The Art of Crafting an Abstract (sort of. . .)

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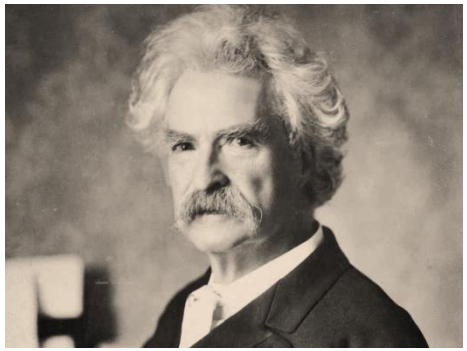
National Institute on Aging



“I didn't have time to write a short letter, so I wrote a long one instead.”

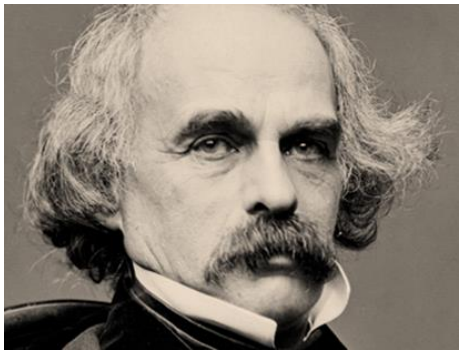
Mark Twain

“One day I will find the right words, and they will be simple.”

Jack Kerouac

“Ideas are like rabbits. You get a couple and learn how to handle them, and pretty soon you have a dozen.”

John Steinbeck



“Easy reading is damn hard writing.”

Nathaniel Hawthorne

Why the quality of your abstract is important? (1)

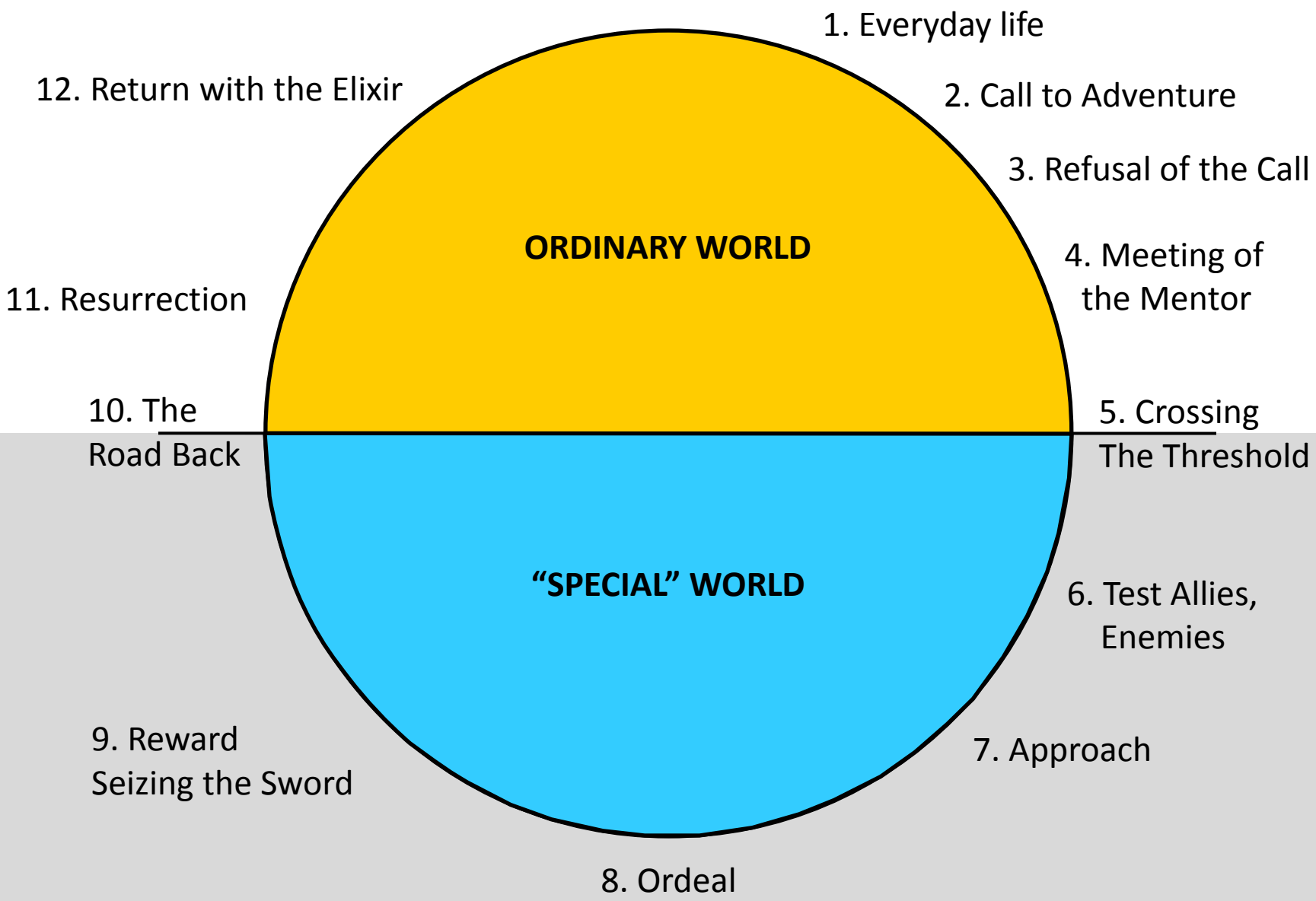
For each person reading your paper or hearing your presentation, 1000-fold more are reading your title and abstract. Thus, you should dedicate 1000-fold more time to title and abstract than to the rest of your paper/presentation.

