

Reviewing research outputs

Research outputs – A world of possibilities

I – Research outputs review	II – Fun time: Tweet a study	III - Discussion
<ol style="list-style-type: none">1. Different types of outputs2. Media coverage3. Scientific journal articles	<ol style="list-style-type: none">1. Read a study2. Write a tweet3. Vote for the best tweet	<p>You are in charge of this part, I didn't prepare anything.</p>

Research outputs – A world of possibilities

I – Research outputs review		
1. Different types of outputs		

Research outputs – A world of possibilities



Different types of outputs

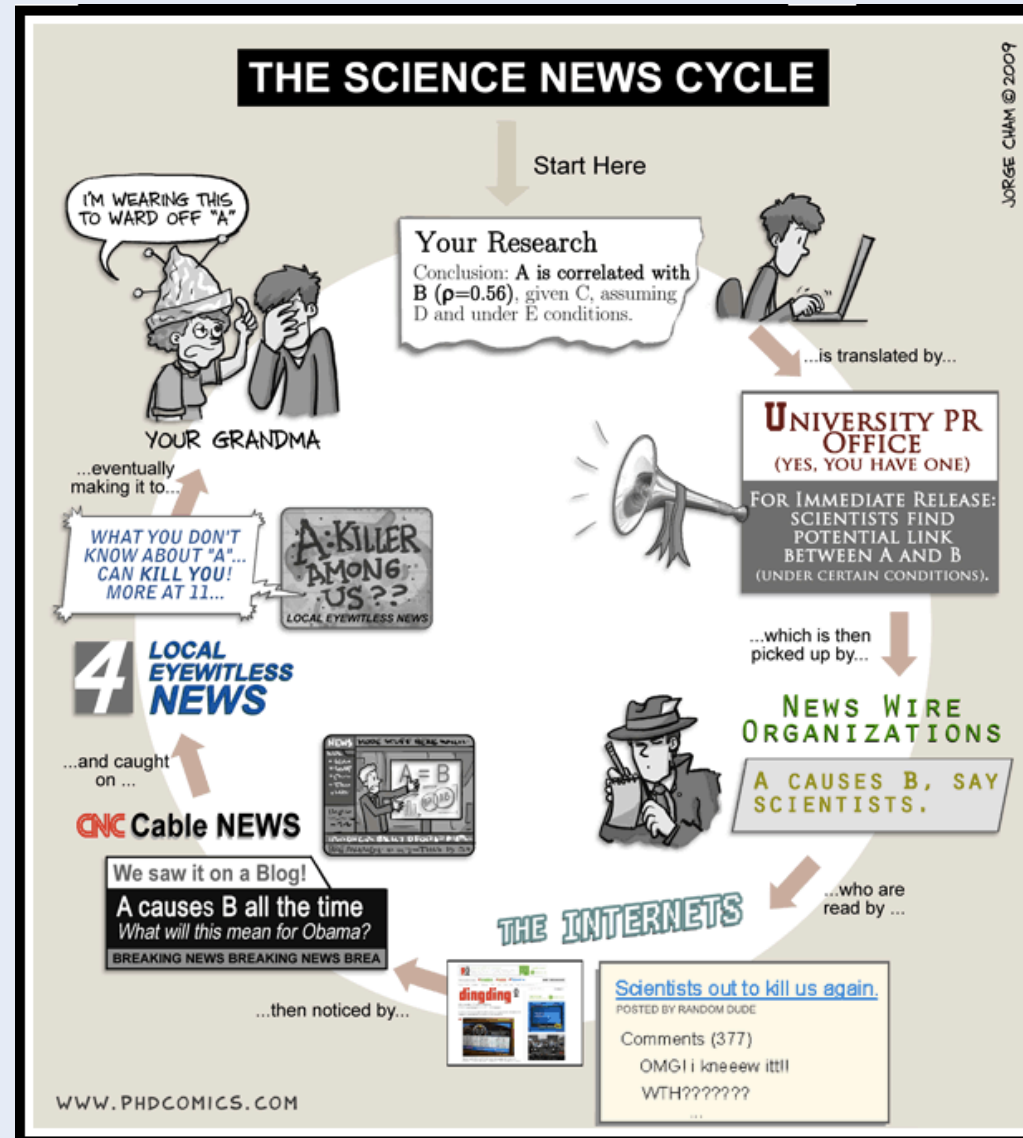
For fellow academics	For stakeholders	For the real world
<ul style="list-style-type: none">- Journal articles- Posters- Talks	<ul style="list-style-type: none">- Posters- Talks- Reports / Policy briefs / Guidelines- Website- Product / patent	<ul style="list-style-type: none">- Talks- Books- Website- Creative works- Media coverage

