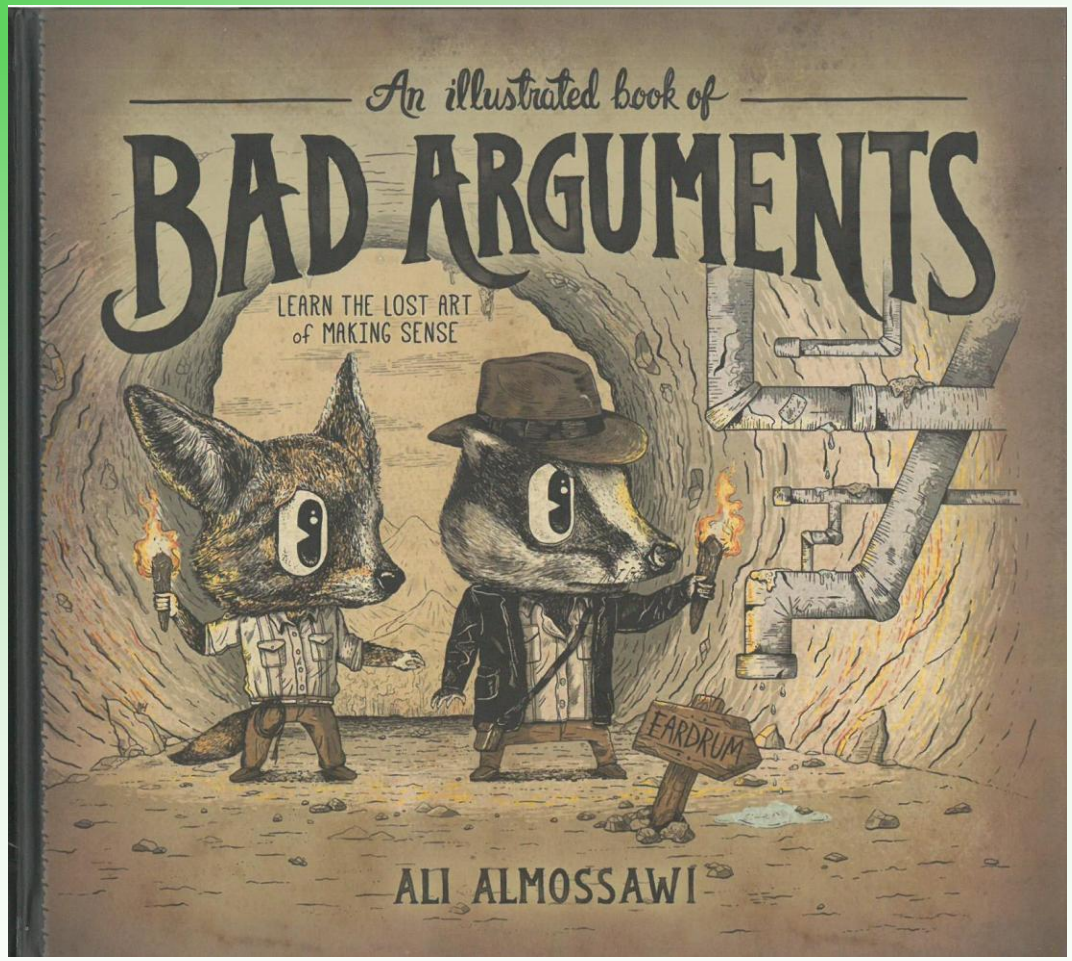
The Field of Logical Reasoning:

(& The back 40 of Bad Arguments)

Adapted from: An Illustrated Book of Bad Arguments: Learn the lost art of making sense by Ali Almossawi



*Not, by any stretch of the imagination, the only source on this topic…

Disclaimer

This is not the only (or even best) approach to thinking, examining, analyzing creating policy, positions or arguments.

"*Logic no more explains how we think than grammar explains how we speak.*"

M. Minsky

Other Ways…

- Logical Reasoning comes from Age-Old disciplines/practices of REASON.
- But REASON is only ONE human characteristic
- Other methods/processes are drawn from the strengths of other characteristics

Other Human Characteristics:

- John Ralston Saul (Unconscious Civilization, 1995) lists SIX Human Characteristics
- They are (alphabetically, so as not to create a hierarchy):

  - **Common Sense**
  - **Creativity**
  - **Ethics**
  - **Intuition**
  - **Memory**
  - **Reason**

Reason is not Superior

- While this presentation focuses on the practices of REASON, it is necessary to actively engage our collective notions rooted in:
    - Common Sense (everyday understandings)
    - Creativity (new, novel approaches)
    - Ethics (relative moral high-ground)
    - Intuition (gut instinct)
    - Memory (history, stories)

…in order to have a holistic/inclusive approach to reasonable doubt and public participation.