Why the quality of your abstract is important? (2)

1. Editors read abstracts **before sending out papers for review**;
2. Reviewers read abstracts to get a **first impression about the quality** of a paper: this first approach shapes their attitude toward the paper;
3. Readers read abstracts to **decide whether to read the entire article**. Note: reading abstracts is free, while getting the article can be pretty expensive;
4. Conference organizers read abstracts to decide whether **to assign you a slot for a talk or poster**;
5. Conference participants read abstracts to decide whether **to come to your session or not**;
6. Scientists and clinicians read abstracts to **check the state of knowledge on a certain topic and understand who is doing research on it**;
7. Scientists writing papers read abstracts to **look for citations that support their theory/hypothesis/finding**;
8. Recently, words in abstracts are also used to **create "association" database for data mining**.

Write a story . . tell a story
People love stories, it's a fact, even scientists!

The Structure of a Story (Joseph Campbell)



Odyssey

- **Ordinary World** - the peaceful island of Ithaca
- **Call to Adventure** - Odysseus is summoned to join Agamemnon attack the city of Troy to retrieve the wife of Menelaus, Helen, after she is taken by Paris
- **Refusal of the Call** – the beautiful homeland and his newly born son
- **Crossing Threshold** - the Trojan War
- **Mentor** - Athena, Zeus bright-eyed goddess daughter
- **Tests, Allies, Enemies** - The journey home and encounters with Circe, Polyphemus, the sirens and other
- **Illusion** - Arrival home, more challenge (the bow)
- **Ordeal** - reunion with Penelope/Telemachus
- **Return with Elixir** - Restores peace and tranquility to his house and the King of Ithaca

- **Call to adventure** - Ben Kenobi asks Luke to help him answer Leia's call and defeat the empire
- **Refusal of the call** - Luke says he has to stay help with the harvest
- **Supernatural aid** - The Force
- **Crossing threshold** - Flying away from the planet to the center of the galaxy
- **Road of trials** - love for Leia, temptation from “dark side”
- **Atonement -** with the father and the apotheosis of becoming a Jedi etc. etc. etc.
- The **mentor** (Ben Kenobi), the **oracle** (Yoda)
- **Victory and coming home**