For nobody
<ul style="list-style-type: none">- PhD thesis

Research outputs – A world of possibilities

I – Research outputs review		
1. Different types of outputs 2. Media coverage		

Click-bait & sensational science – Media coverage



Click-bait & sensational science – Media coverage

Oral Concurrent Session 3
Thursday, February 6, 2008 • 1:00 PM • 400 PM • Hilton Atlantic • Grand Ballroom East

HYPERTENSION AND MEDICAL COMPLICATIONS
Abstracts 31-41
Moderator: Susan Ruffolo, MD, Brown Hospital, RI

32 High-flavanol chocolate to improve placental function and to decrease the risk of preeclampsia: a double blind randomized clinical trial
Emmanuel Bujold¹, Asma Babar², Elise Lavoie¹, Mario Girard², Vicky Leblanc¹, Simone Lemieux¹, Lionel-Ange Pongui¹, Isabelle Marc¹, Belkacem Abdous¹, Sylvie Dodin¹
¹Université Laval, Québec City, QC, Canada; ²Centre de recherche du CHU de Québec, Québec City, QC, Canada

OBJECTIVE: Previous studies showed conflicting results regarding the role of chocolate consumption during pregnancy and the risk of preeclampsia. We aimed to evaluate the impact of high-flavanol chocolate in a randomized clinical trial.

STUDY DESIGN: We conducted a single-center randomized controlled trial including women with singleton pregnancy between 11 and 14 weeks gestation who had double-notching on uterine artery Doppler. The pregnant women selected were randomized to either high-

Figure 1: Uterine Artery Pulsatility Index in Pregnant Women after Randomized Treatment

Treatment Group	UaA PI (Mean ± SD)
HFC	1.4 ± 0.4
LFC	1.4 ± 0.4

Oral Concurrent Session 3 • HYPERTENSION AND MEDICAL COMPLICATIONS

flavanol (HFC) or low-flavanol chocolate (LFC). A total of 30 g of chocolate was consumed daily for 12 weeks and women were followed until delivery. Uterine artery Doppler pulsatility index (UaA PI), reported as multiple of medians (MoM) adjusted for gestational age, was assessed at baseline and 12 weeks after randomization. Preeclampsia, gestational hypertension, placenta weight, and birthweight were also evaluated.

RESULTS: One hundred twenty nine women were randomized at a mean gestational age of 12.4 ± 0.6 weeks with a mean UaA PI of 1.4 ± 0.4 MoM. Although adjusted UaA PI significantly decreased from baseline to 12 weeks in the 2 groups ($p < 0.0001$), the difference between the 2 groups was not significant ($p = 0.16$). At 12 weeks, we observed no significant difference between HFC and LFC groups in the rate of preeclampsia (4.7% vs 3.1%, $p = 0.49$) and gestational hypertension (6.2% vs 12.5%, $p = 0.56$). Placental weight (466 vs 464 grams, $p = 0.93$) and birthweight (3348 vs 3215 grams, $p = 0.07$) were comparable between the two groups.

CONCLUSION: Compared with low-flavanol chocolate, daily intake of 30g of high-flavanol chocolate did not improve placental function, placental weight and the risk of preeclampsia. Nevertheless, the marked improvement of the pulsatility index observed in the 2 chocolate groups might suggest that chocolate effects are not solely and directly due to flavanol content.

