

Mastering FLICC

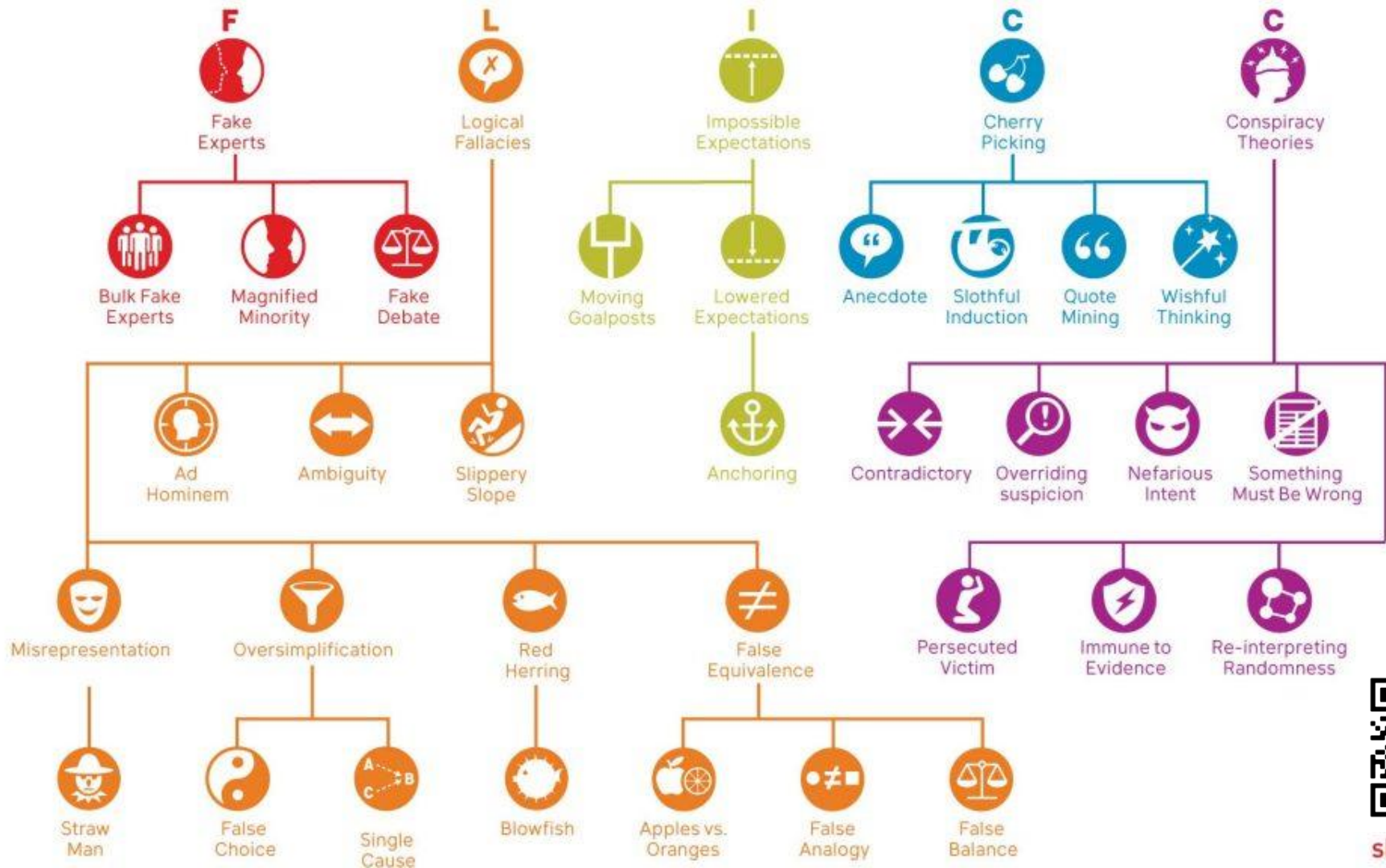
BÄRBEL WINKLER



***Cranky
Uncle***



Skeptical Science



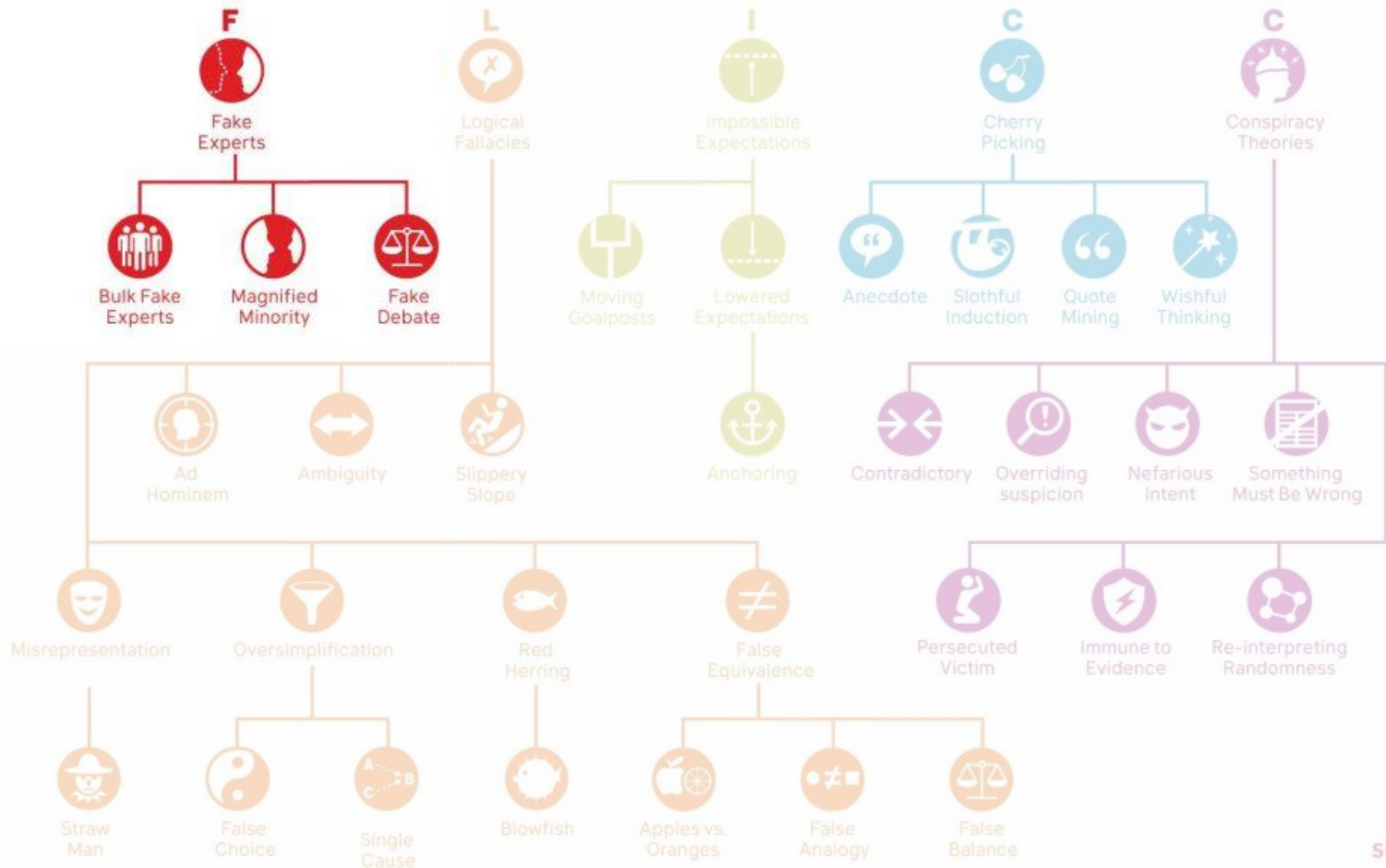
The 5 techniques of science denial (FLICC)



The 5 techniques of science denial (FLICC)

 Fake Experts







Fake Experts
(appeal to false authority)

Presenting an unqualified person or institution as a source of credible information.

“A retired physicist argues against the climate consensus, claiming the current weather change is just a natural occurrence.”



Bulk Fake Experts

Citing large numbers of seeming experts to argue that there is no scientific consensus on a topic.

“There is no expert consensus because 31,487 Americans with a science degree signed a petition saying humans aren't disrupting climate.”



Magnified Minority

Magnifying the significance of a handful of dissenting scientists to cast doubt on an overwhelming scientific consensus.

“Sure, there's 97% consensus but Professor Smith disagrees with the consensus position.”



Fake Debate
(false balance)

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.”

