Interpreting Nutrition Research: Separating Fact from Fiction

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Who Am I?

Bachelor of Science in Dietetics, University of Delaware Class of 2016

Master of Science in Human Nutrition, University of Delaware Class of 2018

I've been an RD since 2019, and a personal trainer (NASM-CPT) since 2020

I currently run an insurance-based, telehealth private practice full-time

I also do research for Examine.com - a health and nutrition research company

I create evidence-based nutrition-related content on IG, @powerlifterdietitian

Learning Objectives

After completing this lecture, participants will be able to:

- Define each component of a research paper and its relevance
- Describe three practical steps to reading nutrition literature more critically
- Identify three methods to respectfully disagree with another individual with regard to nutrition research findings

But WHY should I bother reading research?

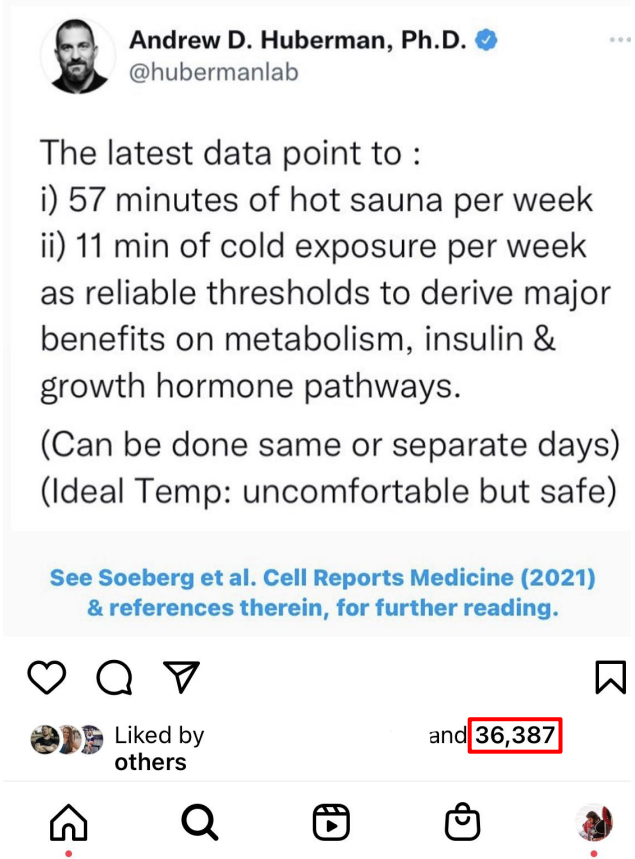
You might be thinking…

“It’s boring and dry!”

“I already know what I need to know!”

“Reading research is like reading a foreign language.”

“I don’t have the time to read research.”


Andrew D. Huberman, Ph.D.
@hubermanlab
The latest data point to :
i) 57 minutes of hot sauna per week
ii) 11 min of cold exposure per week
as reliable thresholds to derive major benefits on metabolism, insulin & growth hormone pathways.
(Can be done same or separate days)
(Ideal Temp: uncomfortable but safe)
See Soeberg et al. Cell Reports Medicine (2021) & references therein, for further reading.
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Let's Look at the ACTUAL Study!

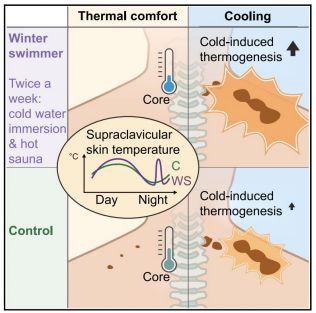
PMID:34755128

Cell Reports
Medicine

Article

Altered brown fat thermoregulation and enhanced cold-induced thermogenesis in young, healthy, winter-swimming men

Graphical abstract



Authors

Susanna Søberg, Johan Löfgren, Frederik E. Philipsen, ..., Bente K. Pedersen, Kristian Karstoft, Camilla Scheele

