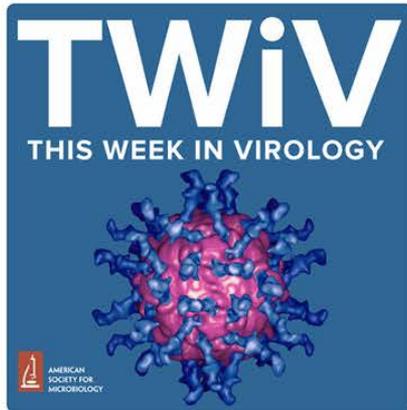
Lost in Math: How Beauty...
\$20.40

Shop now



Types of Non-Academic Publication (cont'd)

- Podcast



100 episodes

Play ▶

TWiV is a weekly netcast about viruses - the kind that make you sick. Professors Vincent Racaniello, Dickson Despommier, Rich Condit, Kathy Spindler and science writer Alan Dove and guests deconstruct viruses, how they cause illness, and dissect the latest research.

This Week in Virology

American Society for Microbiology

Medicine

★★★★★ 4.9, 582 Ratings

[Listen in iTunes ↗](#)



MAY 5, 2019

TWiV 546: Delta blues and chitlins >

The un-encapsidated TWiV Humans discuss finding hepatitis D virus-related sequences in birds and snakes, and fatal swine acute diarrhoea syndrome caused by a coronavirus of bat origin.

▶ PLAY 2 hr 2 min

APR 28, 2019

TWiV 545: Biocrimes and misdemeanors >

Jens Kuhn returns to TWiV to explain Select Agents, Priority Pathogens, Australia List Pathogens, Risk Group Agents, biosafety, biosecurity, and biosurety.

▶ PLAY 1 hr 44 min



Types of Non-Academic Publication

- Video series (e.g. YouTube Channel)
 - **Target may be a general audience:** Explain your work and/or other topics in your field, discuss what your life as a scientist is like
 - **Target may be other scientists:** Explain how to do certain types of analyses