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.

concerned citizens

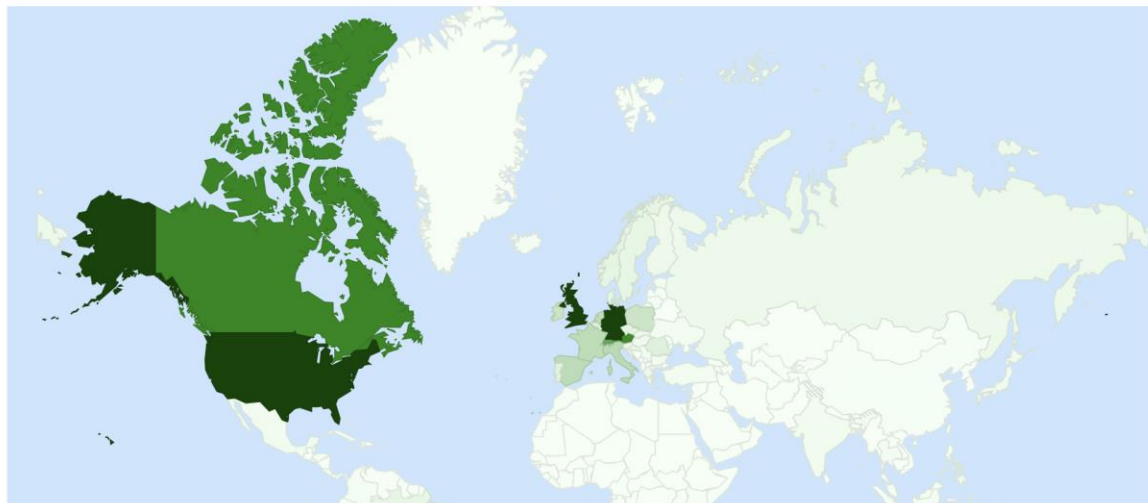
727,141

medical & public health scientists

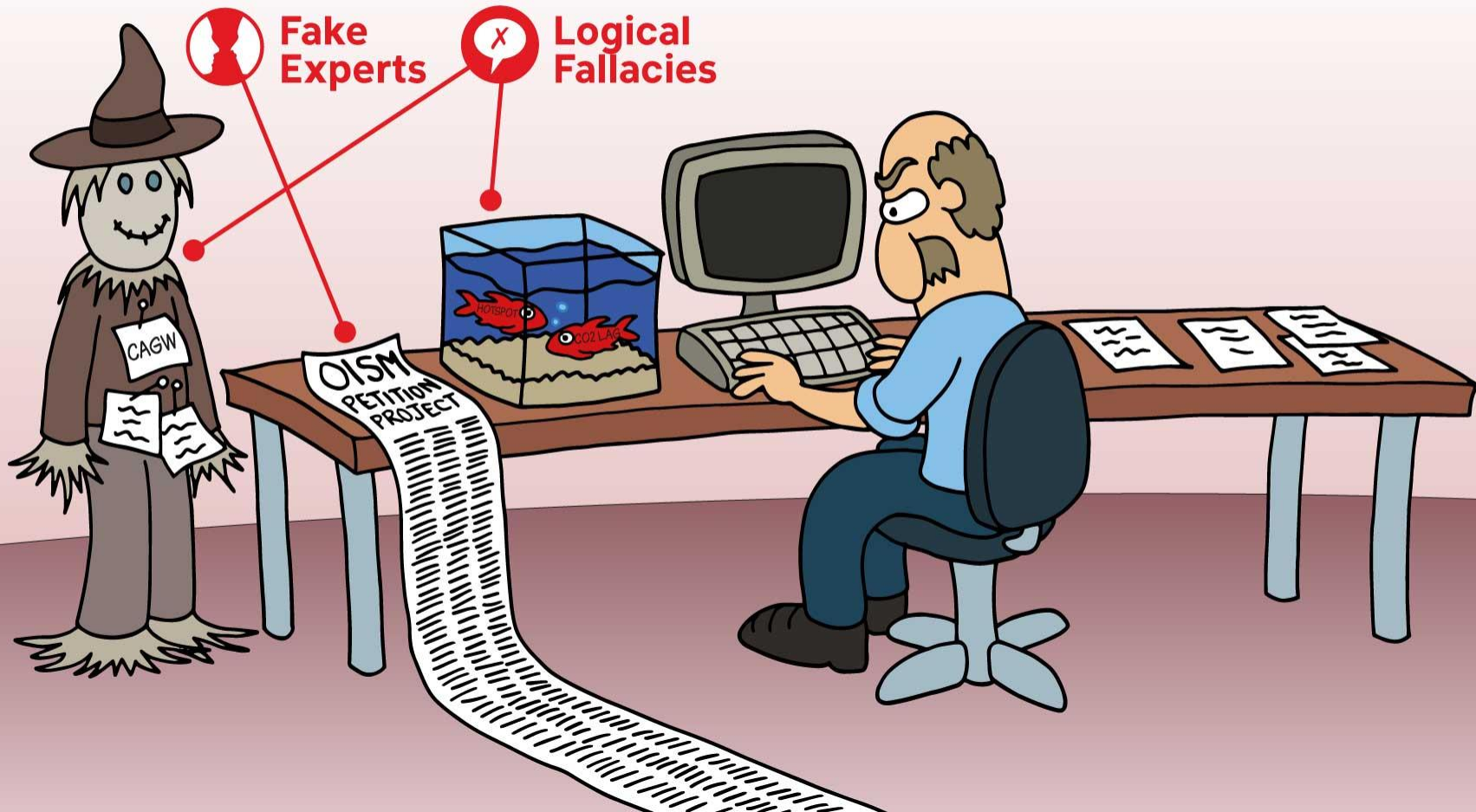
13,290

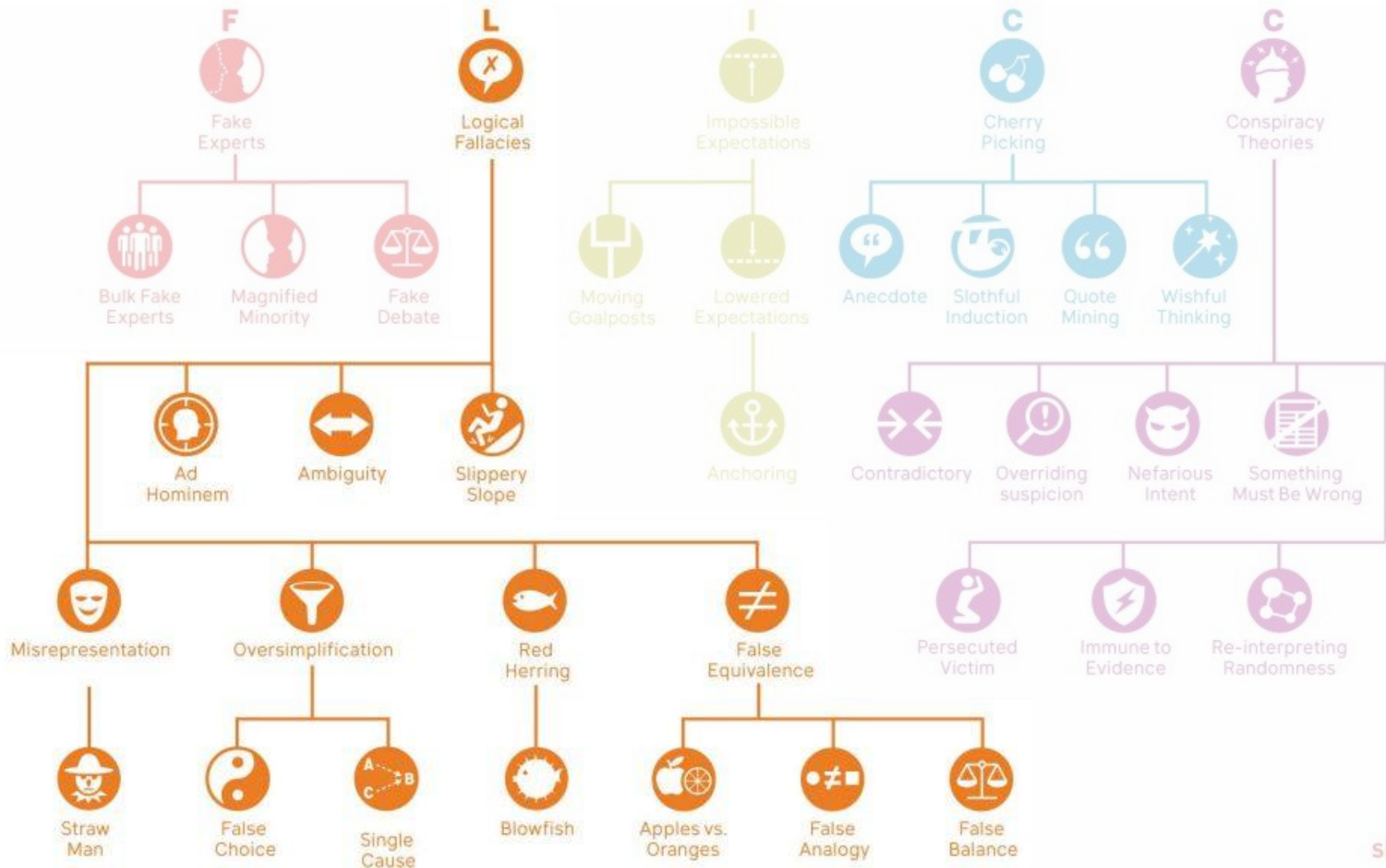
medical practitioners

40,199



The 5 techniques of science denial (FLICC)







Logical Fallacies

Arguments where the conclusion doesn't logically follow from the premises. Also known as a non sequitur.

"Climate has changed naturally in the past so what's happening now must be natural."



Ad Hominem

Attacking a person/group instead of addressing their arguments.

"Climate science can't be trusted because climate scientists are biased."



Ambiguity

Using ambiguous language in order to lead to a misleading conclusion.

"Thermometer readings have uncertainty which means we don't know whether global warming is happening."



Red Herring

Deliberately diverting attention to an irrelevant point to distract from a more important point.

