Mastering FLICC

BÄRBEL WINKLER
The 5 techniques of science denial (FLICC)
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Fake Experts
<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fake Experts</td>
<td>Presenting an unqualified person or institution as a source of credible information.</td>
<td>“A retired physicist argues against the climate consensus, claiming the current weather change is just a natural occurrence.”</td>
</tr>
<tr>
<td>Bulk Fake Experts</td>
<td>Citing large numbers of seeming experts to argue that there is no scientific consensus on a topic.</td>
<td>“There is no expert consensus because 31,487 Americans with a science degree signed a petition saying humans aren’t disrupting climate.”</td>
</tr>
<tr>
<td>Magnified Minority</td>
<td>Magnifying the significance of a handful of dissenting scientists to cast doubt on an overwhelming scientific consensus.</td>
<td>“Sure, there's 97% consensus but Professor Smith disagrees with the consensus position.”</td>
</tr>
<tr>
<td>Fake Debate</td>
<td>Presenting science and pseudoscience in an adversarial format to give the false impression of an ongoing scientific debate.</td>
<td>“Climate deniers should get equal coverage with climate scientists, providing a more balanced presentation of views.”</td>
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</table>
Global Warming Petition Project

31,487 American scientists have signed this petition, including 9,029 with PhDs

Petition

We urge the United States government to reject the global warming agreement that was written in Kyoto, Japan in December, 1997, and any other similar proposals. The proposed limits on greenhouse gases would harm the environment, hinder the advance of science and technology, and damage the health and welfare of mankind.

There is no convincing scientific evidence that human release of carbon dioxide, methane, or other greenhouse gases is causing or will, in the foreseeable future, cause catastrophic heating of the Earth’s atmosphere and disruption of the Earth’s climate. Moreover, there is substantial scientific evidence that increases in atmospheric carbon dioxide produce many beneficial effects upon the natural plant and animal environments of the Earth.
Signatures

As infectious disease epidemiologists and public health scientists we have grave concerns about the damaging physical and mental health impacts of the prevailing COVID-19 policies, and recommend an approach we call Focused Protection.

<table>
<thead>
<tr>
<th>concerned citizens</th>
<th>medical &amp; public health scientists</th>
<th>medical practitioners</th>
</tr>
</thead>
<tbody>
<tr>
<td>727,141</td>
<td>13,290</td>
<td>40,199</td>
</tr>
</tbody>
</table>
The 5 techniques of science denial (FLICC)

- Fake Experts
- Logical Fallacies
<table>
<thead>
<tr>
<th>Logical Fallacies</th>
<th>Arguments where the conclusion doesn’t logically follow from the premises. Also known as a non sequitur.</th>
<th>“Climate has changed naturally in the past so what’s happening now must be natural.”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ad Hominem</td>
<td>Attacking a person/group instead of addressing their arguments.</td>
<td>“Climate science can’t be trusted because climate scientists are biased.”</td>
</tr>
<tr>
<td>Ambiguity</td>
<td>Using ambiguous language in order to lead to a misleading conclusion.</td>
<td>“Thermometer readings have uncertainty which means we don’t know whether global warming is happening.”</td>
</tr>
<tr>
<td>Red Herring</td>
<td>Deliberately diverting attention to an irrelevant point to distract from a more important point.</td>
<td>“CO₂ is a trace gas so it’s warming effect is minimal.”</td>
</tr>
<tr>
<td>Fallacy</td>
<td>Description</td>
<td>Example</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>False Choice</td>
<td>Presenting two options as the only possibilities, when other possibilities exist.</td>
<td>\textit{CO}_2 \text{ lags temperature in the ice core record, proving that temperature drives CO}_2, not the other way around.</td>
</tr>
<tr>
<td>Single Cause</td>
<td>Assuming a single cause or reason when there might be multiple causes or reasons.</td>
<td>\textit{Climate has changed naturally in the past so what’s happening now must be natural.}</td>
</tr>
<tr>
<td>Slippery Slope</td>
<td>Suggesting that taking a minor action will inevitably lead to major consequences.</td>
<td>\textit{If we implement even a modest climate policy, it will start us down the slippery slope to socialism and taking away our freedom.}</td>
</tr>
<tr>
<td>Misrepresentation</td>
<td>Misrepresenting a situation or an opponent’s position in such a way as to distort understanding.</td>
<td>\textit{They changed the name from ‘global warming’ to ‘climate change’ because global warming stopped happening.}</td>
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<tr>
<td>Fallacy</td>
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<td>-----------------</td>
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</tr>
<tr>
<td>Straw Man</td>
<td>Misrepresenting or exaggerating an opponent’s position to make it easier to attack.</td>
<td>“In the 1970s, climate scientists were predicting an ice age.”</td>
</tr>
<tr>
<td>Oversimplification</td>
<td>Simplifying a situation in such a way as to distort understanding, leading to erroneous conclusions.</td>
<td>“CO$_2$ is plant food so burning fossil fuels will be good for plants.”</td>
</tr>
<tr>
<td>Blowfish</td>
<td>Focusing on an inconsequential aspect of scientific research, blowing it out of proportion in order to distract from or cast doubt on the main conclusions of the research.</td>
<td>“The hockey stick graph is invalid because it contains statistical errors.”</td>
</tr>
</tbody>
</table>
**False Equivalence (apples vs. oranges)**