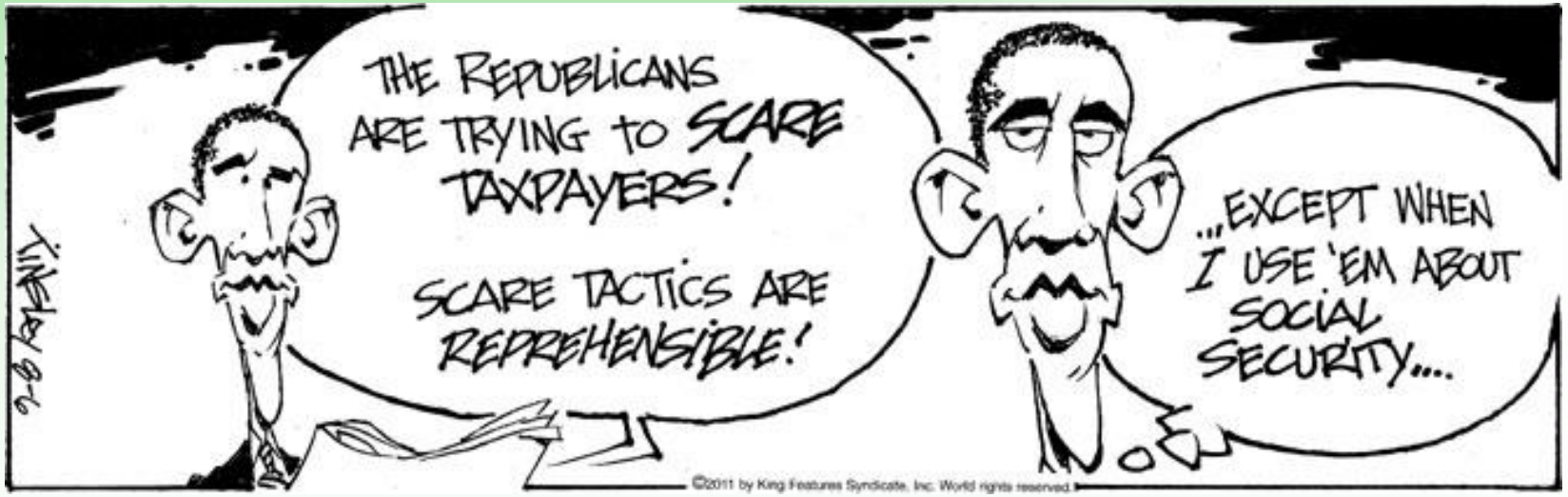
However:

- Given the west's weakness for Reason and the relative dominance of Reason in public policy, we need to equip ourselves and understand its use and misuse.

- Enter: The Field of Logical Reasoning vs. Logical Fallacy

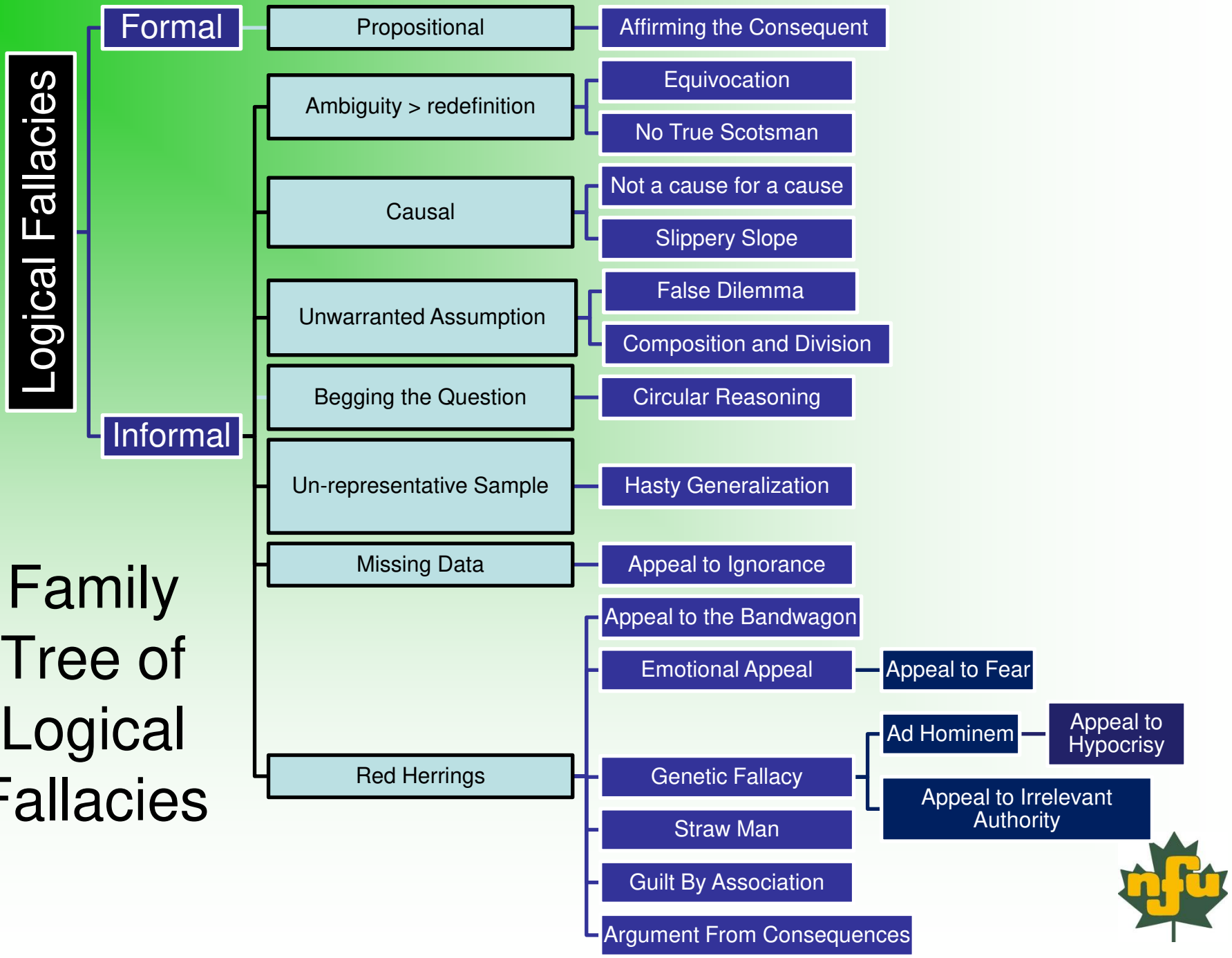
Appeal to Hypocrisy

Defending an error in one's reasoning by pointing out that one's opponent has made the same error.