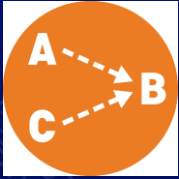
"CO₂ is a trace gas so its warming effect is minimal."



False Choice

Presenting two options as the only possibilities, when other possibilities exist.

“CO₂ lags temperature in the ice core record, proving that temperature drives CO₂, not the other way around.”



Single Cause

Assuming a single cause or reason when there might be multiple causes or reasons.

“Climate has changed naturally in the past so what’s happening now must be natural.”



Slippery Slope

Suggesting that taking a minor action will inevitably lead to major consequences.

“If we implement even a modest climate policy, it will start us down the slippery slope to socialism and taking away our freedom.”



Misrepresentation

Misrepresenting a situation or an opponent’s position in such a way as to distort understanding.

“They changed the name from ‘global warming’ to ‘climate change’ because global warming stopped happening.”



Straw Man

Misrepresenting or exaggerating an opponent's position to make it easier to attack.

"In the 1970s, climate scientists were predicting an ice age."



Oversimplification

Simplifying a situation in such a way as to distort understanding, leading to erroneous conclusions.

"CO₂ is plant food so burning fossil fuels will be good for plants."



Blowfish

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.

"The hockey stick graph is invalid because it contains statistical errors."



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 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)

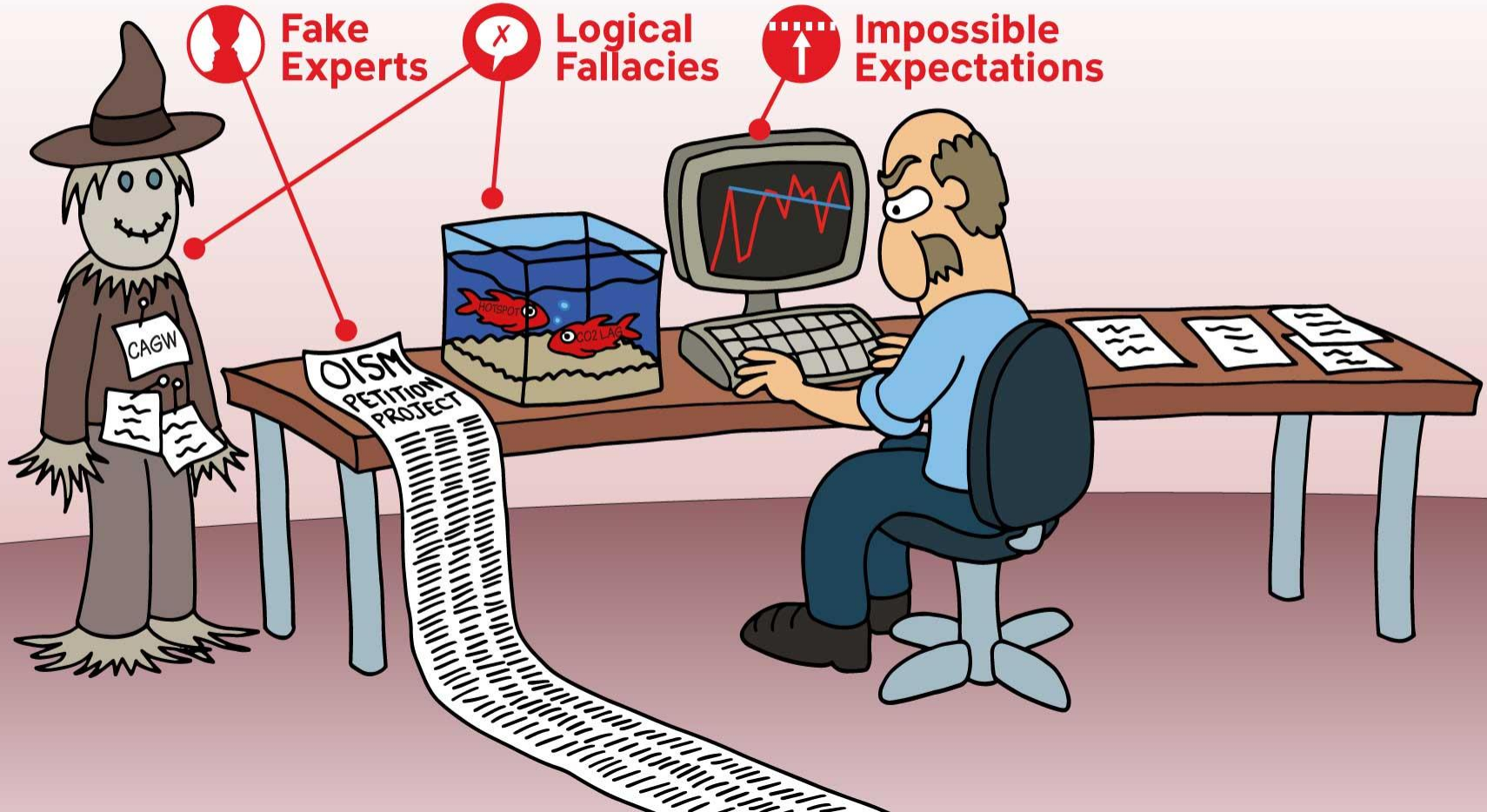
Presenting science and pseudoscience in an adversarial format to give the false impression of an ongoing scientific debate.

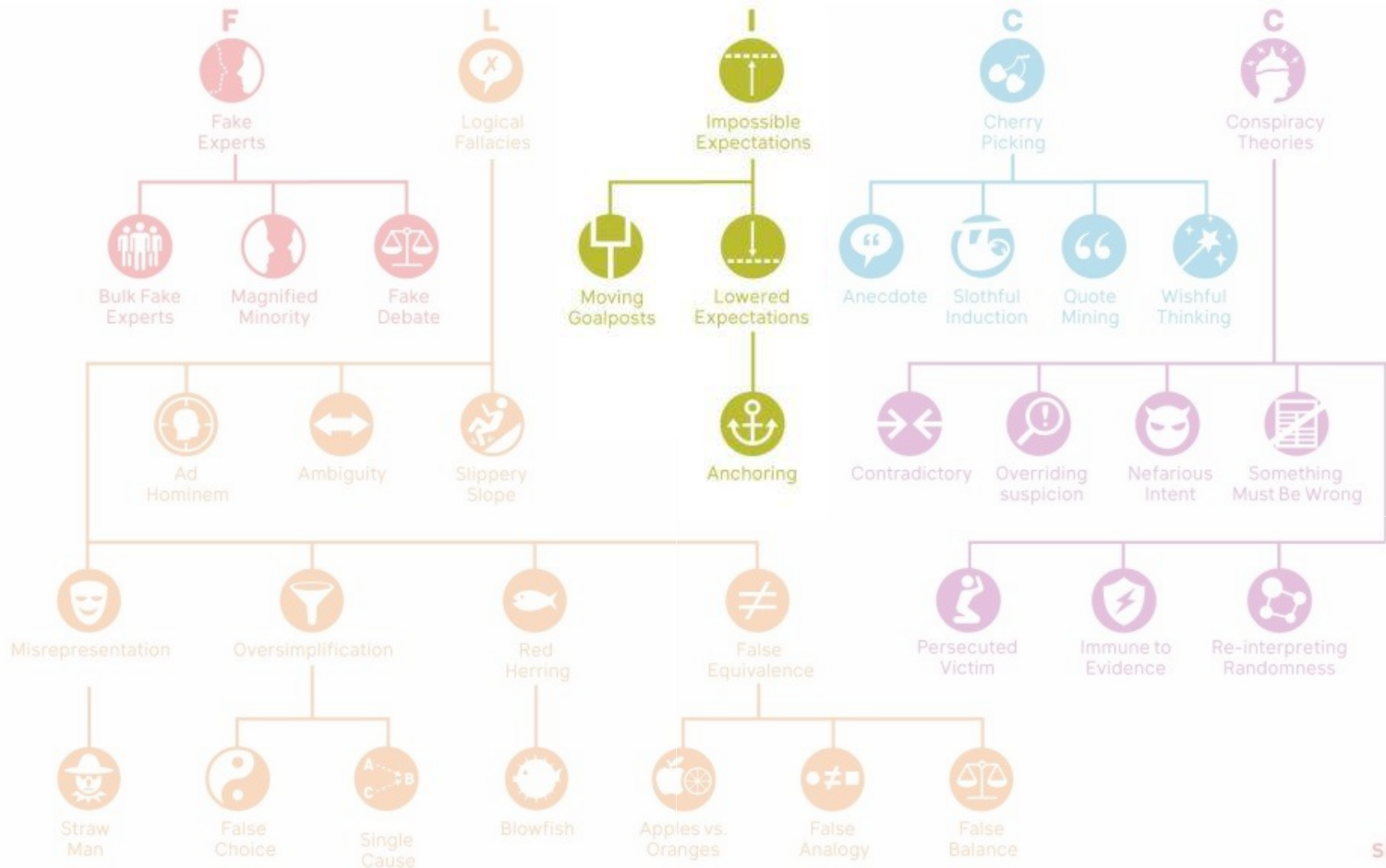
“Climate deniers should get equal coverage with climate scientists, providing a more balanced presentation of views.”

The background features a variety of white line-art illustrations of people in different poses and activities. Some are standing with arms crossed, some are sitting on the ground, some are holding objects like a burger or a newspaper, and some are in dynamic, expressive poses. The overall style is simple and cartoonish.

“I have blue eyes, so I’m an expert in quantum physics.”