Incorrectly claiming that two things are equivalent, despite the fact that there are notable differences between them.

"Why all the fuss about COVID when thousands die from the flu every year."

**False Analogy**

Assuming that because two things are alike in some ways, they are alike in some other respect.

"Climate skeptics are like Galileo who overturned the scientific consensus about geocentrism."

**False balance (fake debate)**

Presenting science and pseudoscience in an adversarial format to give the false impression of an ongoing scientific debate.

"Climate deniers should get equal coverage with climate scientists, providing a more balanced presentation of views."
“I have blue eyes, so I’m an expert in quantum physics.”
The 5 techniques of science denial (FLICC)

- Fake Experts
- Logical Fallacies
- Impossible Expectations
<table>
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<tr>
<th></th>
<th>Impossible Expectations</th>
<th>Demanding unrealistic standards of certainty before acting on the science.</th>
<th>“Scientists can’t even predict the weather next week. How can they predict the climate in 100 years?”</th>
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<td>Lowered Expectations</td>
<td>Lowering the standard by which you grade a performance or assess evidence.</td>
<td>“Two snapshots of Mars show shrinking ice, so Mars is global warming.”</td>
</tr>
<tr>
<td></td>
<td>Moving Goalposts</td>
<td>Demanding higher levels of evidence after receiving requested evidence.</td>
<td>“Sea levels may be rising but they’re not accelerating.”</td>
</tr>
<tr>
<td></td>
<td>Anchoring</td>
<td>Depending too heavily on an initial piece of information when making subsequent judgments.</td>
<td>“2.2 million people might have died from COVID-19 so keeping it down to only 130,000 deaths is a good job.”</td>
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“Scientists can’t even predict the weather next week. How can they predict the climate in 100 years?”
The 5 techniques of science denial (FLICC)

- Fake Experts
- Logical Fallacies
- Impossible Expectations
- Cherry Picking
- OISM Petition Project
Cherry Picking: Carefully selecting data that appear to confirm one position while ignoring other data that contradicts that position.

“Global warming stopped in 1998.”

Anecdote: Using personal experience or isolated examples instead of sound arguments or compelling evidence.

“The weather is cold today—whatever happened to global warming?”

Slothful Induction: Ignoring relevant evidence when coming to a conclusion.

“There is no empirical evidence that humans are causing global warming.”

Quote Mining: Taking a person’s words out-of-context in order to misrepresent their position.

“Mike’s trick... to hide the decline.”

Wishful Thinking: Choosing to believe something is true because we really want it to be true, instead of relying on scientific evidence.

“Forget climate model predictions of warming. I think we’re about to experience global cooling.”
The 5 techniques of science denial (FLICC)