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In brief

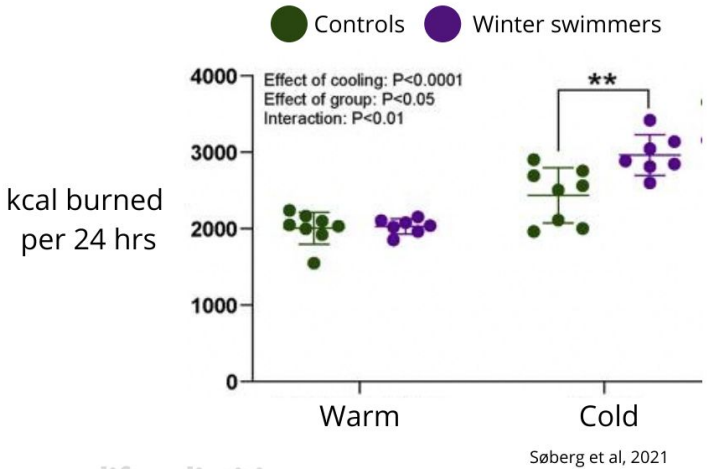
Søberg et al. find that winter-swimming men, combining cold-water immersion with hot sauna, burn more calories during cooling than controls, despite similar activation of brown fat. The authors propose a lower thermal set point in winter swimmers, reflected by lower core temperature and inactive brown fat at a thermal comfort state.

Highlights

- Winter swimmers have a lower core temperature at a thermal comfort state than controls
- Winter swimmers had no BAT glucose uptake at a thermal comfort state
- Winter swimmers have higher cold-induced thermogenesis than control subjects
- Human supraclavicular skin temperature varies with a diurnal rhythm

PMID:34755128

Subject characterization	Winter swimmers (n = 7)	Control group (n = 8)	p
Age (years)	25 (2.5)	23.6 (2.0)	0.25
Weight (kg)	76.7	78.9	0.55
Physical training/week (h)	7	6	0.32
Vegetarian (n)	1	1	–
BMI (kg/m^2)	23.7 (4.8)	23.3 (1.8)	0.87
VO_2max (mL O_2/kg/min)	53.1 (4.8)	51.2 (6.0)	0.50
Fasting plasma insulin (pmol/L)	37 (15.5)	33 (11.4)	0.60
Fasting plasma glucose (mmol/L)	4.6 (0.3)	4.5 (0.5)	0.58
Total cholesterol (mmol/L)	4.3 (0.9)	4.0 (0.4)	0.48
HDL cholesterol (mmol/L)	1.5 (0.4)	1.4 (0.2)	0.53
LDL cholesterol (mmol/L)	2.7 (0.9)	2.5 (0.5)	0.57
Tissue fat (%)	12.0 (4.6)	18.2 (4.3)	0.01
Gynoid fat (%)	16.6 (6.1)	23.3 (5.4)	0.03
Android fat (%)	16.8 (8.7)	23.3 (6.9)	0.12
Resting energy expenditure thermal comfort state (kcal/24 h)	2,038 (96.0)	2,005 (209.6)	0.69
Resting energy expenditure during 30 min cooling (kcal/24 h)	3,044 (337.2)	2,560 (348.1)	0.01
Winter swimming			
Winter-swimming seasons in total	1.8 (0.9)	–	–
Total swims last month	10.6 (3.3)	–	–
Swims/week the last month before experiments	2.6 (0.1)	–	–
Number of immersions/visit	2.6 (0.8)	–	–
Time in water/immersion (min)	1.4 (2.6)	–	–
Sauna users (yes/no)	(7/1)	–	–
Number of sauna visits/visit	2	–	–
Time in sauna/visit (min)	11.1 (14.3)	–	–
Total time immersed in cold water/week (min)	11	–	–
Total time in sauna heat/week (min)	57	–	–

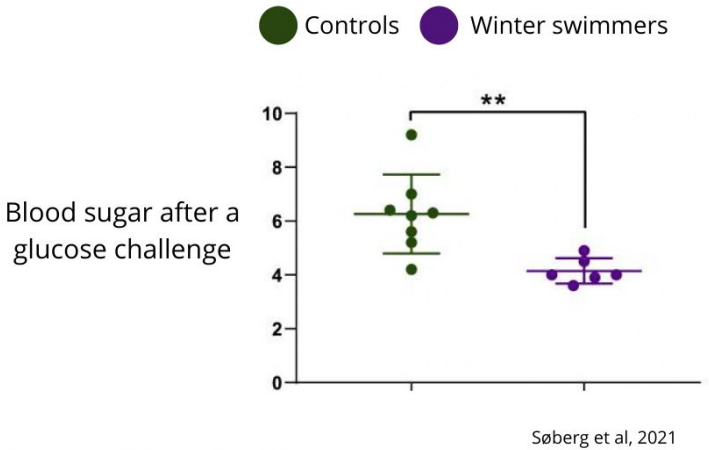


Søberg et al, 2021

Winter swimmers burned an additional ~40 kcal/hour in the cold.