The 5 techniques of science denial (FLICC)



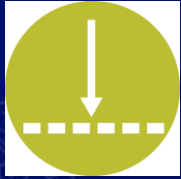




Impossible Expectations

Demanding unrealistic standards of certainty before acting on the science.

“Scientists can’t even predict the weather next week. How can they predict the climate in 100 years?”



Lowered Expectations

Lowering the standard by which you grade a performance or assess evidence.

“Two snapshots of Mars show shrinking ice, so Mars is global warming.”



Moving Goalposts

Demanding higher levels of evidence after receiving requested evidence.

“Sea levels may be rising but they’re not accelerating.”



Anchoring

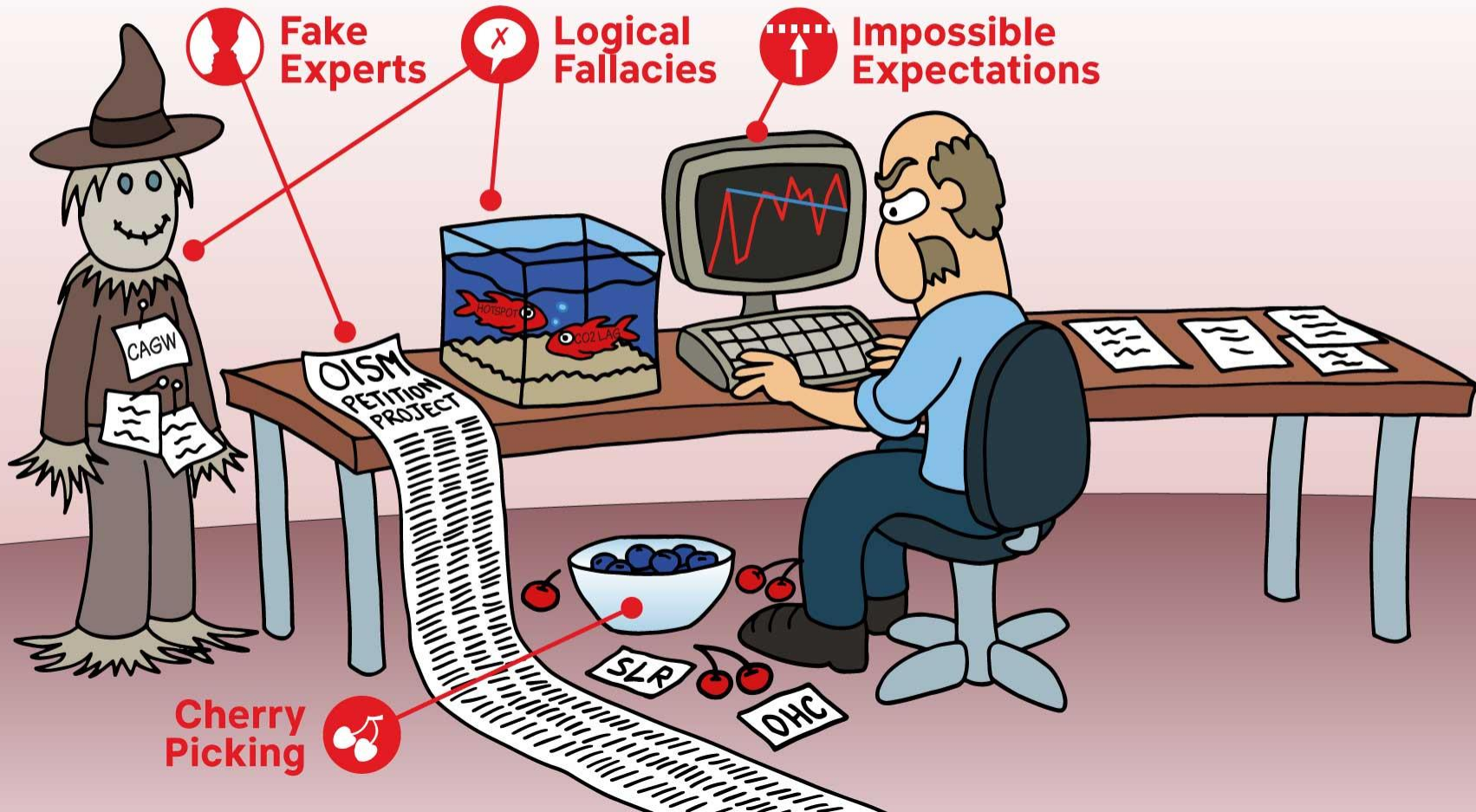
Depending too heavily on an initial piece of information when making subsequent judgments.

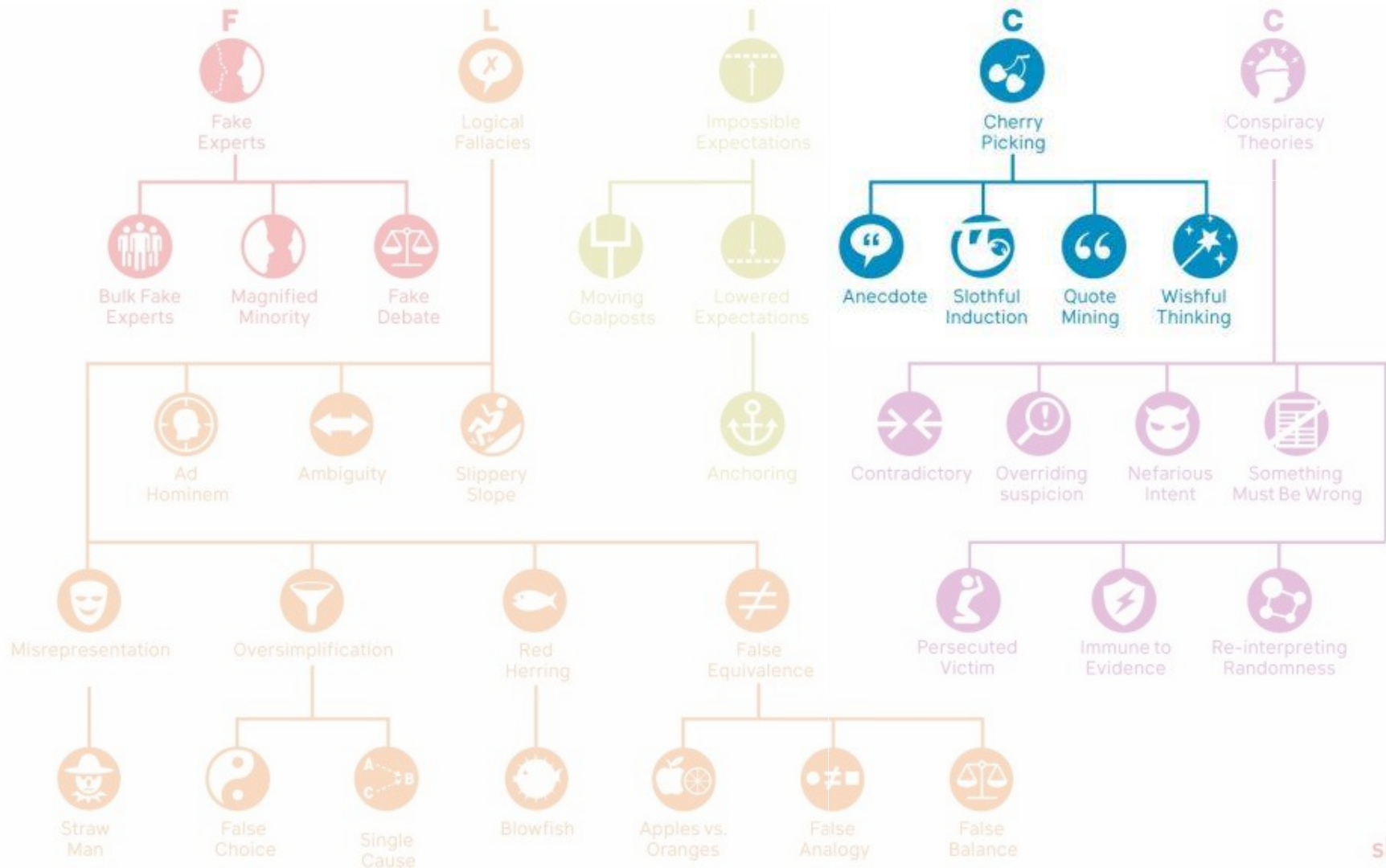
“2.2 million people might have died from COVID-19 so keeping it down to only 130,000 deaths is a good job.”



“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)







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.