My polar vortex PhD thesis: explained

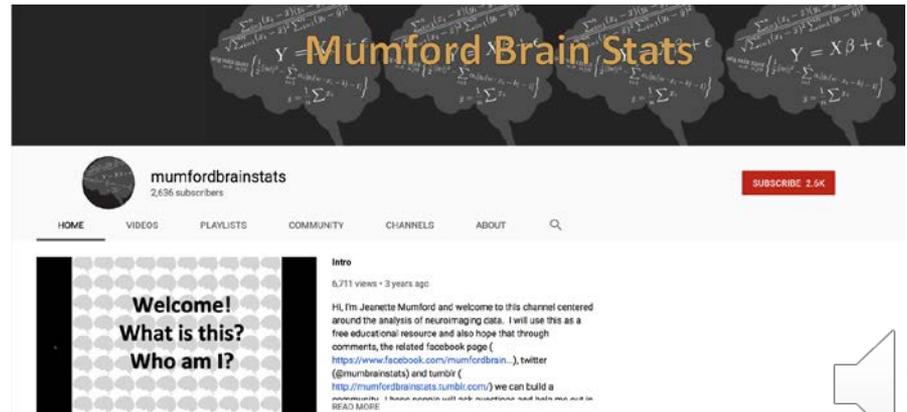
42,770 views

2.3K 28 SHARE SAVE



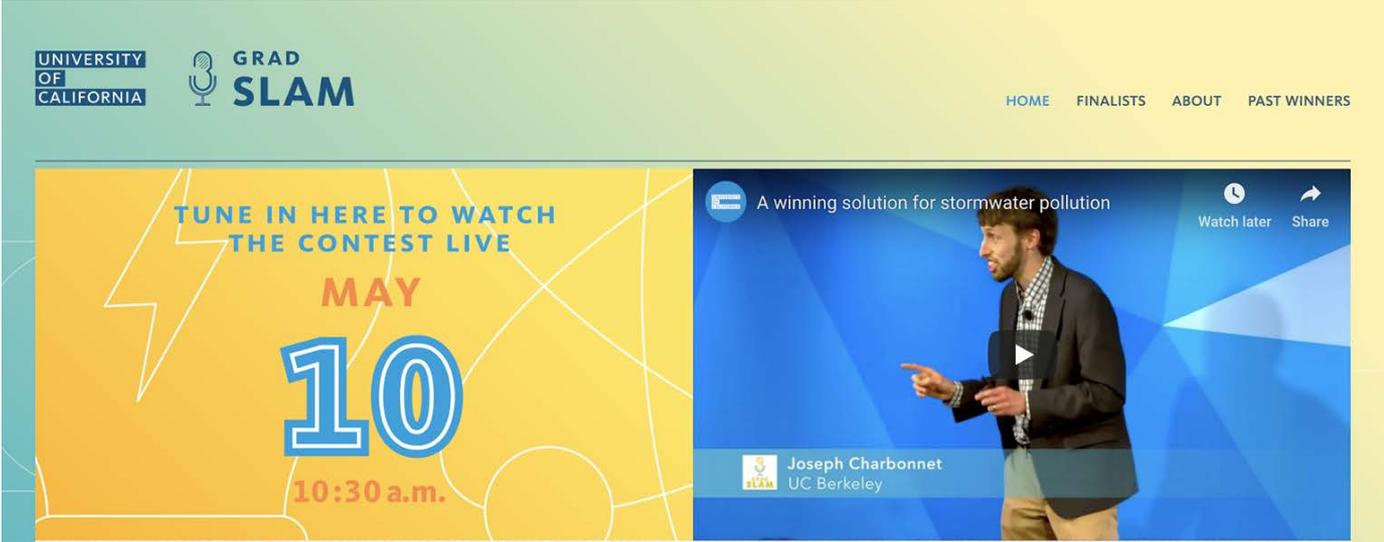
Simon Clark ©
Published on 21 Feb 2019

SUBSCRIBE 213K



Types of Non-Academic Publication

- TED Talk-style talks
 - Might not be the first thing that comes to mind, but this is definitely a form of science communication!
 - Opportunities for students via channels such as competing in GRAD Slam



The image shows a screenshot of the University of California GRAD SLAM website. The header includes the University of California logo and the GRAD SLAM logo, which features a microphone icon. Navigation links for HOME, FINALISTS, ABOUT, and PAST WINNERS are visible. A large yellow banner on the left reads "TUNE IN HERE TO WATCH THE CONTEST LIVE MAY 10 10:30 a.m." with a lightning bolt graphic. On the right, a video player shows a man, Joseph Charbonnet from UC Berkeley, presenting on a stage. The video title is "A winning solution for stormwater pollution". A speaker icon is located in the bottom right corner of the slide.

Types of Government Publications

Educational - For general public

You may be hearing a lot about measles lately. And all of this news on TV, social media, Internet, newspapers and magazines may leave you wondering what you as a parent really need to know about this disease. CDC has put together a list of the most important facts about measles for parents like you.

1. Measles can be serious.

Some people think of measles as just a little rash and fever that clears up in a few days, but measles *can* cause serious health [complications](#), especially in children younger than 5 years of age. There is no way to tell in advance the severity of the symptoms your child will experience.



Types of Government Publications

Scientific - For Scholars

National Health and Nutrition Examination Survey

2009-2010 Data Documentation, Codebook, and Frequencies

Volatile Organic Compounds (VOCs) - Blood (VOCWB_F)

Description of Laboratory Methodology

An automated analytical method was developed using capillary gas chromatography (GC) and mass spectrometry (MS) with selected-ion monitoring (SIM) detection and isotope-dilution. This method quantifies levels of individual VOCs in whole blood to low-parts-per-trillion range. Because non-occupationally exposed individuals have blood VOC concentrations within this range, this method is applicable for determining these quantities and investigating cases of sustained or recent low-level exposure.