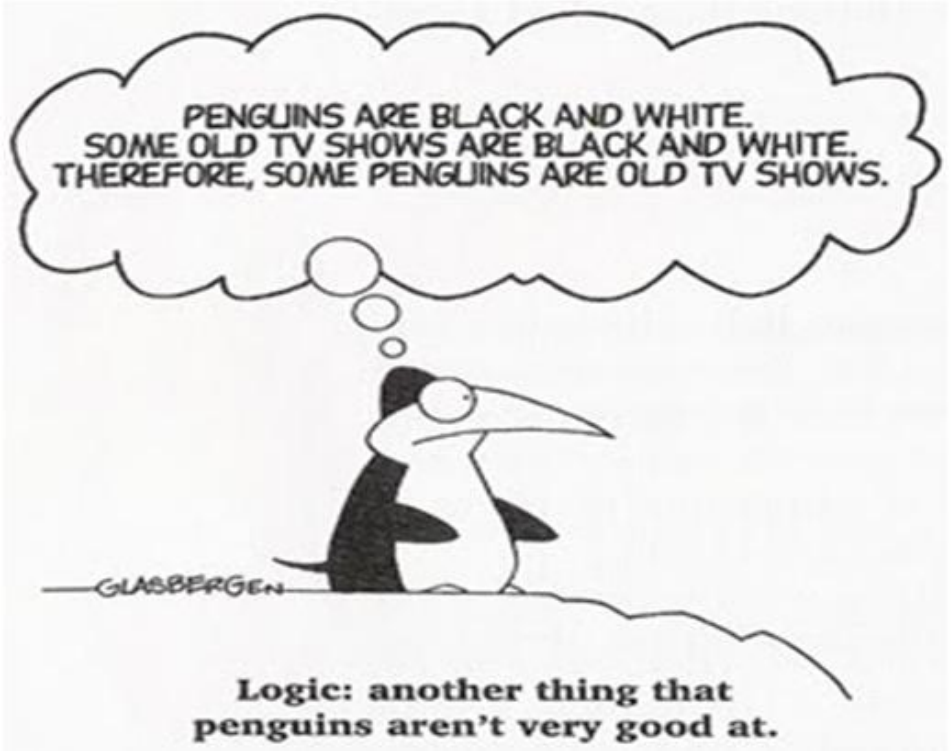
What's a Logical Fallacy?

- ALL logical fallacies are a form of *Non-Sequitur*
- Non sequitur, in formal logic, is an argument in which its conclusion does not follow from its premises. Wikipedia
- In a *non sequitur*, the conclusion could be either true or false, but the argument is fallacious because there is a disconnection between the premise and the conclusion.


Logical Fallacies
Formal
Propositional
Affirming the Consequent
Informal
Ambiguity > redefinition
Equivocation
No True Scotsman
Causal
Not a cause for a cause
Slippery Slope
Unwarranted Assumption
False Dilemma
Composition and Division
Begging the Question
Circular Reasoning
Un-representative Sample
Hasty Generalization
Missing Data
Appeal to Ignorance
Red Herrings
Appeal to the Bandwagon
Emotional Appeal
Appeal to Fear
Genetic Fallacy
Ad Hominem
Appeal to Hypocrisy
Appeal to Irrelevant Authority
Straw Man
Guilt By Association
Argument From Consequences
Family Tree of Logical Fallacies

Today's Workshop:

After a brief overview of some logical fallacies, we will ask you all to ponder on a logical fallacy you have heard used, recently, and highlight it for us all.



The Ten Commandments of Logic:

1) Thou shalt not assume “this” follows “that” when there is no logical connection. (*Non sequitur*)
2) Thou shalt not lay the burden of proof onto him that is questioning the claim. (*Burden of proof*)
3) Thou shalt not attack the person’s character, but the argument. (*Ad hominem*)
4) Thou shalt not misrepresent or exaggerate a person’s argument in order to make it easier to attack. (*Straw man fallacy*)
5) Thou shalt not use small numbers to represent the all. (*Hasty generalization*)
6) Thou shalt not argue thy position by assuming one of its premises is true. (*Begging the question*)
7) Thou shalt not claim that because something occurred before, it must be the cause. (*Post hoc/False cause*)
8) Thou shalt not reduce the argument down to two possibilities. (*False dichotomy*)
9) Thou shalt not argue that because of our ignorance, a claim must be true or false. (*Ad ignorantum*)
10) Thou shalt not argue that because a premise is popular, therefore it must be true. (*Bandwagon fallacy*)

Formal

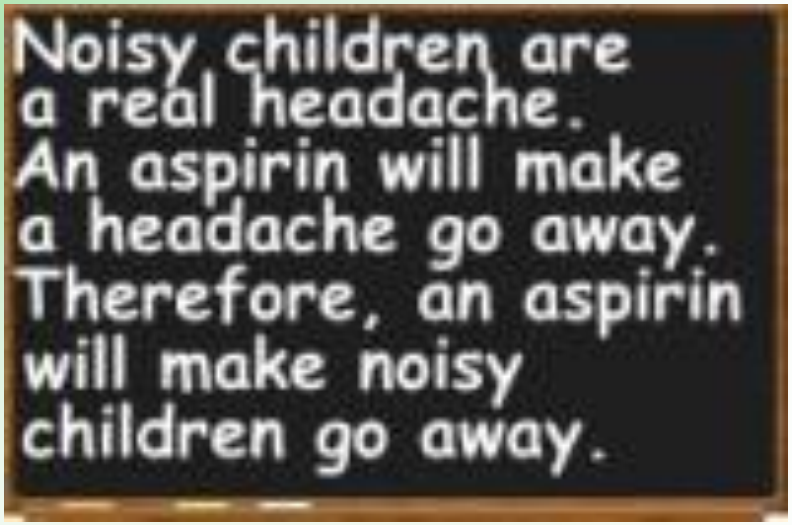
- Affirming the Consequent

2 = a number

1 = a number

---

2 = 1



Affirming the Consequent

Informal

- **Ambiguity**
  - -No True Scotsman
  - -Equivocation
- **Causal**
  - -Slippery Slope
  - -Not a Cause for a Cause
- **Unwarranted Assumption**
  - -False Dilemma
  - -Composition and Division
- **Begging the Question**
  - -Circular Reasoning
- **Unrepresentative Sample/Weak Analogy**
  - -Hasty Generalization
- **Missing Data**
  - -Appeal to Ignorance