Click-bait & sensational science – Media coverage

- Objective

Previous studies showed conflicting results regarding the role of chocolate consumption during pregnancy and the risk of preeclampsia. We aimed to evaluate the impact of high-flavanol chocolate in a randomized clinical trial.

- Study Design

We conducted a single-center randomized controlled trial including women with singleton pregnancy between 11 and 14 weeks gestation who had double-notching on uterine artery Doppler. The pregnant women selected were randomized to either high-flavanol (HFC) or low-flavanol chocolate (LFC). A total of 30 g of chocolate was consumed daily for 12 weeks and women were followed until delivery. Uterine artery Doppler pulsatility index (UtA PI), reported as multiple of medians (MoM) adjusted for gestational age, was assessed at baseline and 12 weeks after randomization. Preeclampsia, gestational hypertension, placenta weight, and birthweight were also evaluated.

- Results

One hundred twenty nine women were randomized at a mean gestational age of 12.4 ± 0.6 weeks with a mean UtA PI of 1.4 ± 0.4 MoM. Although adjusted UtA PI significantly decreased from baseline to 12 weeks in the 2 groups (<0.0001), the difference between the 2 groups was not significant ($p=0.16$). At 12 weeks, we observed no significant difference between HFC and LFC groups in the rate of preeclampsia (4.7% vs 3.1%, $p=0.49$) and gestational hypertension (6.2% vs 12.5%, $p=0.56$). Placental weight (466 vs 464 grams, $p=0.93$) and birthweight (3348 vs 3215 grams, $p=0.07$) were comparable between the two groups.

- Conclusion

Compared with low-flavanol chocolate, daily intake of 30g of high-flavanol chocolate did not improve placental function, placental weight and the risk of preeclampsia. Nevertheless, the marked improvement of the pulsatility index observed in the 2 chocolate groups might suggest that chocolate effects are not solely and directly due to flavanol content.

Click

Science News

from research organizations

The benefits of chocolate during pregnancy

Date: February 1, 2016

Source: Society for Maternal-Fetal Medicine

Summary: Researchers will present findings from a study titled, 'High-flavanol chocolate to improve placental function and to decrease the risk of preeclampsia: a double blind randomized clinical trial.'

Share:     

FULL STORY

In a study to be presented on Feb. 4 at the Society for Maternal-Fetal Medicine's annual meeting, The Pregnancy Meeting™, in Atlanta, researchers will present findings from a study titled, High-flavanol chocolate to improve placental function and to decrease the risk of preeclampsia: a double blind randomized clinical trial.

In light of previous studies showing conflicting results regarding the role of chocolate consumption during pregnancy and the risk of preeclampsia, this study set out to evaluate the impact of high-flavanol chocolate. Researchers conducted a single-center randomized controlled trial of 129 women with singleton pregnancy between 11 and 14 weeks gestation who had double-notching on uterine artery Doppler. The pregnant women selected were randomized to either high-flavanol or low-flavanol chocolate. A total of 30 grams of chocolate was consumed daily for 12 weeks and

science – Media coverage

women were followed until delivery. Uterine artery Doppler pulsatility index was at baseline and 12 weeks after randomization. Preeclampsia, gestational hypertension, placenta weight, and birthweight were also evaluated.

The result was that there was no difference in preeclampsia, gestational hypertension, placental weight or birthweight in the two groups; however, the uterine artery Doppler pulsatility index (a surrogate marker of blood velocity in the uterine, placental and fetal circulations) in both groups showed marked improvement that was much greater than expected in general population.

"This study indicates that chocolate could have a positive impact on placenta and fetal growth and development and that chocolate's effects are not solely and directly due to flavanol content," explained Emmanuel Bujold, M.D., one of the researchers on the study who will present the findings. Dr. Bujold and Dr. Sylvie Dodin, principal investigator of the trial, are with the Université Laval Québec City, Canada.

Story Source:

Materials provided by **Society for Maternal-Fetal Medicine**. Note: Content may be edited for style and length.