- Fake Experts
- Logical Fallacies
- Impossible Expectations
- Cherry Picking
- Conspiracy Theories
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Example</th>
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<tbody>
<tr>
<td>Conspiracy Theory</td>
<td>Proposing that a secret plan exists to implement a nefarious scheme such as hiding a truth.</td>
<td>“The climategate emails prove that climate scientists have engaged in a conspiracy to deceive the public.”</td>
</tr>
<tr>
<td>Overriding suspicion</td>
<td>Having a nihilistic degree of skepticism towards the official account, preventing belief in anything that doesn’t fit into the conspiracy theory.</td>
<td>“Show me one line of evidence for climate change... oh, that evidence is faked!”</td>
</tr>
<tr>
<td>Nefarious intent</td>
<td>Assuming that the motivations behind any presumed conspiracy are nefarious.</td>
<td>“Climate scientists promote the climate hoax because they're in it for the money.”</td>
</tr>
<tr>
<td>Contradictory</td>
<td>Simultaneously believing in ideas that are mutually contradictory.</td>
<td>“The temperature record is fabricated by scientists... the temperature record shows cooling.”</td>
</tr>
<tr>
<td>Concept</td>
<td>Description</td>
<td>Example</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----------------------------------------------------------------------------</td>
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<tr>
<td><strong>Something must be wrong</strong></td>
<td>Maintaining that “something must be wrong” and the official account is based on deception, even when specific parts of a conspiracy theory become untenable.</td>
<td>“Ok, fine, 97% of climate scientists agree that humans are causing global warming, but that's just because they're toeing the party line.”</td>
</tr>
<tr>
<td><strong>Persecuted victim</strong></td>
<td>Perceiving and presenting themselves as the victim of organized persecution.</td>
<td>“Climate scientists are trying to take away our freedom.”</td>
</tr>
<tr>
<td><strong>Immune to evidence</strong></td>
<td>Re-interpreting any evidence that counters a conspiracy theory as originating from the conspiracy.</td>
<td>“Those investigations finding climate scientists aren't conspiring were part of the conspiracy.”</td>
</tr>
<tr>
<td><strong>Re-interpreting randomness</strong></td>
<td>Believing that nothing occurs by accident, so that random events are re-interpreted as being caused by the conspiracy.</td>
<td>“NASA's satellite exploded? They must be trying to hide inconvenient data!”</td>
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The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive.
FLICC Quiz
with Cranky Uncle!
Preparation 1:
Follow the link or scan the QR-code to access the FLICC cheat-sheet!
sks.to/flicc-cheat-sheet
Preparation 2:

Want to see how you are doing?

Fill out the Google form in parallel:

sks.to/flicc-quiz
QUIZ 1: Name the fallacy

WHAT DO YOU MEAN WE’RE SINKING? I’M MOVING UPWARDS!

Options:
- Ad hominem
- Cherry picking
- Fake debate
- Impossible expectations
QUIZ 1: Name the fallacy

WHAT DO YOU MEAN WE’RE SINKING? I’M MOVING UPWARDS!

Ad hominem  Cherry picking  False balance  Impossible expectations
QUIZ 2: Name the fallacy

RELAX! I HAVE A BACHELOR IN COMPUTER SCIENCE!

Overriding suspicion
Lowered expectations
False choice
Fake experts
QUIZ 2:
Name the fallacy

RELAX!
I HAVE A BACHELOR IN COMPUTER SCIENCE!
QUIZ 3: Name the fallacy

- Gravity is just a theory!
QUIZ 3: Name the fallacy

Gravity is just a theory!
Which argument is an ad hominem attack?

A. Climate scientists are just in it for the money!

B. We need more research before we can be 100% sure that vaccination is safe.

C. You have blond hair so your opinion is invalid.
QUIZ 4: Multiple-choice

Which argument is an ad hominem attack?

- A. Climate scientists are just in it for the money!
- B. We need more research before we can be 100% sure that vaccination is safe.
- C. You have blond hair so your opinion is invalid.
QUIZ 5:
Name the fallacy

IT'S COLD...

...GLOBAL WARMING DOESN'T EXIST!
QUIZ 5: Name the fallacy

IT’S COLD...

...GLOBAL WARMING DOESN’T EXIST!

Fake debate
Conspiracy theory
Anecdote
Ad hominem
YOU’LL HIT THE GROUND IN 12 TO 15 SECONDS.

GET BACK TO ME WHEN YOU HAVE MORE CERTAINTY!

QUIZ 6: Name the fallacy

- Quote mining
- Impossible expectations
- False choice
- Fake expert
YOU’LL HIT THE GROUND IN 12 TO 15 SECONDS.

GET BACK TO ME WHEN YOU HAVE MORE CERTAINTY!
QUIZ 7: Multiple-choice

Which of these is a conspiracy theory?

A - Today is really hot - that proves global warming is happening!

B - Chemtrails are spread in a government program to control the population.