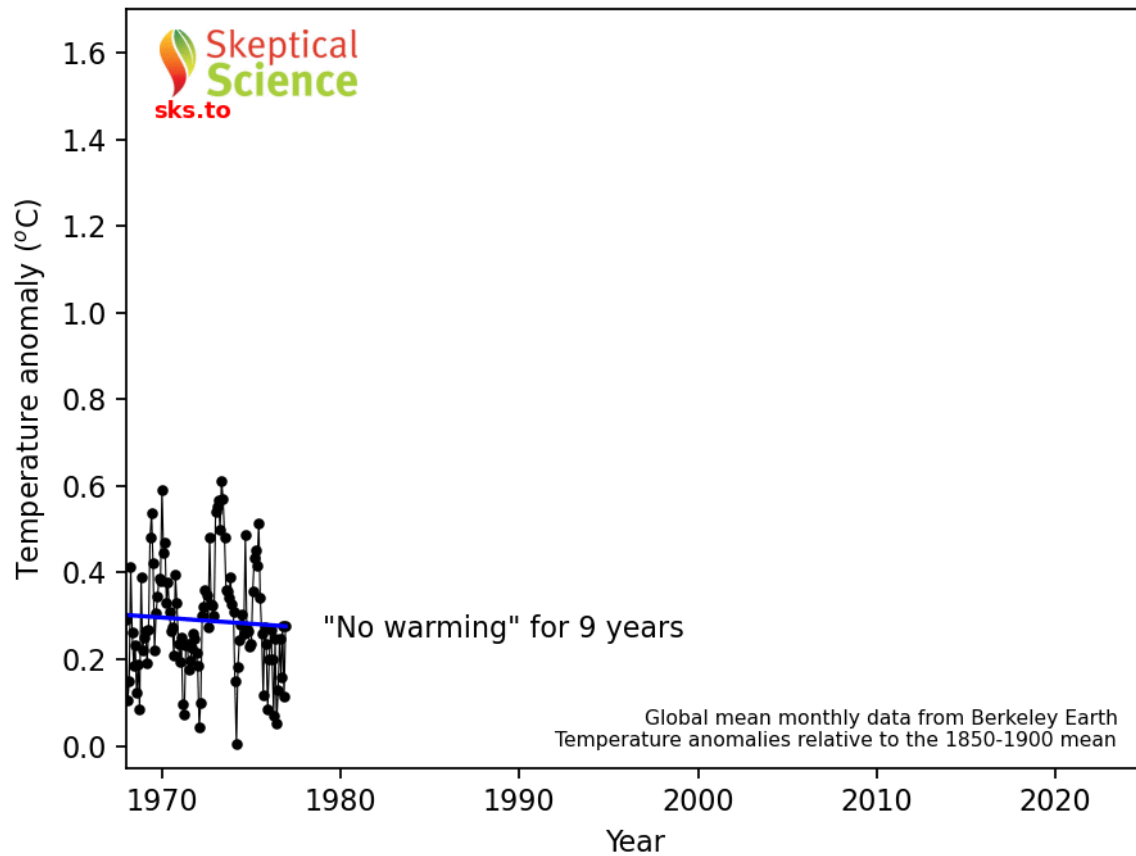
“Mike’s trick... to hide the decline.”



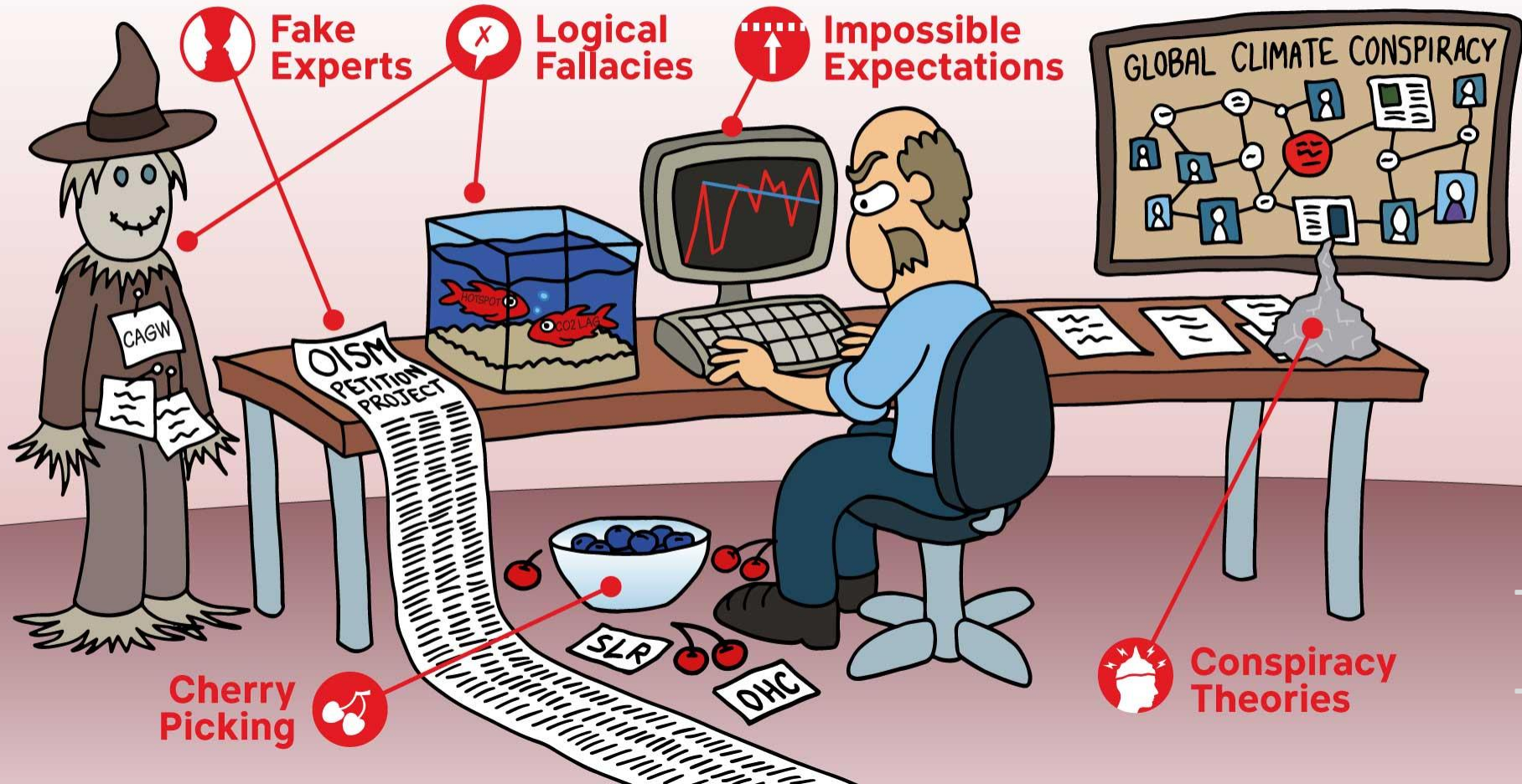
Wishful Thinking

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)



Cherry Picking



Fake Experts



Logical Fallacies

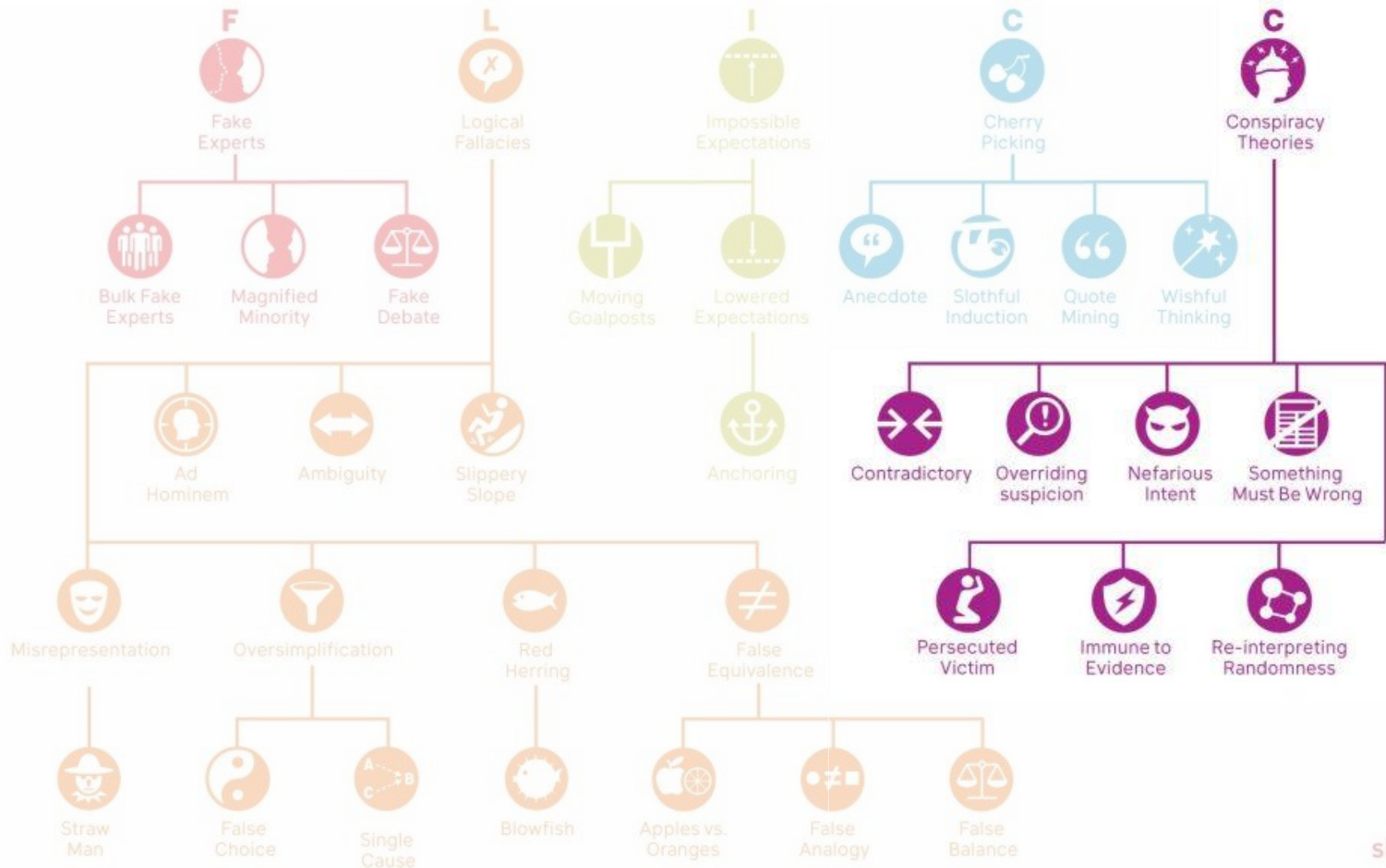


Impossible Expectations



Conspiracy Theories







Conspiracy Theory

Proposing that a secret plan exists to implement a nefarious scheme such as hiding a truth.