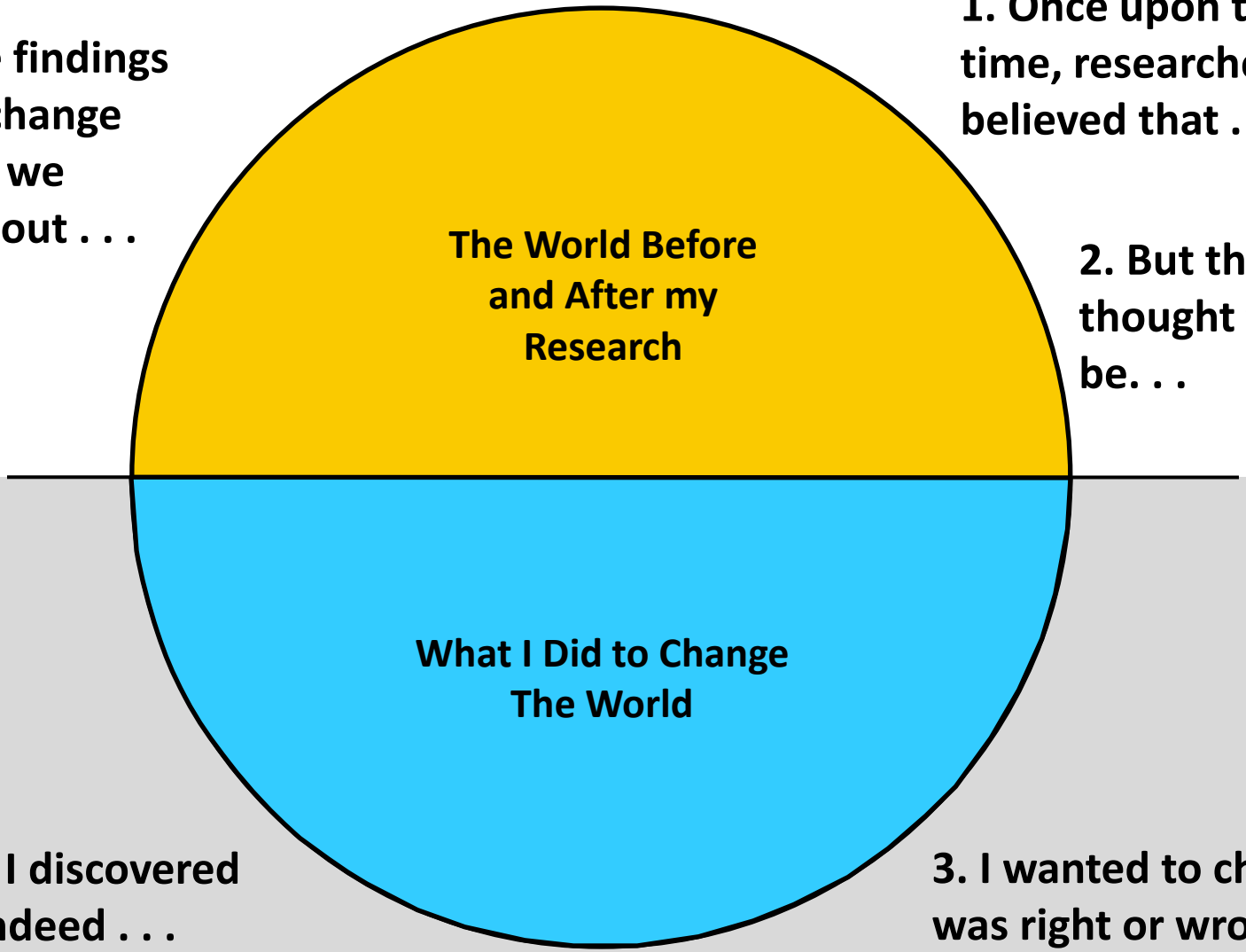

THE HOBBIT
AN UNEXPECTED JOURNEY


Pinocchio


Hercules


The Wizard of Oz

The Story in an Abstract (Luigi's version)



1. Once upon the time, researchers believed that . . .

2. But then I thought that may be. . .

3. I wanted to check if I was right or wrong and this is what I did . . .

4. And I discovered that, indeed . . .

5. These findings should change the way we think about . . .

Seriously? OK, this is what you do: think about putting stuff into the right drawers.