Click-bait & sensational science – Media coverage



Video: https://www.youtube.com/watch?v=0Rnq1NpHdmw&has_verified=1 (5:37 - 6:37)

Click-bait & sensational science – Media coverage

• Judging the quality of a media report

- > Clear account-> Informative-> Increased general understanding of the world
- > Poor account-> Climate change deniers, Anti-vaxxers-> Disaster



Click-bait & sensational science – Media coverage

- Is there a link to the actual study?
- Do we know what species the study used?
- Was the sample representative?
- Do we know the exact manipulation?
- Do we know what are the remaining steps to cover before being sure this can be generalized?
- Were there some conflict of interest?

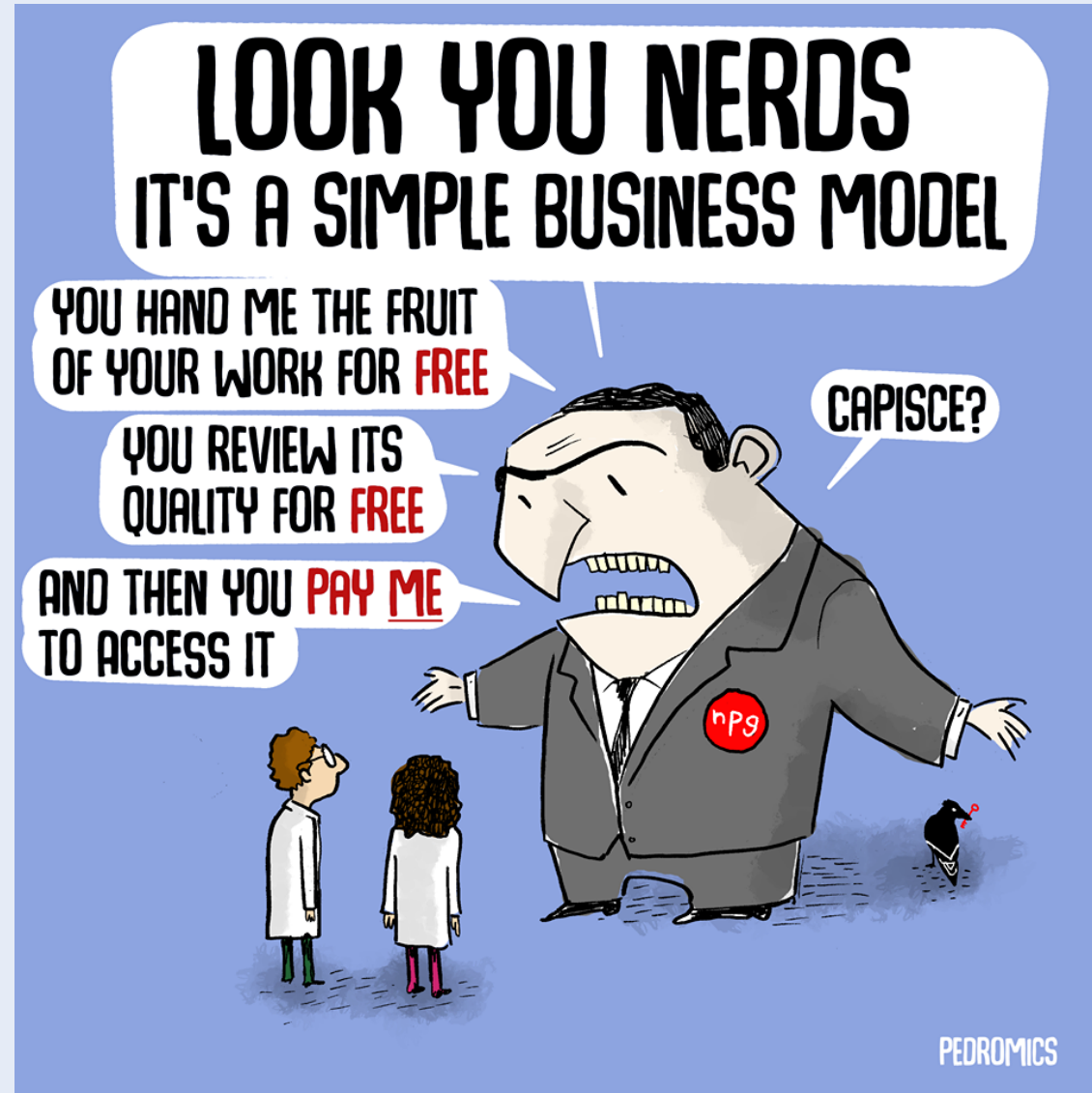
Click-bait & sensational science – Media coverage