"The climategate emails prove that climate scientists have engaged in a conspiracy to deceive the public."



Overriding suspicion

Having a nihilistic degree of skepticism towards the official account, preventing belief in anything that doesn't fit into the conspiracy theory.

"Show me one line of evidence for climate change... oh, that evidence is faked!"



Nefarious intent

Assuming that the motivations behind any presumed conspiracy are nefarious.

"Climate scientists promote the climate hoax because they're in it for the money."



Contradictory

Simultaneously believing in ideas that are mutually contradictory.

"The temperature record is fabricated by scientists... the temperature record shows cooling."



Something must be wrong

Maintaining that “something must be wrong” and the official account is based on deception, even when specific parts of a conspiracy theory become untenable.

“Ok, fine, 97% of climate scientists agree that humans are causing global warming, but that’s just because they’re toeing the party line.”



Persecuted victim

Perceiving and presenting themselves as the victim of organized persecution.

“Climate scientists are trying to take away our freedom.”



Immune to evidence

Re-interpreting any evidence that counters a conspiracy theory as originating from the conspiracy.

“Those investigations finding climate scientists aren’t conspiring were part of the conspiracy.”



Re-interpreting randomness

Believing that nothing occurs by accident, so that random events are re-interpreted as being caused by the conspiracy.

“NASA’s satellite exploded? They must be trying to hide inconvenient data!”



Donald J. Trump 

@realDonaldTrump

The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive.

2:15 PM · Nov 6, 2012 · [Twitter Web Client](#)

96.7K Retweets **64.7K** Likes

FLICC Quiz with Cranky Uncle!



***Cranky
Uncle***

Preparation 1:

Follow the link or scan the QR-code
to access the FLICC cheat-sheet!

sks.to/flicc-cheat-sheet



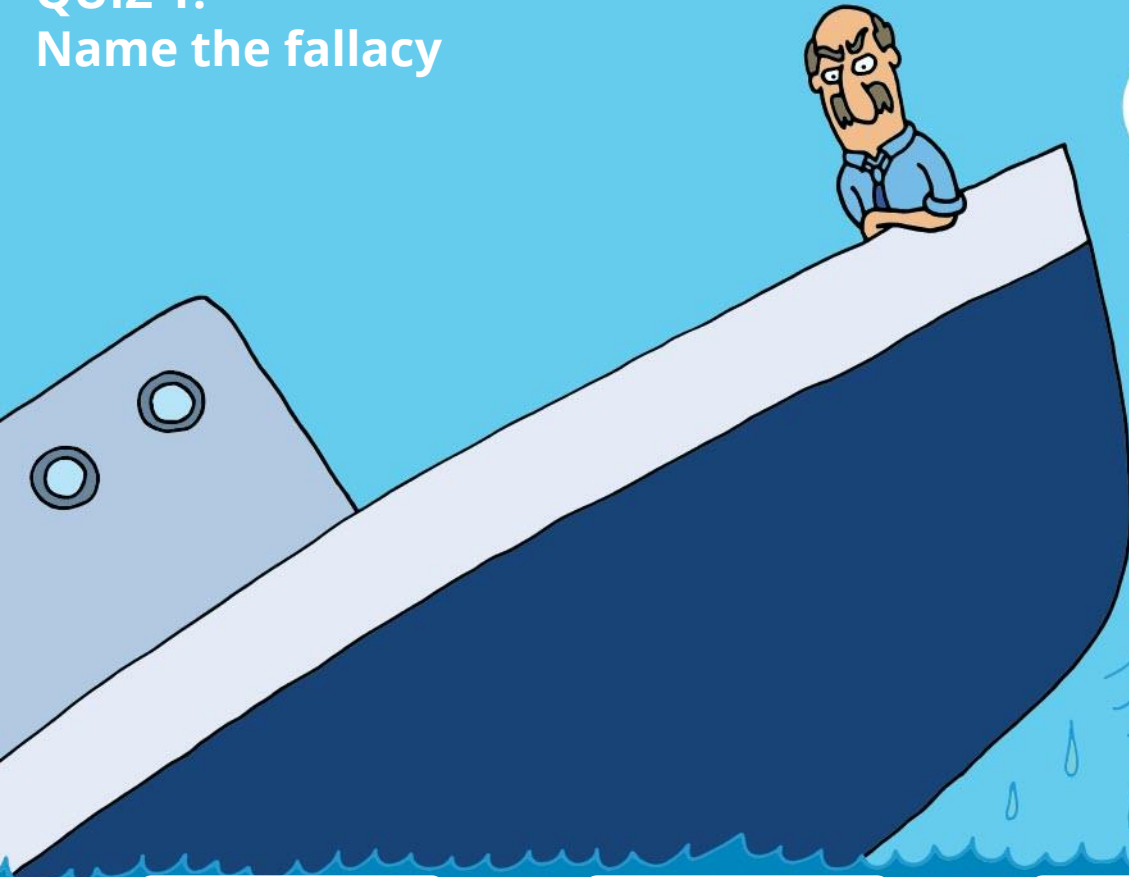
Preparation 2:

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!

 Ad hominem

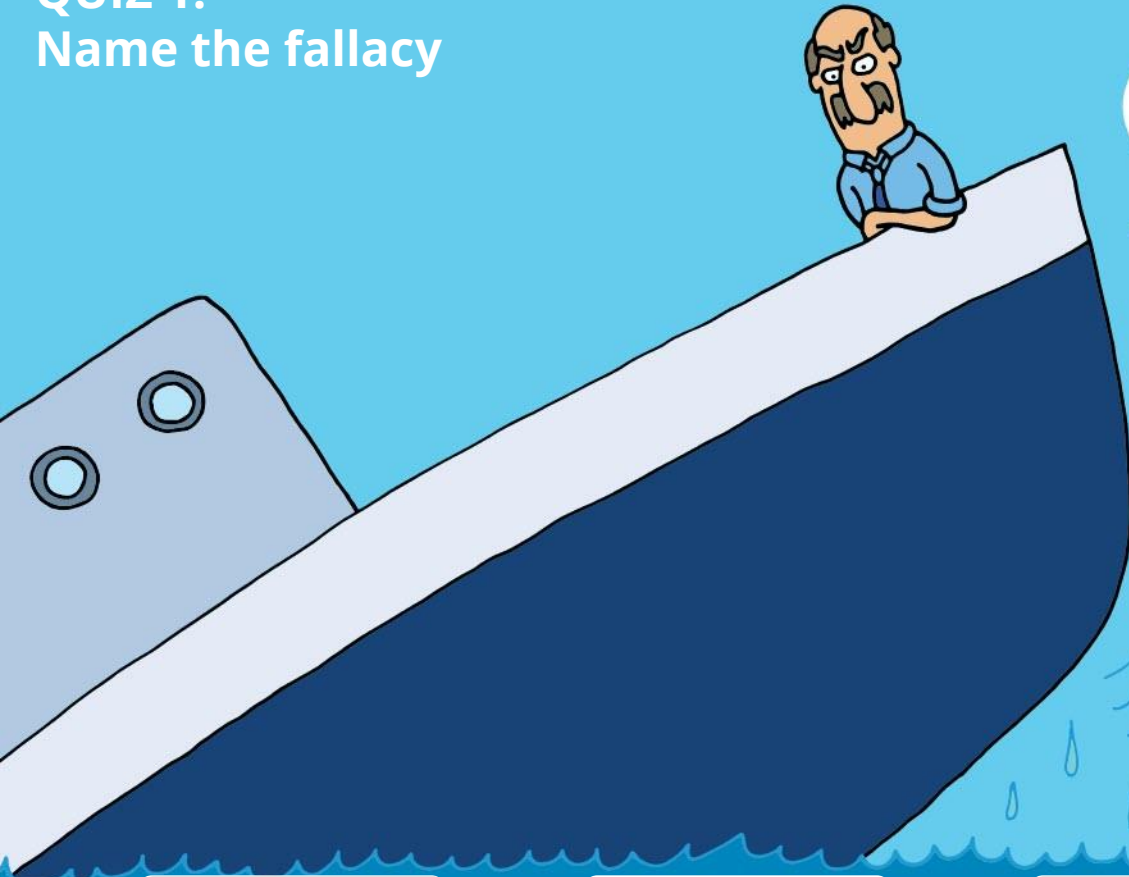
 Cherry picking

 Fake debate


 Impossible expectations


QUIZ 1:


Name the fallacy




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 Ad hominem

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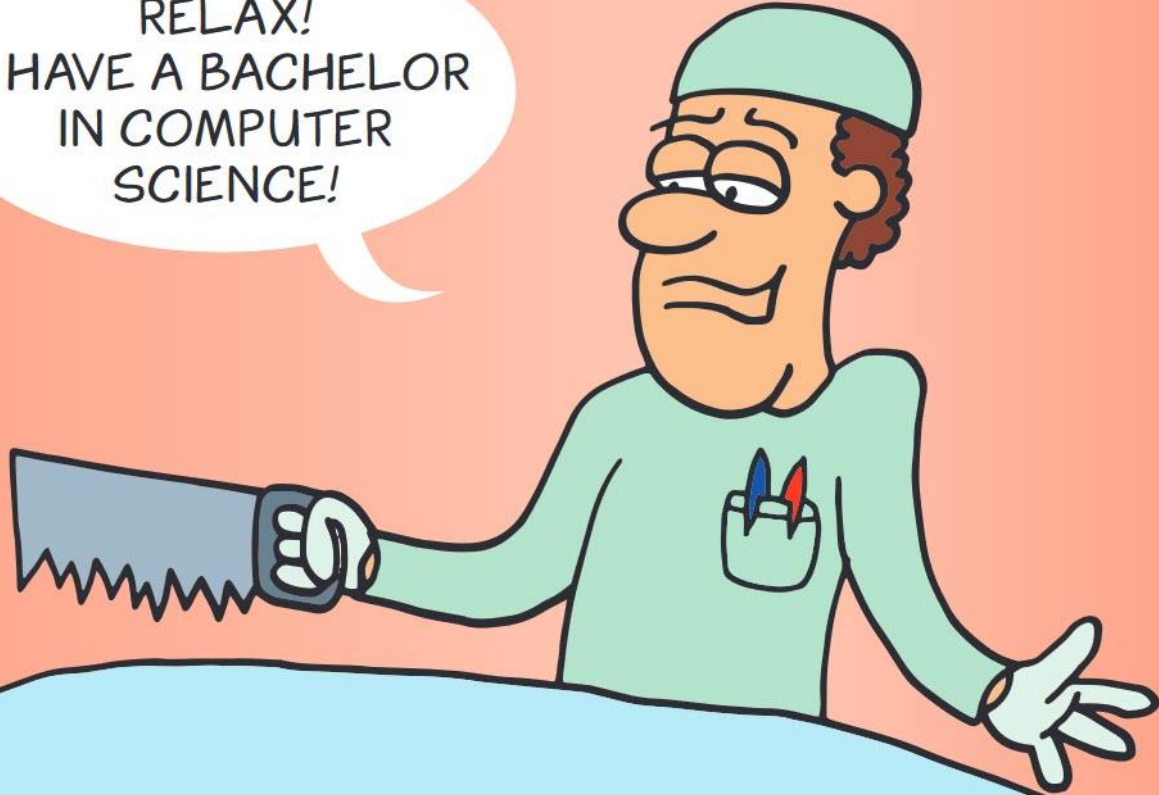
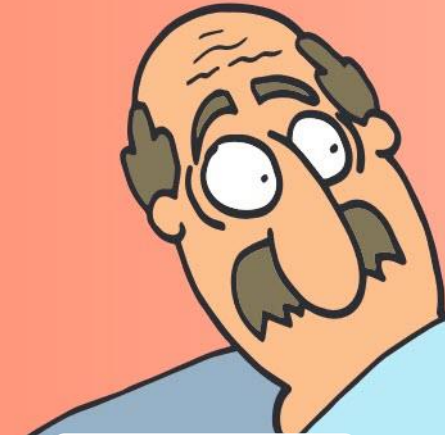
 False balance

 Impossible expectations

QUIZ 2:
Name the fallacy



RELAX!
I HAVE A BACHELOR
IN COMPUTER
SCIENCE!



Overriding
suspicion



Lowered
expectations



False
choice

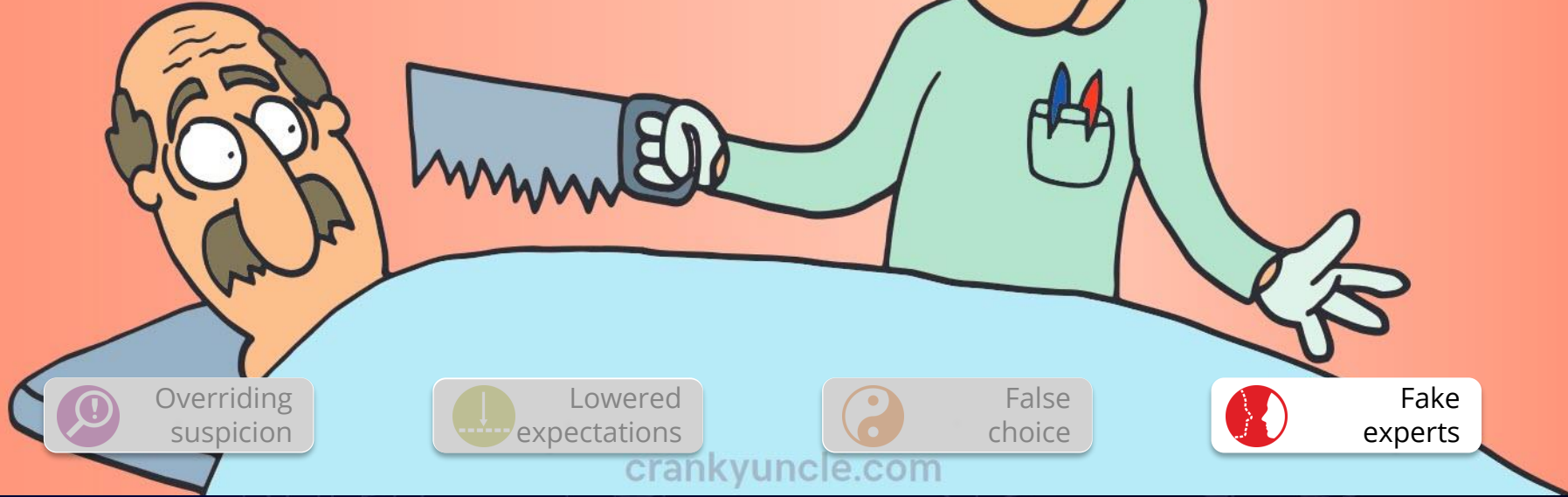



Fake
experts


QUIZ 2:
Name the fallacy





RELAX!
I HAVE A BACHELOR
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 Overriding
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 Lowered
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 Fake
experts

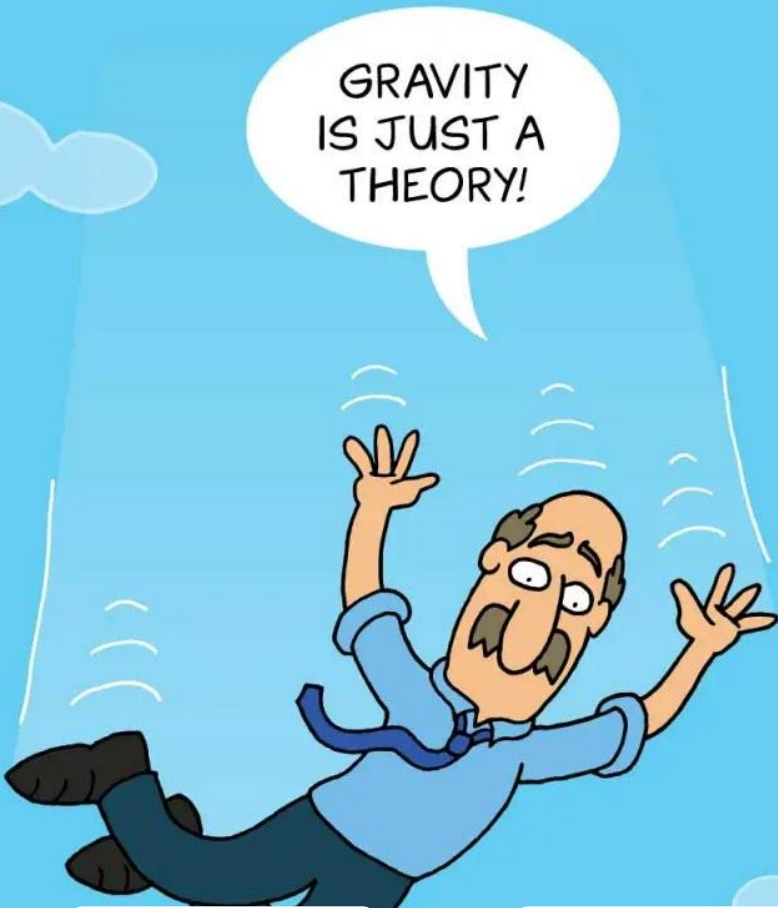
QUIZ 3:
Name the fallacy

 Ambiguity

 Conspiracy theory


 Red herring


 Cherry picking





QUIZ 3:
Name the fallacy

GRAVITY
IS JUST A
THEORY!

 Ambiguity

 Conspiracy theory

 Red herring

 Cherry picking

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 4:
Multiple-choice

**Which argument is an
ad hominem attack?**

**Conspiracy
theory**

A

Climate scientists are just
in it for the money!

**Impossible
expectations**

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



Fake
debate



Conspiracy
theory



Anecdote



Ad
hominem

QUIZ 5:
Name the fallacy

IT'S
COLD...

...GLOBAL
WARMING DOESN'T
EXIST!