No True Scotsman

Equivocation

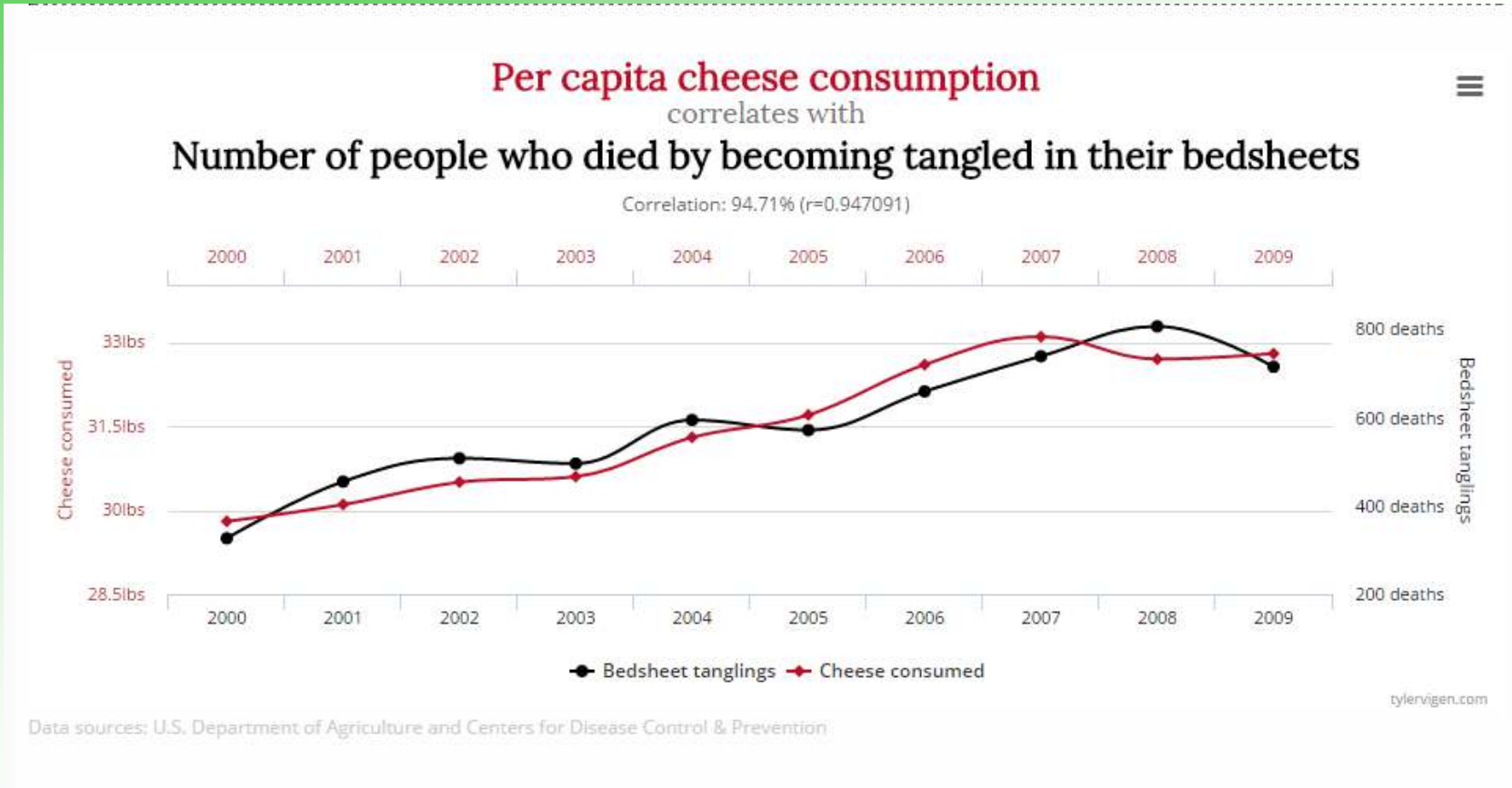
Thou shalt not change the meaning of a word mid argument.