C - You’re just overweight because you don’t exercise enough.
QUIZ 7: Multiple-choice

Which of these is a conspiracy theory?

A. Today is really hot - that proves global warming is happening!

B. Chemtrails are spread in a government program to control the population.

C. You’re just overweight because you don’t exercise enough.
QUIZ 8: Name the fallacy

- Single cause
- Cherry picking
- Nefarious intent
- Lowered expectations
QUIZ 8: Name the fallacy

THIS PERSON DIED OF NATURAL CAUSES...

...BECAUSE PEOPLE HAVE ALWAYS DIED OF NATURAL CAUSES.

[Options]
- A→B: Single cause
- Cherry picking
- Nefarious intent
- Lowered expectations
QUIZ 9: Name the fallacy

AHA! PROOF THAT EGGS DON'T COME FROM CHICKENS!

Fake debate
Conspiracy theory
Slothful induction
False choice
QUIZ 9: Name the fallacy

AHA! PROOF THAT EGGS DON’T COME FROM CHICKENS!
SURE, YOU CAN DRINK THE WATER. IT ONLY HAS A TRACE OF ARSENIC!
QUIZ 10: Name the fallacy

Red herring

Anecdote

Impossible expectations

Magnified minorities

SURE, YOU CAN DRINK THE WATER. IT ONLY HAS A TRACE OF ARSENIC!
QUIZ 11: Multiple-choice

Which of the following is cherry picking?

A. I just ate a big meal. Global hunger doesn't exist.

B. Birds fly so gravity is a hoax.

C. Hot dogs are better than nothing. Nothing is better than steak. Therefore hot dogs are better than steak.
QUIZ 11: Multiple-choice

Which of the following is cherry picking?

A. I just ate a big meal. Global hunger doesn't exist.

B. Birds fly so gravity is a hoax.

C. Ambiguity

Single cause

B. Birds fly so gravity is a hoax.

Ambiguity

C. Hot dogs are better than nothing. Nothing is better than steak. Therefore hot dogs are better than steak.
TONIGHT, WE’LL BE TALKING TO A SCIENTIST ABOUT THE SOLAR SYSTEM...

...TO BALANCE HER VIEWS, WE’VE INVITED A MEMBER OF THE FLAT EARTH SOCIETY!

QUIZ 12: Name the fallacy

Nefarious intent  Fake debate  Cherry picking  Ambiguity
QUIZ 12: Name the fallacy

- Nefarious intent
- Fake debate
- Cherry picking
- Ambiguity
Cranky Uncle to the rescue!
Understand cranky uncles by becoming a cranky uncle

https://sks.to/crankyiphone

https://sks.to/crankyandroid

https://sks.to/crankybrowser

Learn techniques of science denial
Cranky Uncle mentors you on how to deny science

Practise spotting denial techniques in cartoon quizzes

Build up cranky points
Level up and see your mood get crankier!

Unlock new denial techniques

Definitions of each denial technique at your fingertips

Correct. Just because your dog likes milk doesn't mean it's a cat. That's some top-notch jumping.

Congrats on reaching level 2!
Cranky Uncle's mood is now Displeased.

Great!

Logical Fallacies

Cherry Picking

Cherry picking involves carefully selecting data that appear to confirm one position while ignoring other data that contradicts that position.

Got it, thanks!

Logical Fallacies

Red Herring

Red Herring
Cranky Uncle - a multi-lingual critical thinking game to build resilience against climate misinformation

Game is available for iPhone, Android and Browser

sks.to/crakyiphone
sks.to/crakyandroid
sks.to/crakybrowser
Thanks to John Cook for his slides as well as the Cranky Uncle cartoons used in this presentation!

More information is available at https://crankyuncle.com
Thank you!

Bärbel Winkler

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Web - https://skepticalscience.com
More about me - https://sks.to/BaerbelW
List of and links to Resources

Skeptical Science
https://sks.to

MOOC Denial101x
https://sks.to/Denial101x

History of FLICC
https://sks.to/FLICC

FLICC Poster
https://sks.to/FLICC-poster

Cranky Uncle
Game and Book
https://crankyuncle.com

The Teachers’ Guide to Cranky Uncle
https://sks.to/crankyguide

The Debunking Handbook 2020
https://sks.to/debunk2020

The Conspiracy Theory Handbook
https://sks.to/conspiracy