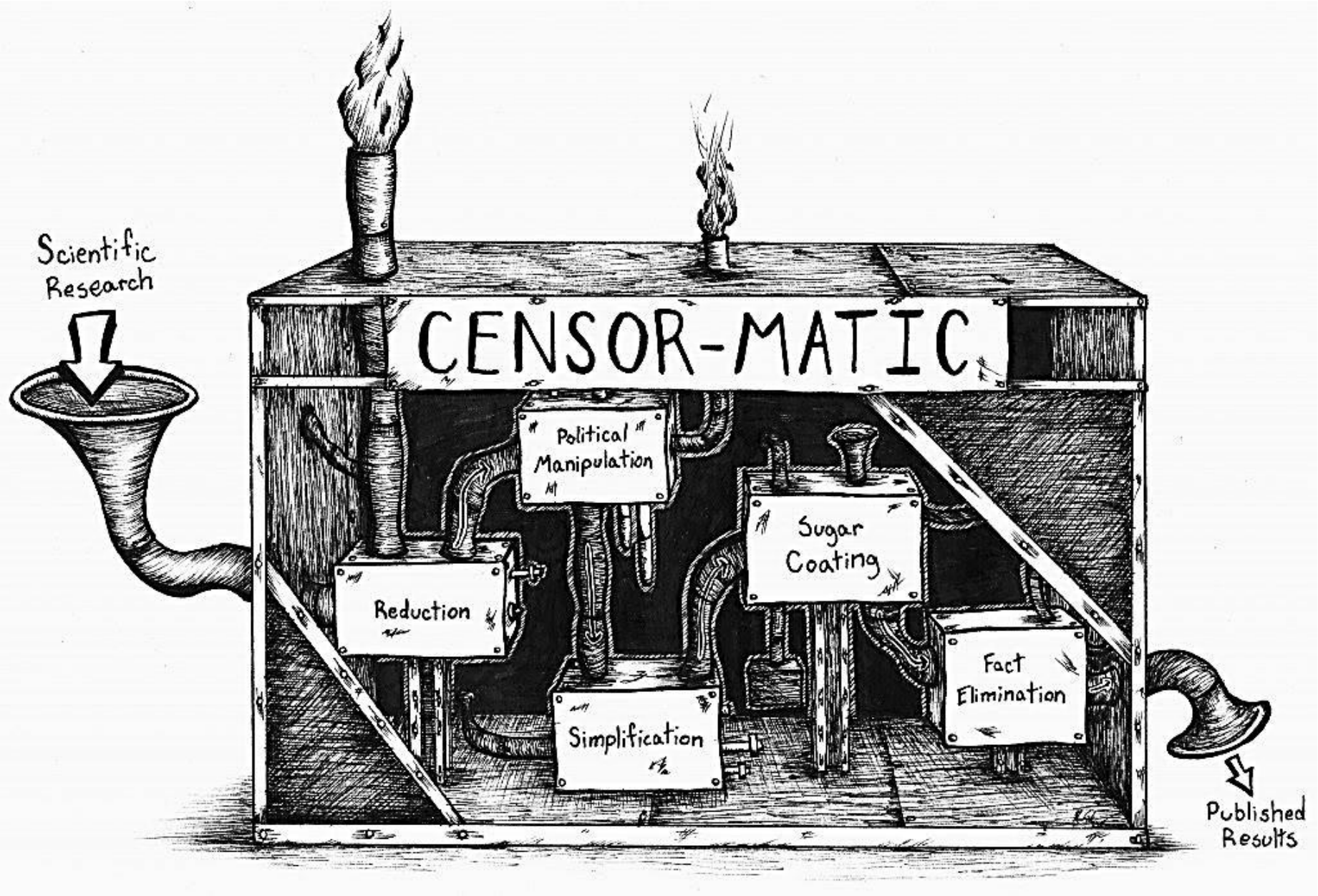
Introduction
Why did you decide to do this study?
Why is this research important?
What specific issue are you trying to better understand or solve?
What is your hypothesis?

Methods
Who are the subjects in your study?
What are the main variables that you collected?
How did you check reliability and validity of your measures?
How did you process and analyze your data?

Results
Describe your main results (give numbers and statistics)
Was your hypothesis or argument supported?
Any sensitivity analysis?

Discussion
Give your conclusion.
What are the implications of your work?
Are your results general or very specific?
What further research is needed?

Too Many Words can Get you in Trouble!
Start by Carefully Reading the "Instructions to Authors"



Where do I start?

- At first, don't be overly concerned about the length. Just make sure you include all the key information
- Then, take your draft and start crossing out words, phrases, and sentences that are less important
- Look for places where you can combine sentences in ways that shorten the total length
- Put it aside for a while, then come back and re-read, you'll probably find new places to cut
- Before you know it you will have a tightly written abstract.