Unsupported conclusions	Bad Science Bingo		Non-peer reviewed material
Sensationalised headlines	Correlation & Causation	Unrepresentative samples	Cherry-picked results
Misinterpreted results	Speculative language	No control group used	Unreplicable results
Conflicts of interests	Sample size too small	No blind testing used	Journals & Citations

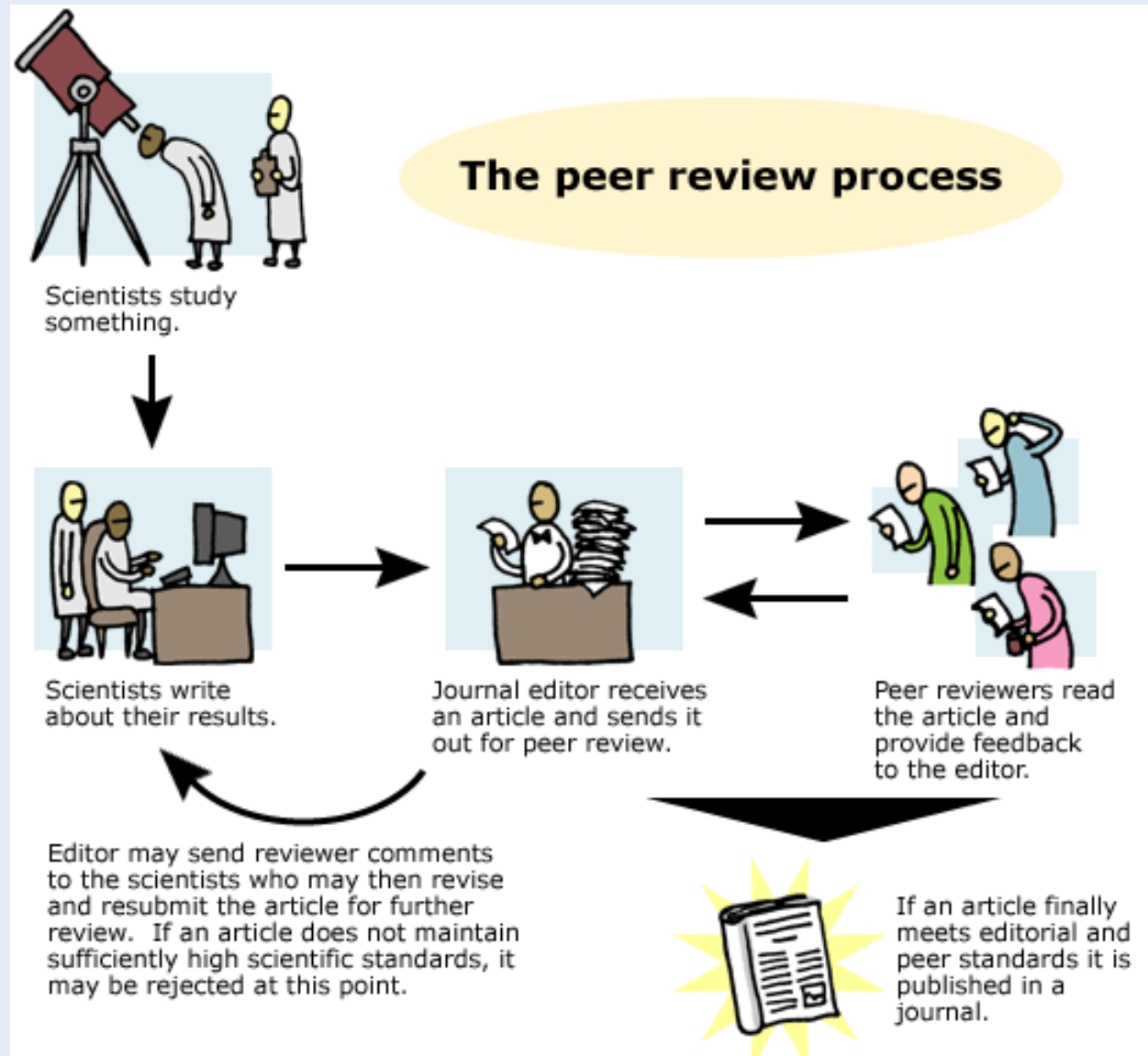
Research outputs – A world of possibilities