Control participants burned an additional ~18 kcal/hour when cold.

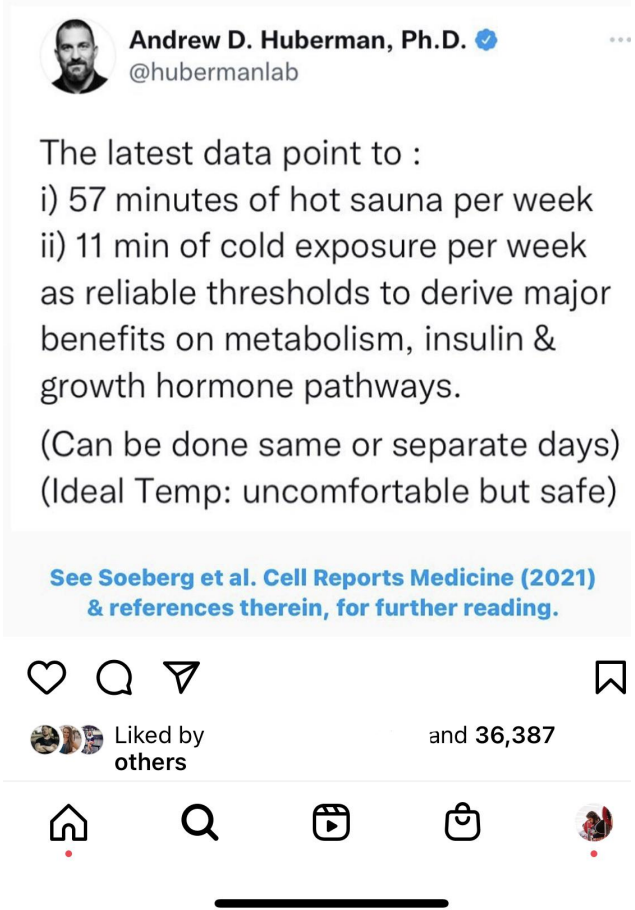
That ain't much.



Winter swimmers had a lower blood glucose after a glucose challenge.

However, the study wasn't designed to assess whether this difference was caused by cold exposure.

This is misleading and, not an accurate representation of the data he's citing.



So... WHY should you bother?

Our clients/patients/customers are exposed to B.S. nutrition info on a daily basis 

Components of a research paper:

Abstract

Introduction

Methods

Results

Discussion

Conclusions

Conflicts of Interest

The Abstract

- A brief summary that covers the main points of a study
  - Can be unintentionally (or intentionally) misleading
- Before citing a study, read the WHOLE paper

Take it with a grain of salt

Quality of Life and Mental Health in Older Adults with Obesity and Frailty: Associations with a Weight Loss Intervention

M E Payne [1], K N Porter Starr, M Orenduff, H S Mulder, S R McDonald, A P Spira, C F Pieper, C W Bales

Affiliations + expand

PMID: 30498835 PMCID: PMC6444357 DOI: 10.1007/s12603-018-1127-0

Free PMC article

Abstract

Objective: To examine the bi-directional associations of a weight loss intervention with quality of life and mental health in obese older adults with functional limitations.

Design: Combined-group analyses of secondary variables from the MEASUR-UP randomized controlled trial.

Setting: Academic medical center.

Participants: Obese community-dwelling men and women (N = 67; age ≥60; BMI ≥30) with functional limitations (Short Physical Performance Battery [SPPB] score of 4-10 out of 12).

Intervention: Six-month reduced calorie diet at two protein levels.

Measurements: Weight, height, body composition, physical function, medical history, and mental health and quality of life assessments (Center for Epidemiologic Studies Depression Scale [CES-D]; Profile of Mood States [POMS], Pittsburgh Sleep Quality Index [PSQI]; Perceived Stress Scale [PSS]; Satisfaction with Life Scale [SWLS]; and Short Form Health Survey [SF-36]) were acquired at 0, 3 and 6 months.