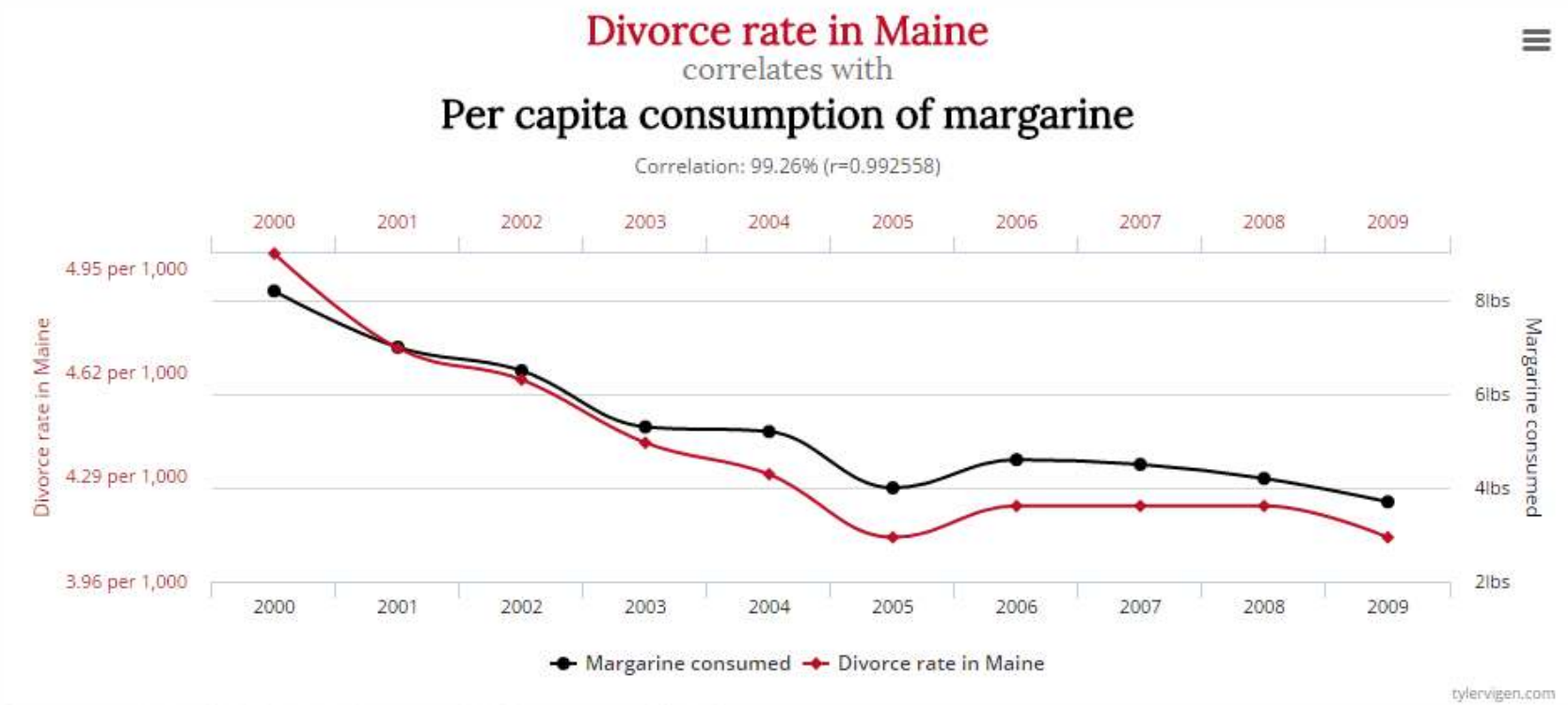
Slippery Slope

Thou shalt not predict doomsday just because you don't like the idea.

Not a Cause for a Cause

Thou shalt not claim that because something occurred before, it must be the cause.

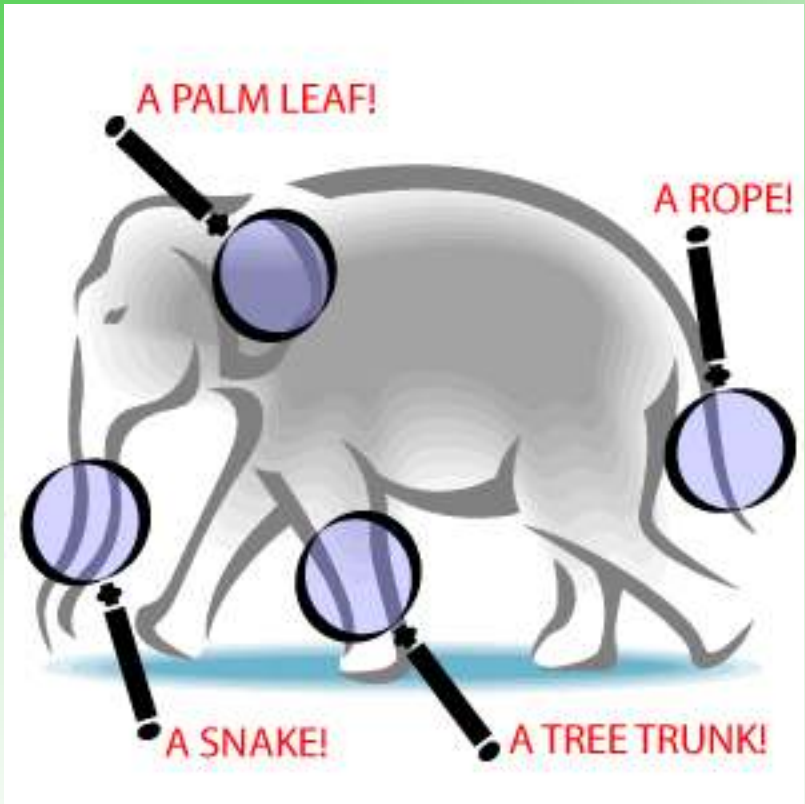



Divorce rate in Maine
correlates with
Per capita consumption of margarine
Correlation: 99.26% (r=0.992558)
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
4.95 per 1,000
4.62 per 1,000
4.29 per 1,000
3.96 per 1,000
Divorce rate in Maine
8lbs
6lbs
4lbs
2lbs
Margarine consumed
Margarine consumed
Divorce rate in Maine
tylervigen.com
Data sources: National Vital Statistics Reports and U.S. Department of Agriculture

False Dilemma/Dichotomy

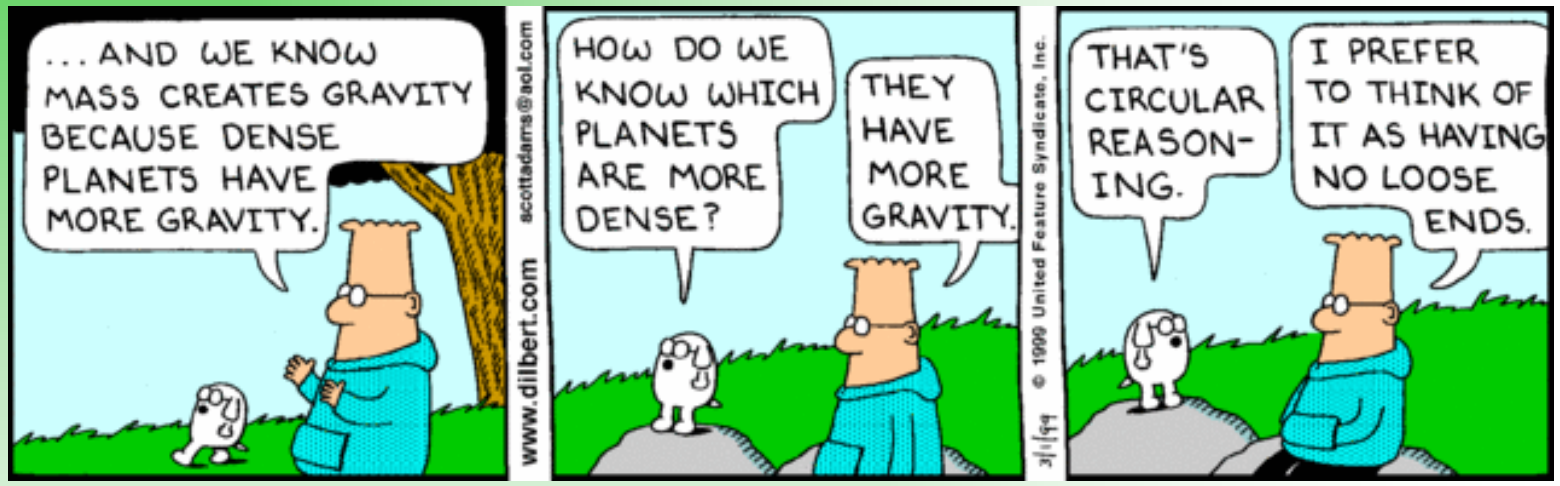
Thou shalt not reduce the argument down to two possibilities.