I – Research outputs review		
1. Different types of outputs		
2. Media coverage		
3. Scientific journal articles		

The one that rule them all – Journal article



The one that rule them all – Journal article



The one that rule them all – Journal article

- Structure

Abstract	Introduction	Material & Methods	Results	Discussion	References
Summary	<ul style="list-style-type: none">- Set the scene- Justify the research question (RQ)- Give RQ + hypothesis	<ul style="list-style-type: none">- What was done to answer the RQ	<ul style="list-style-type: none">- What was found, objectively reported	<ul style="list-style-type: none">- What the results mean- How they answer the RQ- How this fits into what we knew at the beginning- What went well, what went less well (and could mean the whole thing is pointless)- Implication + what should be done next	<ul style="list-style-type: none">- All the other journal articles cited

The one that rule them all – Journal article

- Checklist

- ☐ What was the research question? -> Introduction
- ☐ Why does it matter? -> Introduction
- ☐ What was done to answer the question? -> Methods
- ☐ What was found? -> Results
- ☐ What does it mean
 - ☐ For the research question? -> Discussion
 - ☐ For the field? -> Discussion
- ☐ What was done well? -> Methods, Results, Discussion
- ☐ What was not done well / could be improved ? -> Methods, Results, Discussion

The one that rule them all – Journal article

- Structure

Abstract	What you should do
- The teaser	Don't read only the abstract



The one that rule them all – Journal article

- Structure

Introduction	What you should do
<ul style="list-style-type: none">- Set the scene- Justify the research question (RQ)- Give RQ + hypothesis	<ul style="list-style-type: none">- Identify the RQ- Check that the RQ makes sense based on what we know

The one that rule them all – Journal article

- Structure

Material & Methods	What you should do
<ul style="list-style-type: none">- What was done to answer the RQ	<ul style="list-style-type: none">- Was the method appropriate to answer the question?- Is this method clear enough to be repeated and reproduced?- Did they make sure they had all the necessary controls in place?- What are the factors that could affect the results?

The one that rule them all – Journal article

- Structure

Results	What you should do
<ul style="list-style-type: none">- What was found, objectively reported	<p>This is the real deal. The real untouched results.</p> <ul style="list-style-type: none">- As much as possible try and understand how they answer the question without the opinion of the researcher

The one that rule them all – Journal article

- Structure

Discussion	What you should do
<ul style="list-style-type: none">- What the results mean- How they answer the RQ - How this fits into what we knew at the beginning- What went well, what went less well (and could mean the whole thing is pointless)- Implication + what should be done next	<ul style="list-style-type: none">- Do they reach the same conclusion as you with the results?- Do they acknowledge all the mistakes they've made?- Identify the next step.

The one that rule them all – Journal article

- Structure

References	What you should do
- All the other journal articles cited	If Paper A cites a Paper B that seems intriguing, don't just trust what Paper A says Paper B found, go and look at Paper B yourself.