Results: Physical composite quality of life (SF-36) improved significantly at 3 months ($\beta = 6.29$, $t_{2,48} = 2.60$, $p = 0.012$) and 6 months ($\beta = 10.03$, $t_{2,48} = 4.83$, $p < 0.001$), as did several domains of physical quality of life. Baseline depression symptoms (CES-D and POMS) were found to predict lower amounts of weight loss; higher baseline sleep latency (PSQI) and anger (POMS) predicted less improvement in physical function (SPPB).

Conclusion: The significant bi-directional associations found between a weight loss intervention and mental health/quality of life, including substantial improvements in physical quality of life with obesity treatment, indicate the importance of considering mental health and quality of life as part of any weight loss intervention for older adults.

Trial registration: ClinicalTrials.gov NCT01715753.

Keywords: Obesity; mental health; older adults; quality of life; weight reduction.

The Introduction

- Sets the stage
  - SHOULD clearly identify the research question
  - The authors summarize previous related research, to explain why they decided to investigate further
  - You can skip or skim much of this section

Take it with a grain of salt

The Methods

- The MOST IMPORTANT part of a study
- SHOULD be clear and detailed enough that other researchers can repeat the study
- Examine this section to assess the study's strength and limitations

The Methods: Demographics

- Information about the participants
- Helps you decide how relevant the study is to you/your clients
- Demographic info affects a study's reliability and applicability
    - Reliability: Larger sample sizes = greater reliability (repeatability)
    - Applicability: Is the study relevant to you/your clients?
- Should have clear inclusion/exclusion criteria

The Methods: Study Design

Source:
https://examine.com/guides/how-to-read-a-study/

STUDY TYPES		DESIGN	STRENGTH	WEAKNESS
EVIDENCE SUMMARIES	Meta-analysis	Combs through all available literature on a topic to pool and analyze data	Can provide greater statistical power to a research question	Time consuming and requires advanced statistical knowledge
	Systematic review	Presents an expert review of the available evidence on a given topic	Can provide guidance in areas of limited research	Design differences can make comparing studies difficult
EXPERIMENTAL STUDIES	Randomized controlled trial (RCT)	Participants are randomly assigned to either an intervention group or a control group	Randomization can help eliminate population bias in sample	Can be very expensive and resource intensive
	Nonrandomized controlled trial	Participants are assigned to either an intervention group or a control group	Can blind participants to treatment	Not randomized
OBSERVATIONAL STUDIES	Cohort study	Follows a group to track habits and risk factors over time	Can be easier to conduct than an RCT	Can take years to conduct
	Case control study	Compares histories of groups with and without a specific disease or health outcome	Helps identify potential risk factors	Often confounded by recall bias
	Case report	Provides a detailed account of individual cases	Helps identify new trends	Not generalizable

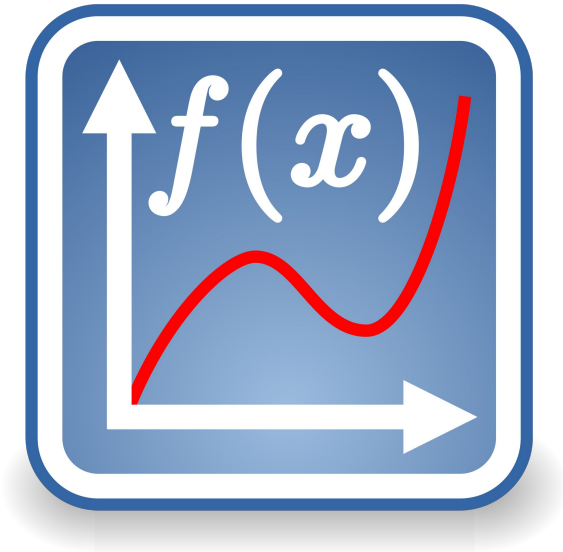
The Methods: Endpoints

- Should clearly state the endpoint(s) the researchers are looking at
- BEWARE OF STUDIES WITH LOTS OF ENDPOINTS!
    - They might focus on the endpoints with an effect,

      and downplay the endpoints without an effect
    - Preregistration can prevent this
        - If a study is pre-registered, that's a good sign