Start by writing the main facts without thinking of length or counting words. **Revise early and OFTEN.**

1. Start by writing a draft focusing on section organization, connection between sections, and **equilibrium of length between different parts**. As a rule of thumb:
    1. Introduction 15%
    2. Methods 30%
    3. Results 40%
    4. Conclusions 15%
2. Eliminates words and sentences that are not essential. Use short but complete sentences. Avoid choppy, disconnected sentences (telegraphic sentences).
3. If you are within words limits, stop here, and send to co-authors.

Start by writing the main facts without thinking of length or counting words. **Revise early and OFTEN.**

1. **If the abstract is still too long**, you need to give up content! **It is better to reduce content than to sacrifice clarity.** Create a hierarchical order of priority between sentences.
   1. **Priority 1** - What we know, what gap we want to address; hypothesis; participants, main variable/s; results (with numbers and statistics); implications.
   2. **Priority 2** – Literature review; Statistical analysis; Secondary and sensitivity analyses; generalizability of findings.
   3. **Priority 3** – Drawbacks and advantages and any other additional information.

   Start by eliminating sentences with priority 3 and 2. Never (never ever) eliminate sentences with priority n. 1. If after eliminating sentences with priority 2 and 3 the abstract is still too long, **ask for help!**

Titles as a meta-abstracts, “abstracts of abstracts”

You should be able to describe your main findings with a sentence. **Try hard!** It is good exercise and help you get to the essential your research question. Write this sentence down, shorten a rearrange worlds to create an effective title.

Some scientists prefer “detective stories” title, i.e. titles that do not reveal the study findings, but . . .I don’t like them.

Titles as a meta-abstracts, “abstracts of abstracts”

For example:

This research demonstrates that repeated episodes of ischemia-reperfusion in patients with peripheral artery disease trigger intense and frequent muscle repair episodes that exhaust the proliferative potential of satellite cells.

Title

Assemblage: 1. Episodes of ischemia-reperfusion - 2. peripheral artery disease - 3. frequent muscle repair episodes – 4. proliferative potential of satellite cells.

Rearrangement: Ischemia-reperfusion in peripheral artery disease exhausts the repairing potential of satellite cells.

RULES

That (in my humble opinion) SHOULD NEVER BE BROKEN!!!!

- Avoid using "*This abstract reports. . .it is suggested that. . .it is believed that*." . . focus on the science.
- Avoid **jargon** at all costs. Write for intelligent readers not specialists;
- Write your abstract from scratch! **Do not "cut and paste".**
- Use **short, full sentences**, without removing articles of connections to save space.
- Avoid **abbreviations and acronyms**. . . they drive readers crazy.
- Use **key phrases and words**. You want appropriate queries on online databases to find your abstract or article.
- Try to use 5 important words or phrases key to your research in your abstract.
- Use real information. This is like "true in advertising". Citing material that it is not in your work will mislead readers and ultimately lower your viewership.

RULES

That (in my humble opinion) CAN BE BROKEN!!!!

- Tell a story
- For example, people say that you should not use tables, figure or references, but in some cases they can be fine!!!!
- Try not to repeat the words in the title; the title is part of the abstract, save words!!
- Modern scientific writing prefers the active voice, but you can use the passive voice if this approach requires less words. Generally, it is suggested that “I” or “We” should not be used, but I strongly disagree with this.
- Avoid "boilerplate sentences" which take up room and provide no real information (ex: "Policy implications are discussed" or "It is concluded that," etc.).

The 4 Cs for Abstracts

Complete it covers the major parts of the research

Concise it contains no excess wordiness or unnecessary information

Clear it is readable, well organized, and not contain too much jargon

Cohesive it flows smoothly between the parts.

And NOW

a couple of good abstracts, one very standard and one non-standard

Body-Mass Index and Mortality among Adults with Incident Type 2 Diabetes

Deirdre K. Tobias, Sc.D., An Pan, Ph.D., Chandra L. Jackson, Ph.D., Eilis J. O'Reilly, Sc.D., Eric L. Ding, Sc.D., Walter C. Willett, M.D., Dr.P.H., JoAnn E. Manson, M.D., Dr.P.H., and Frank B. Hu, M.D., Ph.D.

Background

The relation between body weight and mortality among persons with type 2 diabetes remains unresolved, with some studies suggesting decreased mortality among overweight or obese persons as compared with normal-weight persons (an “obesity paradox”).