The one that rule them all – Journal article

- Checklist

- ☐ What was the research question? -> Introduction
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- ☐ What was not done well / could be improved ? -> Methods, Results, Discussion

The one that rule them all – Journal article

- Judging the quality of a study

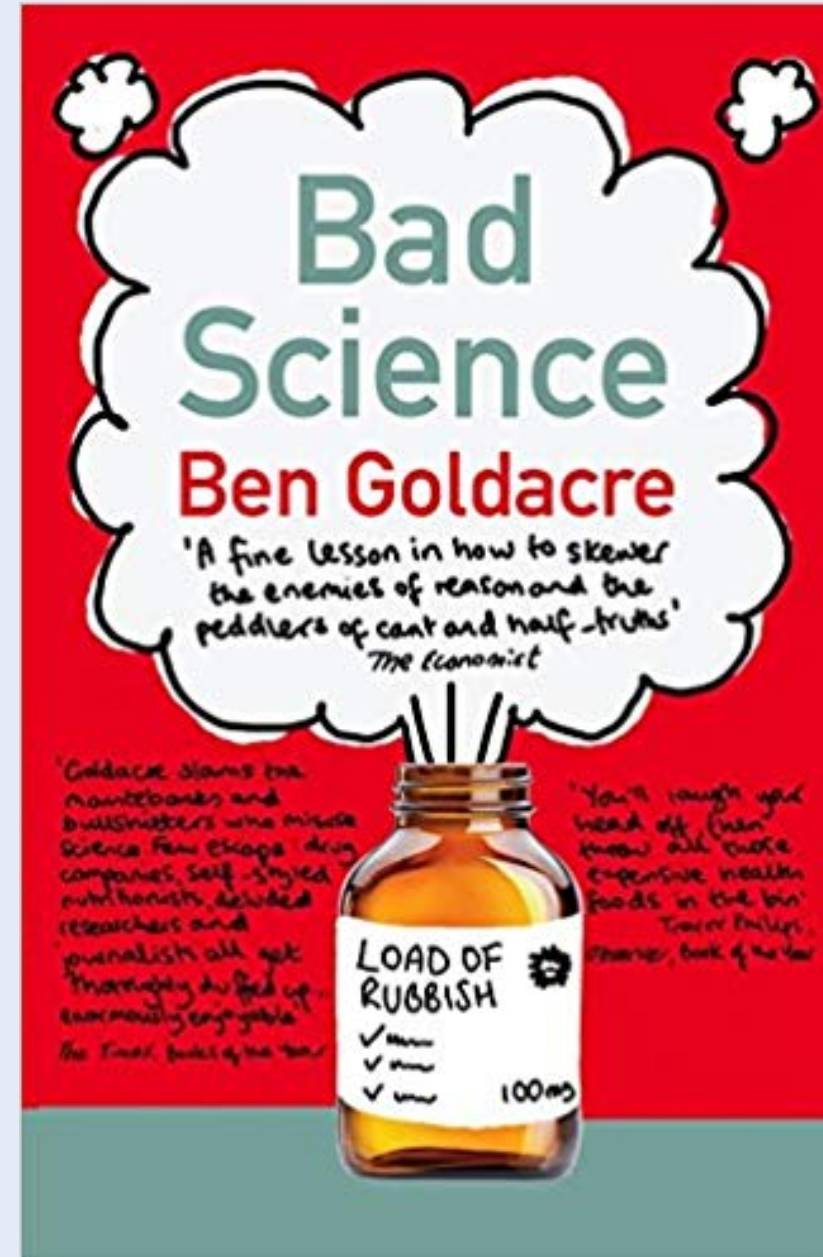
-> Good method -> reliable findings -> strong foundation for future research / policies / practices

-> Poor method -> weak findings -> ... -> disaster (Wakefield)

What was not done well / could be improved ?		
Methods	Results	Discussion
<ul style="list-style-type: none">- Task does not fit the question- No controls	<ul style="list-style-type: none">- Statistics does not fit the task / question- P-hacking	<ul style="list-style-type: none">- Results over-interpreted- Hides own limitations- Hides conflict of interest- Oddly validating results

Want more?

- Bad Science – Ben Goldacre
- John Oliver's Scientific Studies



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Hands on!

- Activity time

1. Read the paper (focus on Study 1)

2. Create a tweet

3. Vote for the best tweet

4. Discuss the tweets













A Rough Guide to
SPOTTING BAD SCIENCE

Being able to evaluate the evidence behind a scientific claim is important. Being able to recognise bad science reporting, or faults in scientific studies, is equally important. These 12 points will help you separate the science from the pseudoscience.