Fake
debate



Conspiracy
theory



Anecdote



Ad
hominem

QUIZ 6:
Name the fallacy

YOU'LL HIT
THE GROUND IN 12
TO 15 SECONDS.



GET BACK TO
ME WHEN YOU HAVE
MORE CERTAINTY!



Quote
mining



Impossible
expectations



Fake
expert



False
choice

QUIZ 6:
Name the fallacy

YOU'LL HIT
THE GROUND IN 12
TO 15 SECONDS.



GET BACK TO
ME WHEN YOU HAVE
MORE CERTAINTY!



Quote
mining



Impossible
expectations



False
choice



Fake
expert

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?**

Anecdote

A

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

B

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

Single cause

C

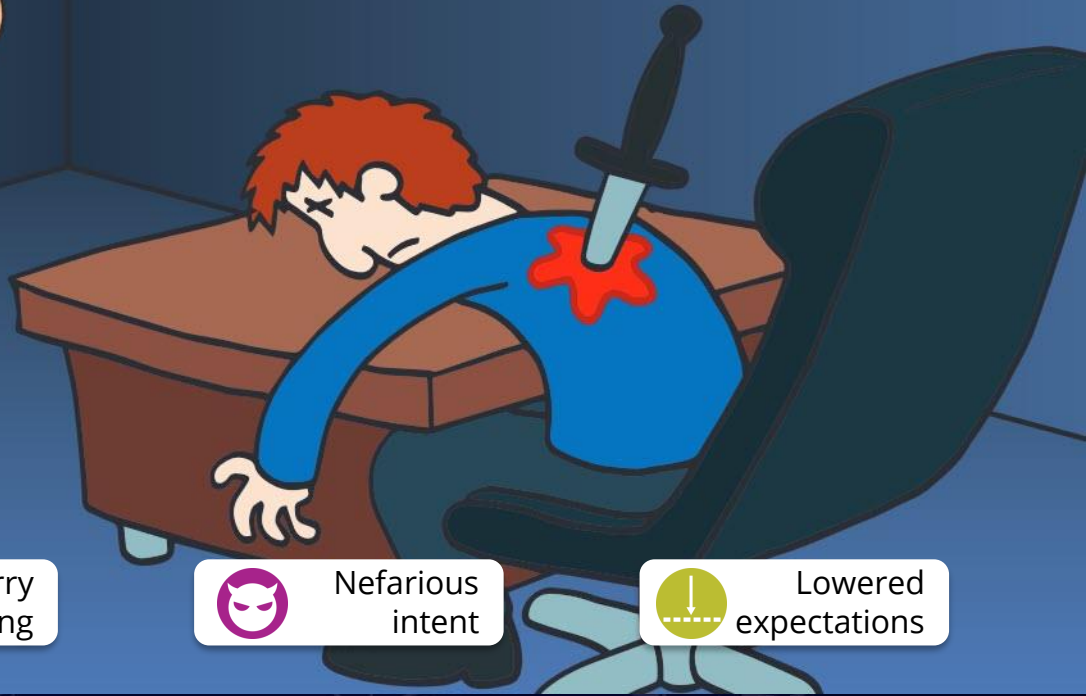
You're just overweight because you don't exercise enough.

QUIZ 8:

Name the fallacy

THIS PERSON DIED OF NATURAL CAUSES...

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



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.



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!



Fake
debate



Conspiracy
theory



Slothful
induction



False
choice


QUIZ 10:


Name the fallacy


SURE, YOU CAN DRINK THE WATER. IT ONLY HAS A TRACE OF ARSENIC!



crankyuncle.com

 Red herring

 Anecdote

 Impossible expectations

 Magnified minorities


QUIZ 10:


Name the fallacy


SURE, YOU CAN DRINK THE WATER. IT ONLY HAS A TRACE OF ARSENIC!



crankyuncle.com

 Red herring

 Anecdote

 Impossible expectations

 Magnified minorities

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.

Single cause

C

Hot dogs are better than nothing.
Nothing is better than steak. Therefore
hot dogs are better than steak.

Ambiguity

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

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

Cranky Uncle to the rescue!



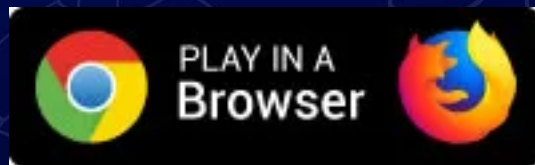
Understand cranky uncles by becoming a cranky uncle



<https://sks.to/crankyiphone>



<https://sks.to/crankyandroid>



<https://sks.to/crankybrowser>

Learn techniques of science denial



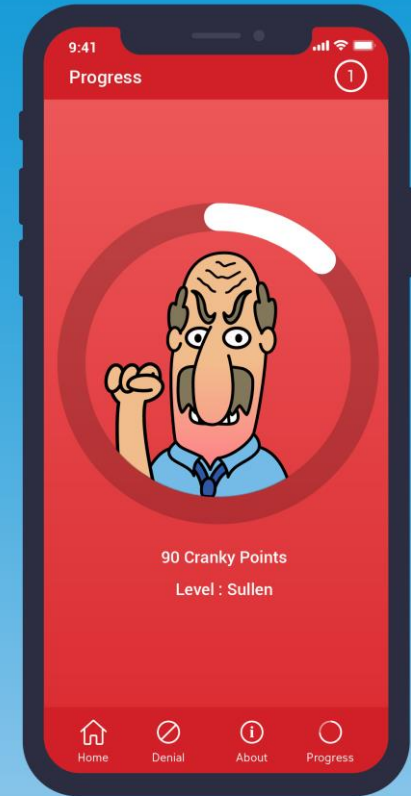
Cranky Uncle mentors you on how to deny science



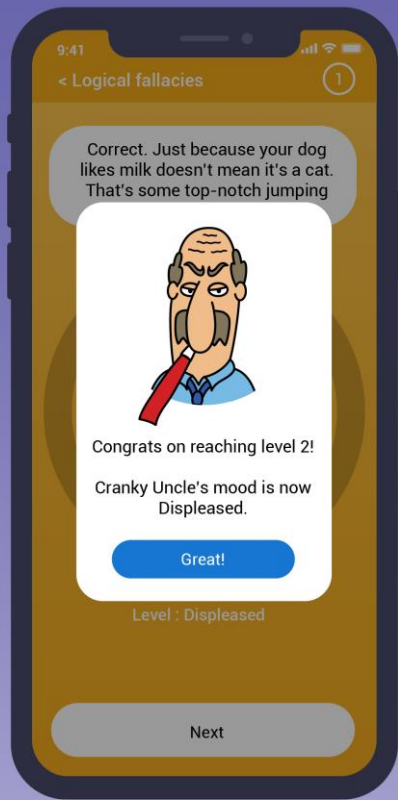
Practise spotting denial techniques in cartoon quizzes



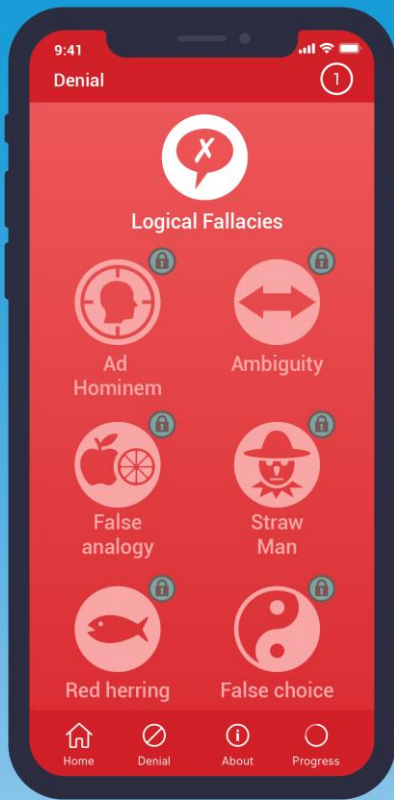
Build up cranky points



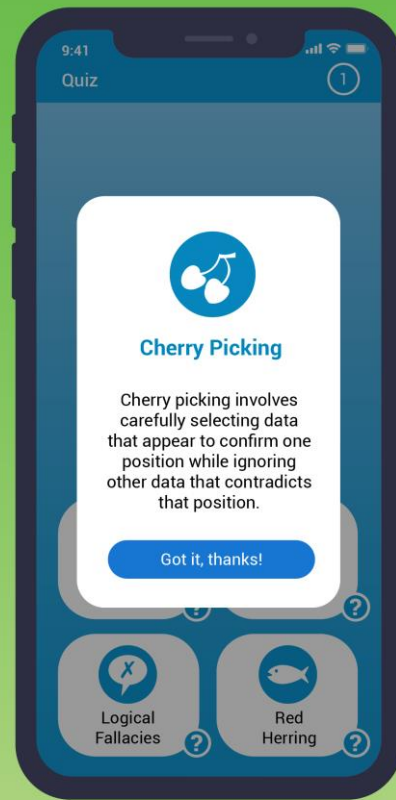
Level up and see your mood get crankier!



Unlock new denial techniques



Definitions of each denial technique at your fingertips



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

Game is available for iPhone, Android and Browser



sks.to/crankyiphone



sks.to/crankyandroid



sks.to/crankybrowser

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

Email - baerbelw@skepticalscience.com

Web - <https://skepticalscience.com>

More about me - <https://sks.to/BaerbelW>



Skeptical Science

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>