Methods

We studied participants with incident diabetes from the Nurses' Health Study (8970 participants) and Health Professionals Follow-up Study (2457 participants) who were free of cardiovascular disease and cancer at the time of a diagnosis of diabetes. Body weight shortly before diagnosis and height were used to calculate the body-mass index (BMI, the weight in kilograms divided by the square of the height in meters). Multivariable Cox models were used to estimate the hazard ratios and 95% confidence intervals for mortality across BMI categories.

Results

There were 3083 deaths during a mean period of 15.8 years of follow-up. A J-shaped association was observed across BMI categories (18.5 to 22.4, 22.5 to 24.9 [reference], 25.0 to 27.4, 27.5 to 29.9, 30.0 to 34.9, and ≥35.0) for all-cause mortality (hazard ratio, 1.29 [95% confidence interval {CI}, 1.05 to 1.59]; 1.00; 1.12 [95% CI, 0.98 to 1.29]; 1.09 [95% CI, 0.94 to 1.26]; 1.24 [95% CI, 1.08 to 1.42]; and 1.33 [95% CI, 1.14 to 1.55], respectively). This relationship was linear among participants who had never smoked (hazard ratios across BMI categories: 1.12, 1.00, 1.16, 1.21, 1.36, and 1.56, respectively) but was nonlinear among participants who had ever smoked (hazard ratios across BMI categories: 1.32, 1.00, 1.09, 1.04, 1.14, and 1.21) (P=0.04 for interaction). A direct linear trend was observed among participants younger than 65 years of age at the time of a diabetes diagnosis but not among those 65 years of age or older at the time of diagnosis (P<0.001 for interaction).

Conclusions

We observed a J-shaped association between BMI and mortality among all participants and among those who had ever smoked and a direct linear relationship among those who had never smoked. We found no evidence of lower mortality among patients with diabetes who were overweight or obese at diagnosis, as compared with their normal-weight counterparts, or of an obesity paradox. (Funded by the National Institutes of Health and the American Diabetes Association.)

N Engl J Med 2014; 370:233-244

The effect of fall prevention exercise programmes on fall induced injuries in community dwelling older adults: systematic review and meta-analysis of randomised controlled trials.

Fabienne El-Khoury, PhD, Bernard Cassou, Marie-Aline Charles, Patricia Dargent-Molina.

Objective To determine whether, and to what extent, fall prevention exercise interventions for older community dwelling people are effective in preventing different types of fall related injuries.

Data sources Electronic databases (PubMed, the Cochrane Library, Embase, and CINAHL) and reference lists of included studies and relevant reviews from inception to July 2013.

Study selection Randomised controlled trials of fall prevention exercise interventions, targeting older (>60 years) community dwelling people and providing quantitative data on injurious falls, serious falls, or fall related fractures.

Data synthesis Based on a systematic review of the case definitions used in the selected studies, we grouped the definitions of injurious falls into more homogeneous categories to allow comparisons of results across studies and the pooling of data. For each study we extracted or calculated the rate ratio of injurious falls. Depending on the available data, a given study could contribute data relevant to one or more categories of injurious falls. A pooled rate ratio was estimated for each category of injurious falls based on random effects models.

Results 17 trials involving 4305 participants were eligible for meta-analysis. Four categories of falls were identified: all injurious falls, falls resulting in medical care, severe injurious falls, and falls resulting in fractures. Exercise had a significant effect in all categories, with pooled estimates of the rate ratios of 0.63 (95% confidence interval 0.51 to 0.77, 10 trials) for all injurious falls, 0.70 (0.54 to 0.92, 8 trials) for falls resulting in medical care, 0.57 (0.36 to 0.90, 7 trials) for severe injurious falls, and 0.39 (0.22 to 0.66, 6 trials) for falls resulting in fractures, but significant heterogeneity was observed between studies of all injurious falls ($I2=50\%$, $P=0.04$).

Conclusions Exercise programmes designed to prevent falls in older adults also seem to prevent injuries caused by falls, including the most severe ones. Such programmes also reduce the rate of falls leading to medical care.

And NOW

two problematic abstracts (the papers were fantastic)

Aerobic Exercise Plus Weight Loss Improves Insulin Sensitivity and Increases Skeletal Muscle Glycogen Synthase Activity in Older Men.

Author1, author2m author3. . .