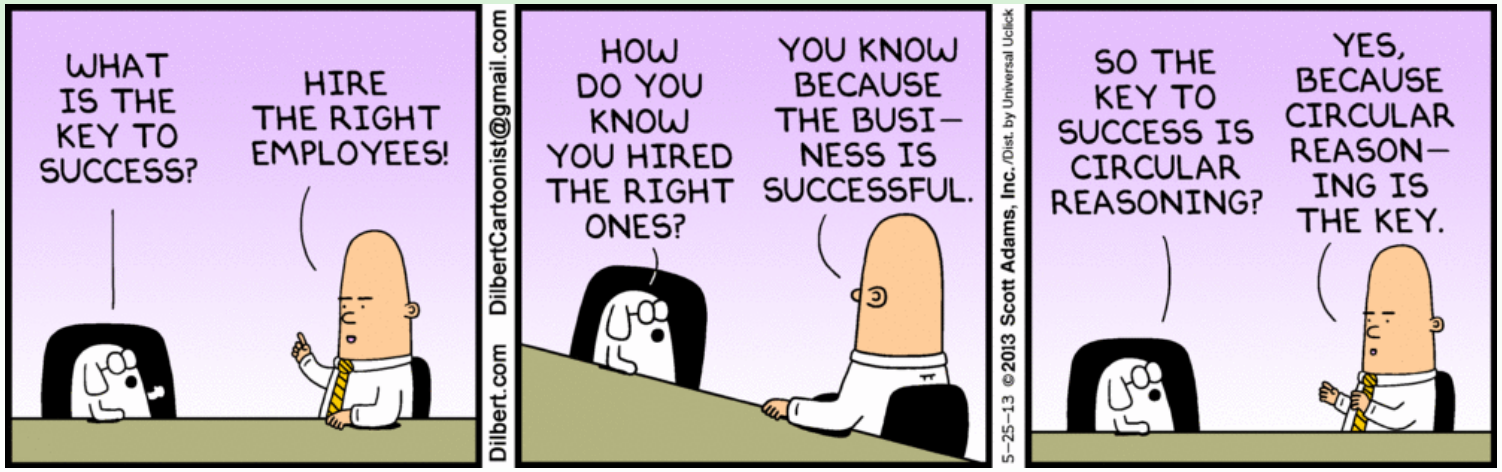
Composition and Division



Circular Reasoning (Begging the Question)

Thou shalt not argue thy position by assuming one of its premises is true.





Hasty Generalization

Thou shalt not use small numbers to represent the all.

My dad smoked all his life and hasn't gotten cancer, I don't think smoking can be that bad for you.

Appeal to Ignorance

Thou shalt not argue that because of our ignorance, a claim must be true or false.

Informal: Red Herrings

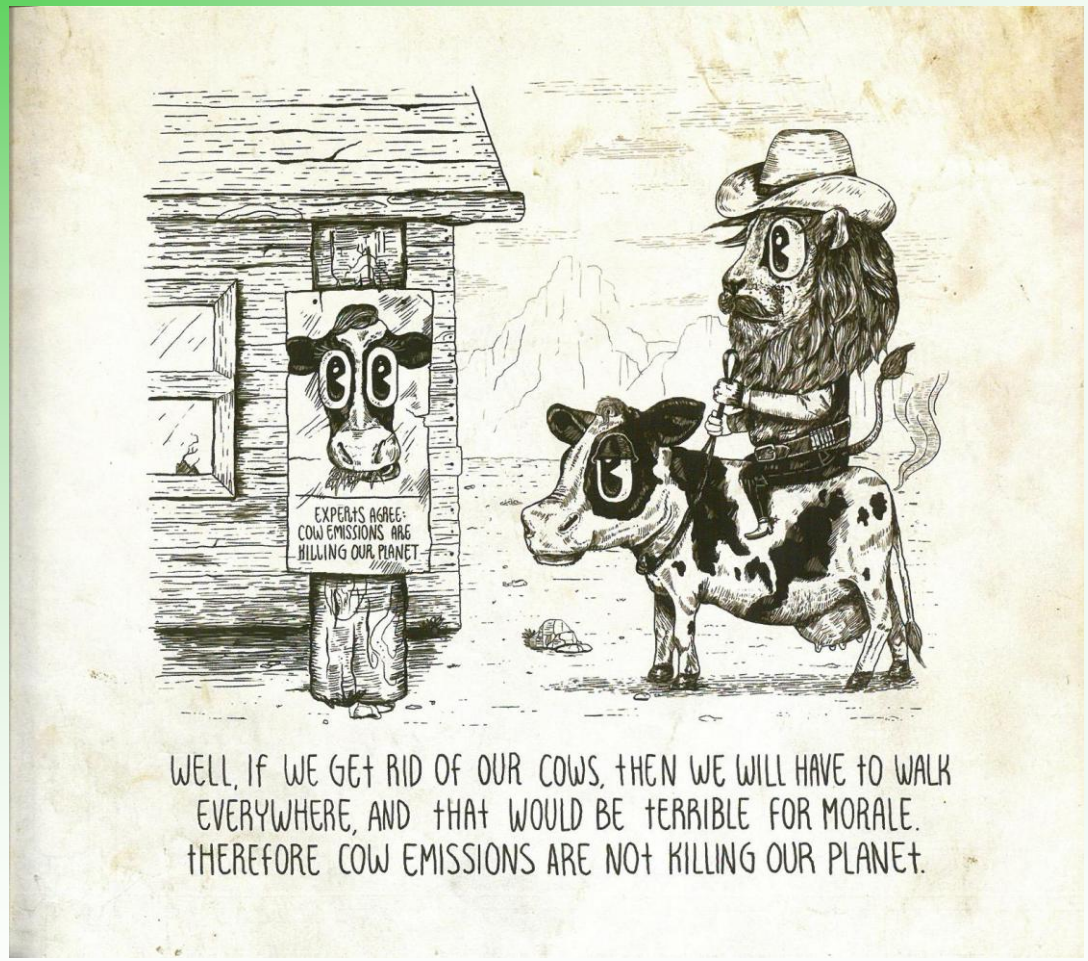
- Appeal to Bandwagon
- (Emotional) Appeal to Fear
- Argument from Consequences
- Guilt by Association
- Straw Man
- Genetic Fallacy; Appeal to Irrelevant Authority
- Ad Hominum; Appeal to Hypocrisy