1. SENSATIONALISED HEADLINES  Article headlines are commonly designed to entice viewers into clicking on and reading the article. At times, they can over-simplify the findings of scientific research. At worst, they sensationalise and misrepresent them.	7. UNREPRESENTATIVE SAMPLES USED  In human trials, subjects are selected that are representative of a larger population. If the sample is different from the population as a whole, then the conclusions from the trial may be biased towards a particular outcome.
2. MISINTERPRETED RESULTS  News articles can distort or misinterpret the findings of research for the sake of a good story, whether intentionally or otherwise. If possible, try to read the original research, rather than relying on the article based on it for information.	8. NO CONTROL GROUP USED  In clinical trials, results from test subjects should be compared to a 'control group' not given the substance being tested. Groups should also be allocated randomly. In general experiments, a control test should be used where all variables are controlled.
3. CONFLICTS OF INTEREST  Many companies will employ scientists to carry out and publish research - whilst this doesn't necessarily invalidate the research, it should be analysed with this in mind. Research can also be misrepresented for personal or financial gain.	9. NO BLIND TESTING USED  To try and prevent bias, subjects should not know if they are in the test or the control group. In 'double blind' testing, even researchers don't know which group subjects are in until after testing. Note, blind testing isn't always feasible, or ethical.
4. CORRELATION & CAUSATION  Be wary of any confusion of correlation and causation. A correlation between variables doesn't always mean one causes the other. Global warming increased since the 1800s, and pirate numbers decreased, but lack of pirates doesn't cause global warming.	10. SELECTIVE REPORTING OF DATA  Also known as 'cherry picking', this involves selecting data from results which supports the conclusion of the research, whilst ignoring those that do not. If a research paper draws conclusions from a selection of its results, not all, it may be guilty of this.
5. UNSUPPORTED CONCLUSIONS  Speculation can often help to drive science forward. However, studies should be clear on the facts their study proves, and which conclusions are as yet unsupported ones. A statement framed by speculative language may require further evidence to confirm.	11. UNREPLICABLE RESULTS  Results should be replicable by independent research, and tested over a wide range of conditions (where possible) to ensure they are consistent. Extraordinary claims require extraordinary evidence - that is, much more than one independent study!
6. PROBLEMS WITH SAMPLE SIZE  In trials, the smaller a sample size, the lower the confidence in the results from that sample. Conclusions drawn can still be valid, and in some cases small samples are unavoidable, but larger samples often give more representative results.	12. NON-PEER REVIEWED MATERIAL  Peer review is an important part of the scientific process. Other scientists appraise and critique studies, before publication in a journal. Research that has not gone through this process is not as reputable, and may be flawed.

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5. SPECULATIVE LANGUAGE  Speculations from research are just that - speculation. Be on the look out for words such as 'may', 'could', 'might', and others, as it is unlikely the research provides hard evidence for any conclusions they precede.	11. UNREPLICABLE RESULTS  Results should be replicable by independent research, and tested over a wide range of conditions (where possible) to ensure they are generalisable. Extraordinary claims require extraordinary evidence - that is, much more than one independent study!
6. SAMPLE SIZE TOO SMALL  In trials, the smaller a sample size, the lower the confidence in the results from that sample. Conclusions drawn should be considered with this in mind, though in some cases small samples are unavoidable. It may be cause for suspicion if a large sample was possible but avoided.	12. JOURNALS & CITATIONS  Research published to major journals will have undergone a review process, but can still be flawed, so should still be evaluated with these points in mind. Similarly, large numbers of citations do not always indicate that research is highly regarded.

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Hands on!

- Discussion

Thoughts? Questions?

Extra resources

- <https://www.elsevier.com/connect/infographic-how-to-read-a-scientific-paper>
- <https://www.youtube.com/watch?v=AsD9Lp-q45Y>
- <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0085355>

The end

Thank you!
I hope you had a nice time!