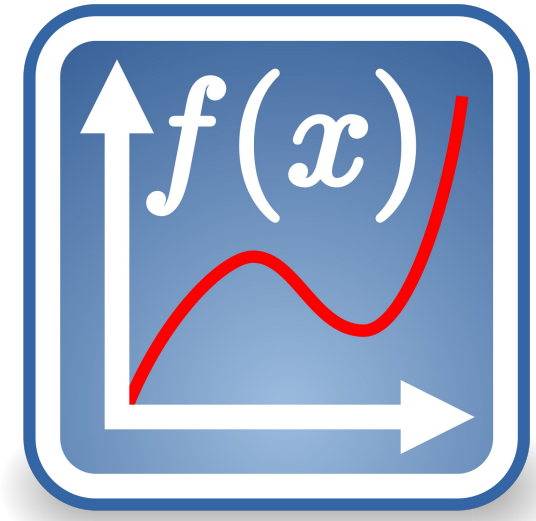
The Methods: Statistics

- The hardest part of reading research
  - Don't sweat the details
  - Do your best, and focus on the big picture
- Still…let's clear up a few things…



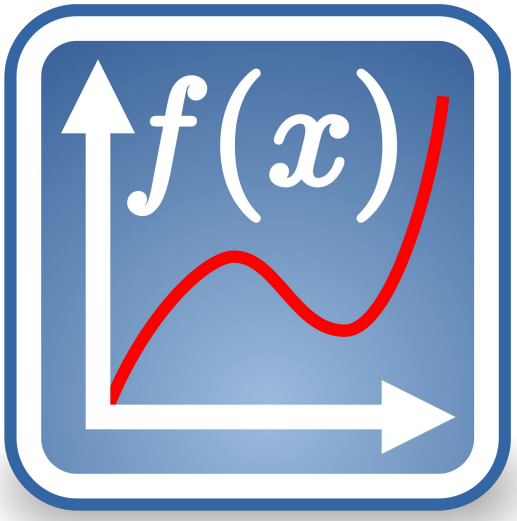
The Methods: Statistical significance

- Significant ≠ important
- Significant = statistically significant
  - **An effect is significant if the data collected over the course of the trial would be unlikely if there was no TRUE effect**
- No effect ≠ no statistically significant effect
  - Any effects were so small that they MIGHT be due to random fluctuations



The Methods: Statistical significance

- Large sample sizes = more likely to find if small effects are significant
- P values
  - An effect is (usually) considered significant if the analyses delivers a p-value below a certain threshold
  - P value = probability that the effects were due to chance
  - Most studies use $p<0.05$ as significant



The Results

- Don’t skip right to the results.
  - This leads to the spread of misinformation
  - **Understanding HOW researchers arrived at a conclusion is as important as the conclusion itself**
- Compare characteristics between tested groups
- Dropout and compliance rates
  - Large dropout rates (>20%) should raise an eyebrow

The Discussion

- The authors discuss the value of their work
  - Interpretation of their results
  - Hypothesize a mechanism of action
  - Compare their study to previous ones
- Take this section with a grain of salt.
- You can skip/skim much of this section
  - Read the strengths and weaknesses

Conflicts of Interest (COIs)

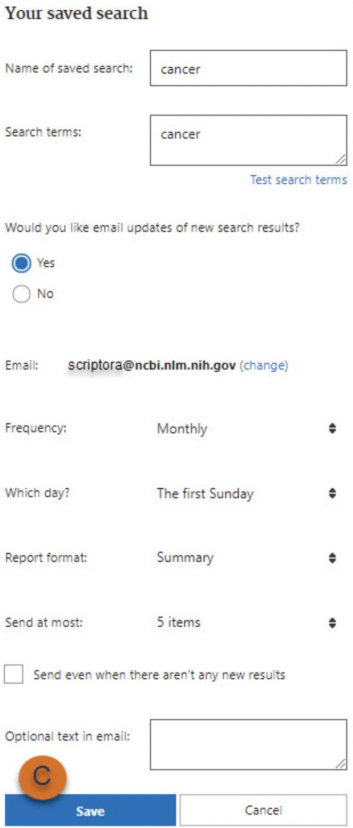
- One or more authors might have a motive to find certain results
- Funding might be from a company with a vested interest
- COIs aren't always disclosed
- Journals can have conflicts of interest, too!
- Don't disregard the results just because of a COI

Where do I find research?

How do I stay up-to date?