Places to Get Published

- This is a starting list, but there are many, many more!
- Newspapers and magazines - mostly online now
 - *E.g. The New York Times, Popular Science, WIRED*
- News sites with regular bloggers/columnists
 - *E.g. The Huffington Post, Slate, Scientific American, Discover*
- Community science blogs/newsletters - vary in scope, from broad to field-specific
 - *E.g. The Guardian's Science Blog Network, Nature.com Blogs, ScienceBlogs, Psychology Today, The Situationist, RealClimate, Scientopia, PLOS BLOGS, The Node, etc.*
- Higher Education publications
 - *E.g. Vitae, Chronicle of Higher Education*



Ways to Self-Publish

- Personal Blog
 - E.g. Personal website, Wordpress, Blogger, Tumblr
- Personal podcast
- Personal video series
 - E.g. Youtube, Vimeo



Positioning Your Ideas for a Broader Audience



Translating Your Ideas For a Non-Academic Audience

- Review articles and publications that cover topics relevant to your interests for a mainstream audience
 - How do the publications or articles cover these topics? What language do they use? Key terms?
 - How are these pieces structured? What's the frame for introducing the topic/ideas? How do they work with evidence? How do they conclude?



Translating Your Ideas For a Non-Academic Audience

- Think about why a mainstream audience cares
 - Why would your friends outside of academia be interested?
 - Why would your parents be interested?
- Think about the what's novel about your findings
 - Is your work advancing basic science? Did you make a new discovery (even small discoveries are discoveries!) Did you develop a new methodology, tool, or intervention?
- Think about why your research is relevant in today's world
 - How does your research correspond to events in the news?
 - How does your research encounter current trends in fiction, television, film, general culture?
 - What are some ways that other researchers, policymakers, and/or the public might apply your findings?



Some more ideas to get you started...

<https://www.scientificamerican.com/page/submission-instructions/>

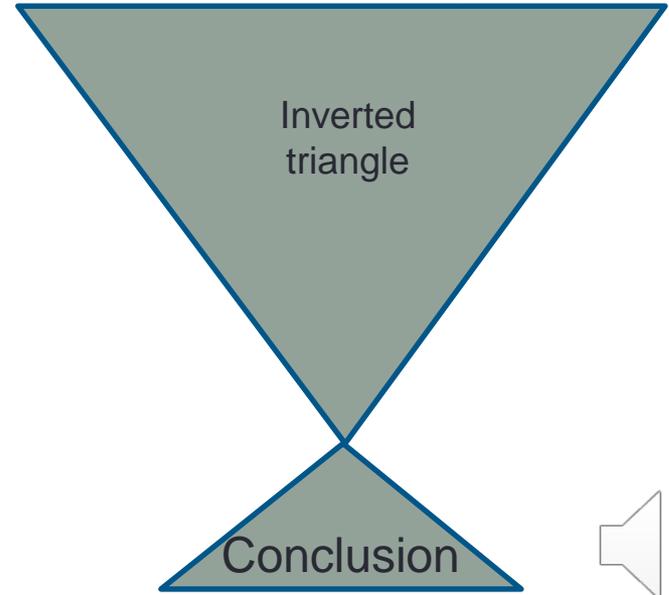


Stylistic Adjustments for Non-Academic Writing in Science

Typical structure of academic science writing



Typical structure of non-academic science writing



Stylistic Adjustments for Non-Academic Writing in Science

Typical structure of academic science writing

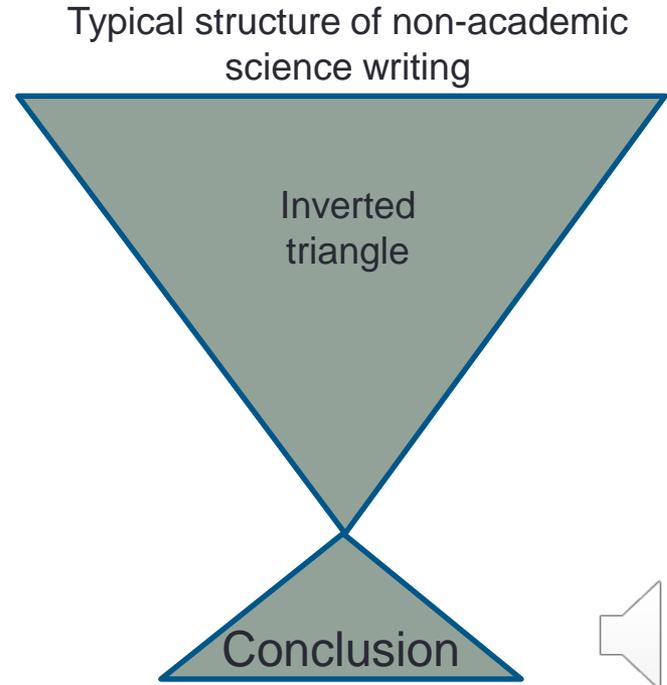


- Structure is often *rigid, formulaic* (IMRAD, or some variation of order)
- Ideas are put forward *sequentially* and *methodically*
 - Motivate research
 - Discuss what was done
 - Discuss what was found
- The **reader expects this traditional structure**, and reads accordingly
 - Reader examines parts they care about--whether it's particular methods or intro/discussion--most carefully