Appeal to the Bandwagon

Thou shalt not argue that because a premise is popular, therefore it must be true.

Appeal to Fear

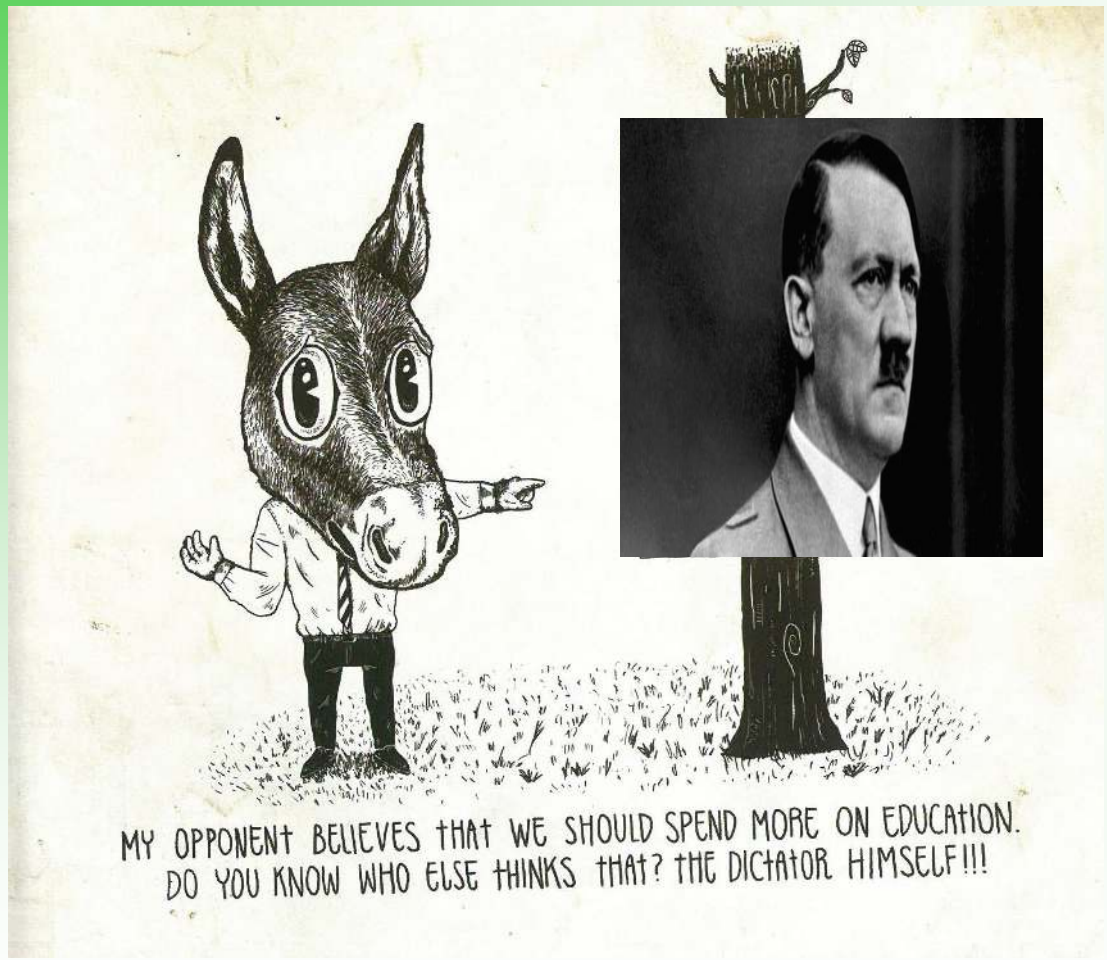
Argument from the Consequence