The purpose of this study was to determine the effects of 6-month aerobic exercise training + weight loss (AEX + WL) on basal and insulin activation of glycogen synthase, basal citrate synthase activity, and Akt and AS160 phosphorylation in older, overweight/obese insulin-resistant men (n = 14; 63 ± 2 years; body mass index, 32 ± kg/m2). Muscle samples of the vastus lateralis were collected before and during a 3-hour 80 mU/m2/min hyperinsulinemic-euglycemic clamp. AEX + WL increased VO2max by 11% ($p < .05$) and decreased body weight (-9%, $p < .001$). AEX + WL increased basal citrate synthase activity by 46% ($p < .01$) and insulin activation of independent (2.9-fold) and fractional (2.3-fold) activities (both $p < .001$) of glycogen synthase. AEX + WL had no effect on phosphorylation of Akt or AS160. Glucose utilization (M) improved 25% ($p < .01$), and the change tended to be related to the increase in insulin activation of glycogen synthase fractional activity ($r = .50$, $p = .08$) following AEX + WL. In summary, AEX + WL has a robust effect on insulin activation of skeletal muscle glycogen synthase activity that likely contributes to improved glucose utilization in older insulin-resistant men.

KEYWORDS:
Exercise, Insulin sensitivity, Skeletal muscle glycogen synthase, Weight loss.

G Ital Cardiol. 1983;13(3):197-200.
[A case of postinfarction spontaneous angina: physiopathological study of the therapeutic effectiveness of intra-aortic balloon pumping]. [Article in Italian]

Ferrucci L, Greppi B, Calamandrei M, Conti A, De Alfieri W, Di Bari M, Pini R, Vannucci A, Vassanelli C, Marchionni N.

A 46-year-old patient showed spontaneous angina with anterior S-T segment depression 30 hours after an inferior acute myocardial infarction. Myocardial ischemia, which was resistant to drug therapy and induced acute left ventricular failure, was promptly reversed by intra-aortic balloon pumping (IABP). Coronary angiography demonstrated diffuse, severe atherosclerotic disease. Efficacy of IABP in this case of spontaneous angina might be ascribed to an increase of the coronary cross-sectional area in response to the increased intraluminal pressure ("passive vasomotion").

Finally!!!!

my Absolutely Favored Abstracts

IOP FTC

IOP Publishing — Journal of Physics A: Mathematical and Theoretical

J. Phys. A: Math. Theor. **44** (2011) 492001 (5pp) doi:10.1088/1751-8113/44/49/492001

FAST TRACK COMMUNICATION

Can apparent superluminal neutrino speeds be explained as a quantum weak measurement?

M V Berry[1], N Brunner[1], S Popescu[1] and P Shukla[2]

[1] H H Wills Physics Laboratory, Tyndall Avenue, Bristol BS8 1TL, UK
[2] Department of Physics, Indian Institute of Technology, Kharagpur, India

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Online at stacks.iop.org/JPhysA/44/492001

Abstract
Probably not.

PACS numbers: 03.65.Ta, 03.65.Xp, 14.60.Pq

If recent measurements [1] suggesting that neutrinos travel faster than light survive scrutiny, the question of their theoretical interpretation will arise. Here we discuss the possibility that the apparent superluminality is a quantum interference effect, that can be interpreted as a weak measurement [2–5]. Although the available numbers strongly indicate that this explanation is not correct, we consider the idea worth exploring and reporting—also because it might

This abstract was in AGU meeting from the early ’90s. I wonder if this is commentary about the late ’80s/early ’90s fractal craze, or simply some scientists having a bit of fun with their peers. Either way, I love it.

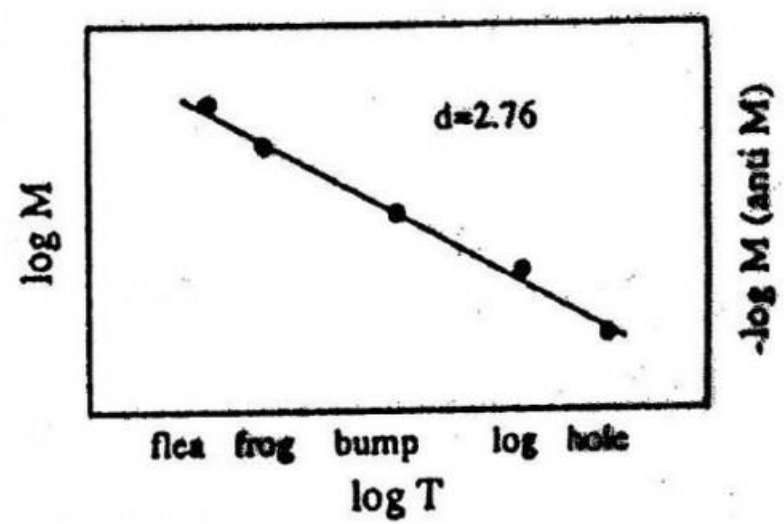
This abstract is indeed authentic: 1991 EOS Trans. AGU Vol 72, No 27-53, p456