Stylistic Adjustments for Non-Academic Writing in Science

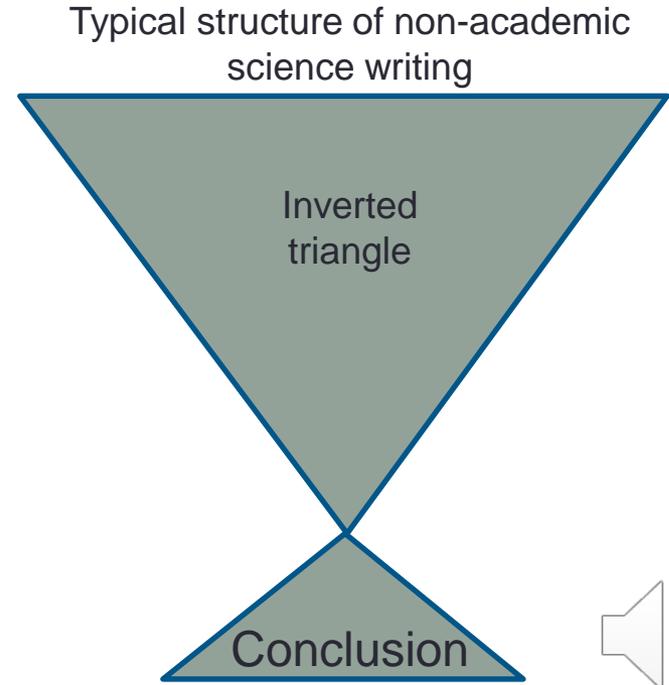
- Structure is more *flexible, variable*
- Most **important ideas** often come first (inverted triangle = start with big ideas, and then get detailed)
- Readers are likely to pay close attention to headline and first paragraph or so and then kind of drift off:
<https://slate.com/technology/2013/06/how-people-read-online-why-you-wont-finish-this-article.html>
- You can end with a broader point that you want to point



Stylistic Adjustments for Non-Academic Writing in Science

The Inverted Triangle Structure

- Start with summary of basic finding (get to the point early)
 - Include 5 W's (who, what, where...)
- Brief summary of methods (*just the gist*)
- Discussion of results
- Exploration of alternatives
- End with conclusion/implications – discussion of why your research matters



Stylistic Adjustments for Non-Academic Writing in Science

- Inverted triangle beginning:
Lead with a “lede”

“The most important sentence in any article is the first one. If it doesn’t induce the reader to proceed to the second sentence, your article is dead.” — William Zinsser, *On Writing Well*

- Straight news lede
- Anecdotal lede
- Scene-setting lede
- First-person lede
- Observational lede
- Zinger lede



Additional Thoughts for Translating Your Findings For a Non-Academic Audience

- Balance between accuracy and simplicity
 - Others who write about your work are more likely to go too far and over-simplify, to the point of distorting the message and being inaccurate; you're more likely to go too far to the precise but incomprehensible to many --> aim for the middle!
 - Know which details are necessary and which ones distract from your message
 - Imagine you are writing for an intelligent high school student.



Additional Thoughts for Translating Your Findings For a Non-Academic Audience

Example headlines:

BAD (INACCURATE) ✘	BAD (BORING) ✘	BETTER 😊
Science just proved that owning a dog makes you live longer.	Dog ownership and the risk of cardiovascular disease and death – a nationwide cohort study	Can having a dog help you live longer? Dog ownership linked to living longer, study finds



Citations

- Develop a non-academic citation strategy
 - This will look different than APA, MLA or Chicago style citations with which you are familiar
 - You may merely “cite” someone by saying: “As TK says, in an influential essay, ‘.....’”
 - Or you may hyperlink to the cited content.