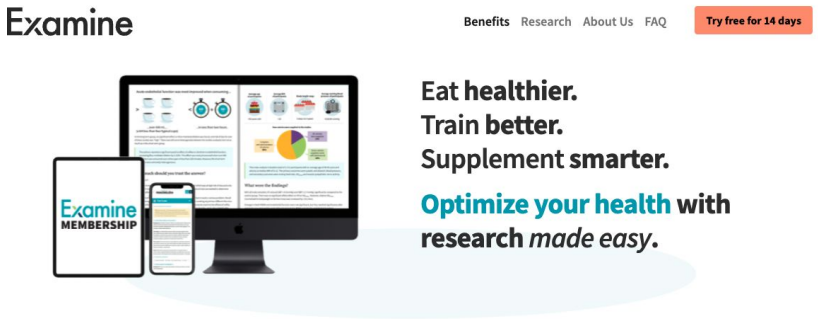
Pubmed saved searches

- Receive email updates for new studies based on a search term
  - Can be received daily, weekly, or monthly
- Great way to stay abreast of the research on a topic
- https://www.ncbi.nlm.nih.gov/books/NBK53592/



Research reviews

- Experts critically analyze studies and interpret them for you
- I write for THIS ONE:

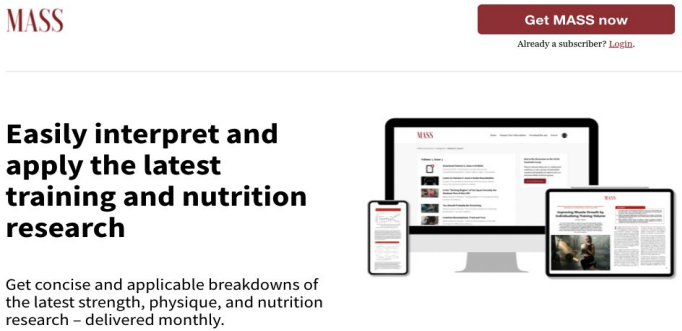


Research reviews

- I also subscribe to these:

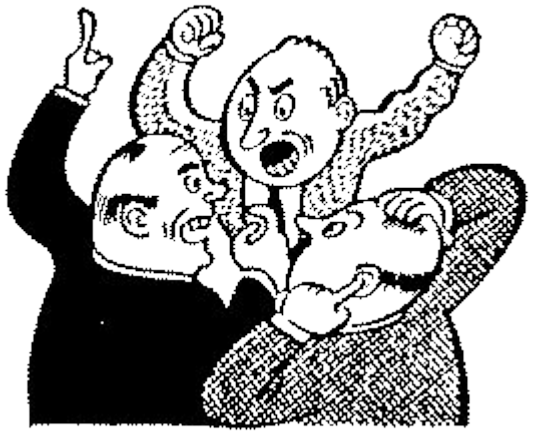
[Monthly Applications in Strength Sport](#)

[Weightology Research Review](#)



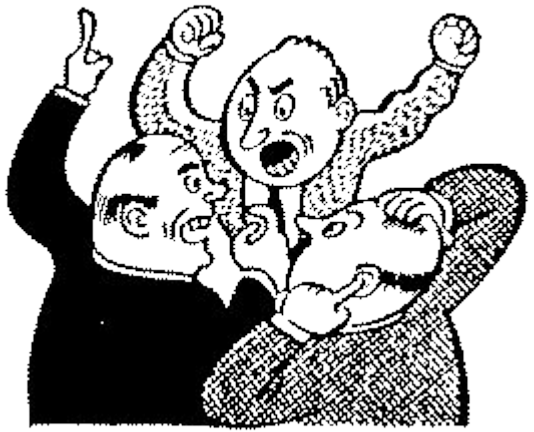
Disagreeing with others: It's an artform

- A LOT of people spread nutrition misinformation
    - It's our role to provide accurate info to the public
- HOWEVER, we need to tread carefully
    - People don't like being told they're wrong (especially on social media)
- If we go about it carefully, we can educate and have productive discussions/debates



Disagreeing with others: It's an artform

- ASK before presenting your point of view
    - "I noticed you posted about _____ recently. I actually have a different perspective on the topic. Can I share it with you?"
- Have evidence to back up your point of view
    - Be kind and respectful
- Remain humble, be open to being wrong
    - You'll gain respect this way



Disagreeing with others: It's an artform

- If it's someone with a large following,
  you can probably just leave a comment
  - Don't make things personal.
  - Say that you "respectfully disagree" and state why
- Say "I could be wrong, but…."
- Create your own content, as opposed to just responding to others
  - Your voices needs to be heard

Where to find me:

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Questions?