T22B-1º 1330h POSTER

Fractal Analysis of Deep Sea Topography

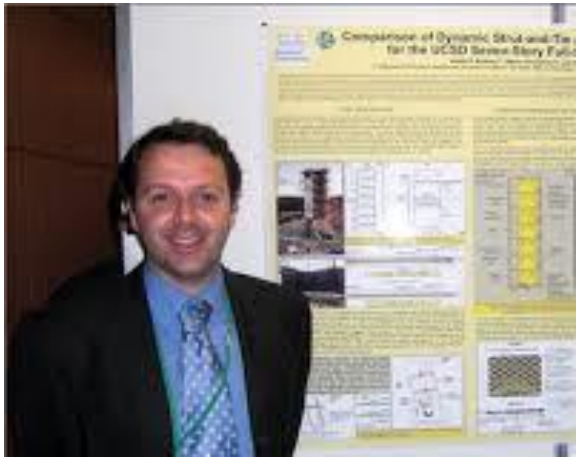
Marc Spiegelman and Chris Scholz (Lamont-Doherty Geological Observatory, Palisades, NY 10964; 914-359-2900)

Recent high resolution mapping of deep-sea topography shows clearly that there's a hole in the bottom of the sea. To repeat, there's a hole in the bottom of the sea. There's a hole—there's a hole—there's a hole in the bottom of the sea. Moreover, more careful analysis indicates that there is a multitude of scale lengths in the bathymetric data. For instance, there's a log in the hole in the bottom of the sea. There's a bump on the log in the hole in the bottom of the sea. There's a frog on the bump on the log in the hole in the bottom of the sea. And there's a flea on a frog on a bump on a log in a hole in the bottom of the sea. There's a flea—there's a frog—there's a hole in the bottom of the sea. Figure 1 shows the 5 orders of magnitude inherent in the data plotted in log-log space and indicates a fractal dimension $d = 2.76$. Plotting in log-frog space gives $d = 2.5$. No attempt has been made to understand this result.



From Abstract to Poster

- Communicates visually your research
  - A compromise between slides and a manuscript
  - A painting in a museum
  - Invite people to stop
  - Make it for you to explain
- Attracts & holds attention
  - **Aim for 300-500 words (max 5 min).**
  - Initiates discussion
  - Summarize your finding in one sentence
  - Focus on hypothesis, results, implications
- Visual Organization is key
  - Start with positioning figures and tables
- Information on how to find you!



A Visual Organization of Your Story

Title – Authors – Institution - Email

Use this space for
Background
Hypothesis
Methods (little)

Central Focus
A painting in a museum
Main results
Most beautiful picture
Looking at this picture and reading its caption should provide you 80% of the message

Figure Legend

More Results

Results

Summary of the results and clinical and research implications

A Check List

- ✓ Visually attractive (empty spaces)
- ✓ Concise title
- ✓ A single message
- ✓ Use large fonts (4-10 feet rule)
- ✓ Not more than 300-500 words
- ✓ Main results in the center
- ✓ At least one figure/table
- ✓ A clear hypothesis
- ✓ You can explain it in 3 min or less

Tips for Designing Effective Presentations

A poster with the main title in 1 ½ “ font

Developed by Luigi Ferrucci (ferruccilu@mail.nih.gov)

Get the audience’s attention by communicating your hypothesis quickly and succinctly

Little space for methods if any at all

Describe your great finding here

Continue with your findings here. Less is more. Shorten your text and enlarge your font.

Conclusions and clinical implications here. You should get here in less than 1 minute. The benchmark is having people reading this part. If they do. .Celebrate!

Questions?