Plain Language for Clear, Concise Writing



Writing in Government: Plain Language

Law and requirements

The [Plain Writing Act of 2010](#)  was signed on October 13, 2010. The law requires that federal agencies use clear government communication that the public can understand and use.



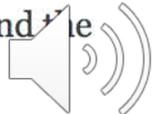
Writing in Government: Plain Language



ABOUT

What is plain language?

Plain language (also called plain writing or plain English) is communication your audience can understand the first time they read or hear it.



Guidelines for Plain Language Apply to General STEM writing

- Writing about technical concepts requires plain language to avoid reader fatigue
- Simplify your writing, but do not lose meaning that is necessary for the audience



Guideline #1: Write for your audience

- Who is your audience?
- What information is new?
- What questions will they have?
- What is the goal?



Guideline #2: Organize the information

- Provide context with a **topic sentence**
- Place main idea ahead of exceptions
- Make it easy to follow
- Use transition words



Guideline #3: Choose your words carefully

Use **strong, direct verbs**. Avoid using verbs as nouns.

BAD ✖	GOOD 😊
conduct data analysis	analyze



Guideline #3: Choose your words carefully

Avoid noun strings:

BAD ✖	GOOD 😊	BETTER 😊😊
<p><u>Underground mine worker safety protection procedures</u> development will protect workers.</p>	<p>Developing procedures to protect the safety of workers in underground mines is important.</p>	<p>These procedures will protect underground mine workers.</p>



Guideline #3: Choose your words carefully

- Avoid jargon
- Minimize abbreviations

BAD ✖	GOOD 😊
Studies in Asia, Europe, and North America have identified individuals with ASD with an average <u>prevalence</u> of about 1%.	<u>About 1 in 100 people</u> have autism spectrum disorder (ASD) in Asia, Europe, and North America.



Guideline #3: Choose your words carefully

CDC Original Sentence

A recent **case-control study** published in the Journal of 21st Century Medicine reported that 80 out of 100 patients with rheumatoid arthritis seen at a university rheumatology referral center were found to carry the common variant C707T of the rheumatoid arthritis (RA) gene (point mutation at position at 707).



Guideline #3: Choose your words carefully

CDC Original Sentence

A recent **case-control study** published in the *Journal of 21st Century Medicine* reported that 80 out of 100 patients with rheumatoid arthritis seen at a university rheumatology referral center were found to carry the common variant C707T of the rheumatoid arthritis (RA) gene (point mutation at position at 707).

Plain Language Sentence

A recent study published in the *Journal of 21st Century Medicine* **compared people with rheumatoid arthritis to people without it**. The results show that 4 of 5 people with the sickness had a particular gene with a common and important difference—variant C707T of the rheumatoid arthritis gene. (Note: 80 of 100 reduced to 4 of 5 because smaller numbers are more concrete and easier to understand.)



Guideline #3: Choose your words carefully

- Avoid **jargon**
- Minimize **abbreviations**

	Use “nicknames” 😊	Avoid ❌
Small-quantity handlers of universal wastes	waste handlers	SQHUW



Guideline #3: Choose your words carefully

Place words carefully:

- Keep subject and verb together

BAD ❌	GOOD 😊
<p><u>Precipitation</u> in the form of crystalline water ice, consisting of snowflakes that fall from clouds, <u>is</u> called snow.</p>	<p><u>Snow is</u> crystalline water ice that falls from clouds as snowflakes.</p>



Guideline #4: Be concise

- Use short sentences
- Remove unnecessary words

BAD ✖	GOOD 😊
a sufficient number of	enough
at this point in time	now
is able to	can



Guideline #4: Be concise

Write short paragraphs:

- Cover one topic
- Use 3-8 sentences
- Use **descriptive headings**



Guideline #5: Keep it conversational

Clarify who does what:

- Use **strong verbs**
- Use **active voice**
- Address audience “you”



Guideline #5: Keep it conversational

Write like you talk:

- Use Present Tense
- Use Contractions
- Give Examples



Guideline #6: Design for Reading

- Use figures/tables/lists
- Use white space
- Highlight important concepts with headings, fonts, or other emphasis



Guideline #6: Design for Reading

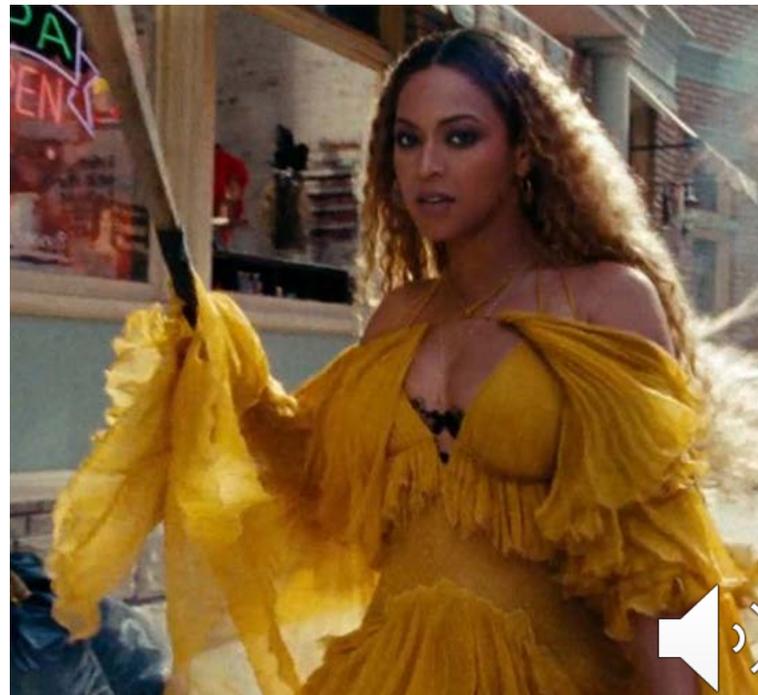
- Use figures/tables/lists
- Use white space
- Highlight important concepts with headings, fonts, or other emphasis

ALL CAPS IS NOT A GOOD EMPHASIS TECHNIQUE. IT IS HARD TO READ. ONLINE, IT'S CONSIDERED SHOUTING.



These are not “rules.”

Consider these guidelines as you write, but deviate as necessary.



Pitching & Promoting Non-Academic Publications



Pitching

- Search for contact information
 - Some sites will have basic contact info, while others will have more detailed submission instructions
- Pitching an idea v. “Cold-pitching”
 - **Pitching an idea:** Sometimes, you will have the luxury of pitching your idea for a story (which saves you lots of time in case they want major changes or reject it!)
<https://www.scientificamerican.com/page/submission-instructions/>
 - **Cold-pitching:** You send a fully written piece and hope for the best!
<https://help.nytimes.com/hc/en-us/articles/115014809107-How-to-Submit-an-Op-Ed-Article>



Compen\$ation From Pitching

- Talking about payment often makes students uncomfortable, but remember that you are providing a service and your work has **value**.
- Publications often run on little to no budget and may not be able to pay you. If they do, it may be a modest sum.
- Always ask for money! It never hurts. If none is available, reflect on how your writing is serving your professional goals within or outside of academia.



Compen\$ation From Self-Published Work

- If your podcast or video series becomes regular and you develop a following, you can think about monetizing!
 - Use crowdsourcing (e.g., Patreon allows your followers to make donations)
 - Ads & sponsorships



Self-Promotion

- Compile your work on a personal website or blog
- Cultivate your social media networks (e.g. Twitter, Facebook, Reddit, LinkedIn)
 - Follow other scientists in your field & science writers you admire
 - Engage with your community (e.g. reply, comment, like, retweet...)
 - Promote your articles (non-academica and non-academic!) via social media



Come Visit Us!

The **UCLA Graduate Writing Center** offers FREE appointments with friendly, experienced writing consultants to all registered UCLA graduate and professional school students. Meet with a graduate writing consultant to work on writing issues ranging from style and argumentation to grammar and syntax. Our goal is to help you become an effective writer in your field. ***Please keep in mind that the consultation appointments are interactive sessions, not proofreading sessions.*** Writing consultants are happy to help with grammatical issues, but they are not proofreaders or editors.

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