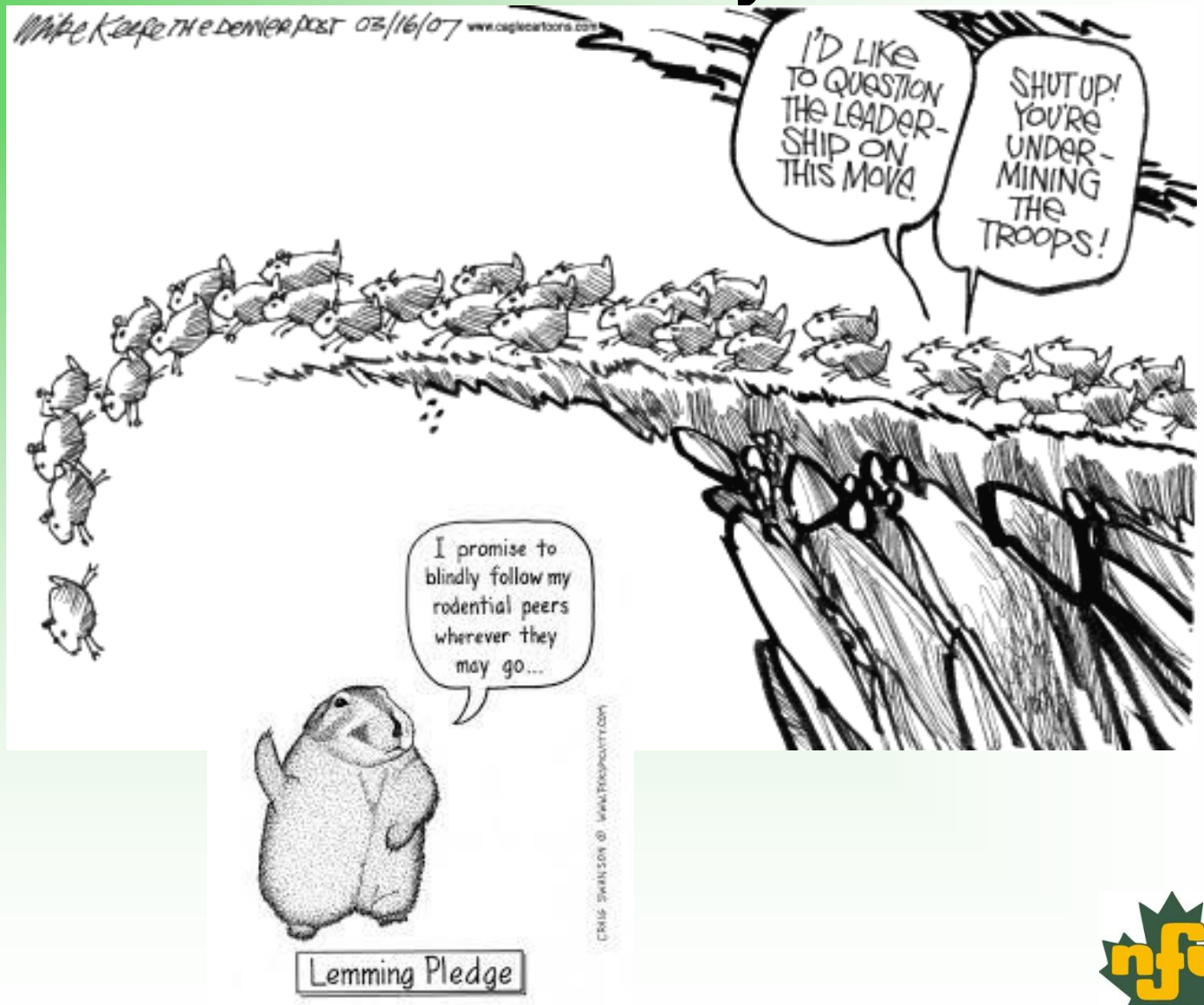
Straw Man

Thou shalt not misrepresent or exaggerate a person's argument in order to make it easier to attack.

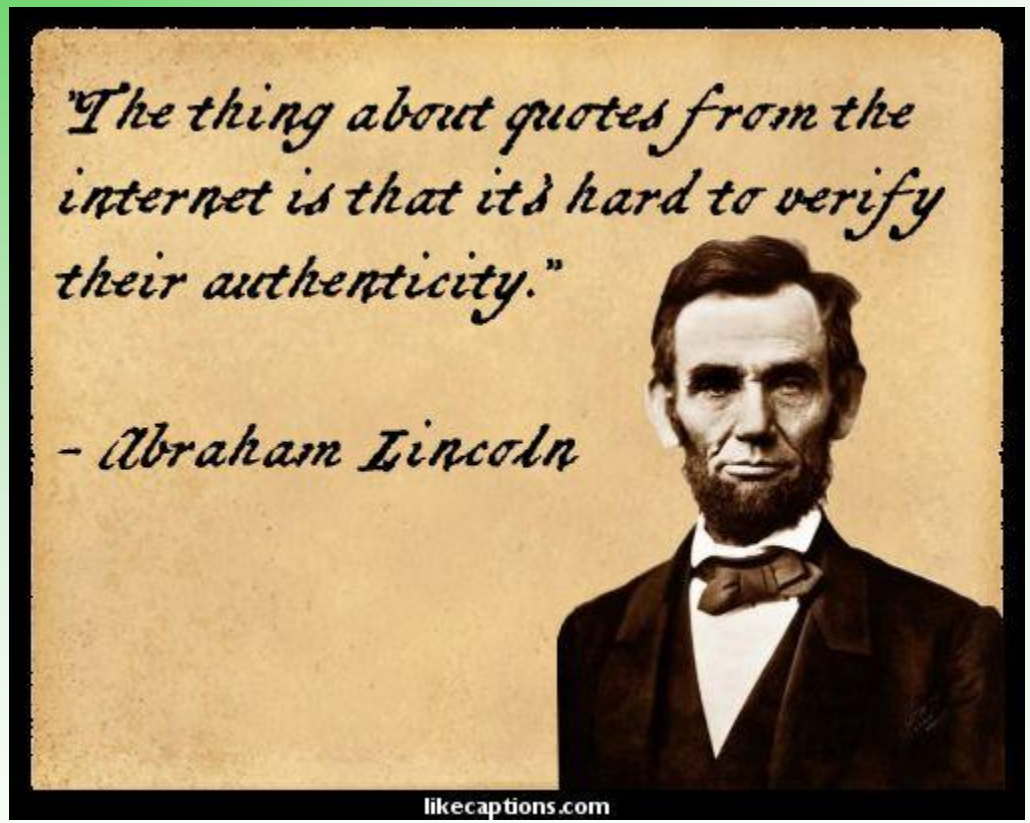
Guilt by Association



Genetic Fallacy

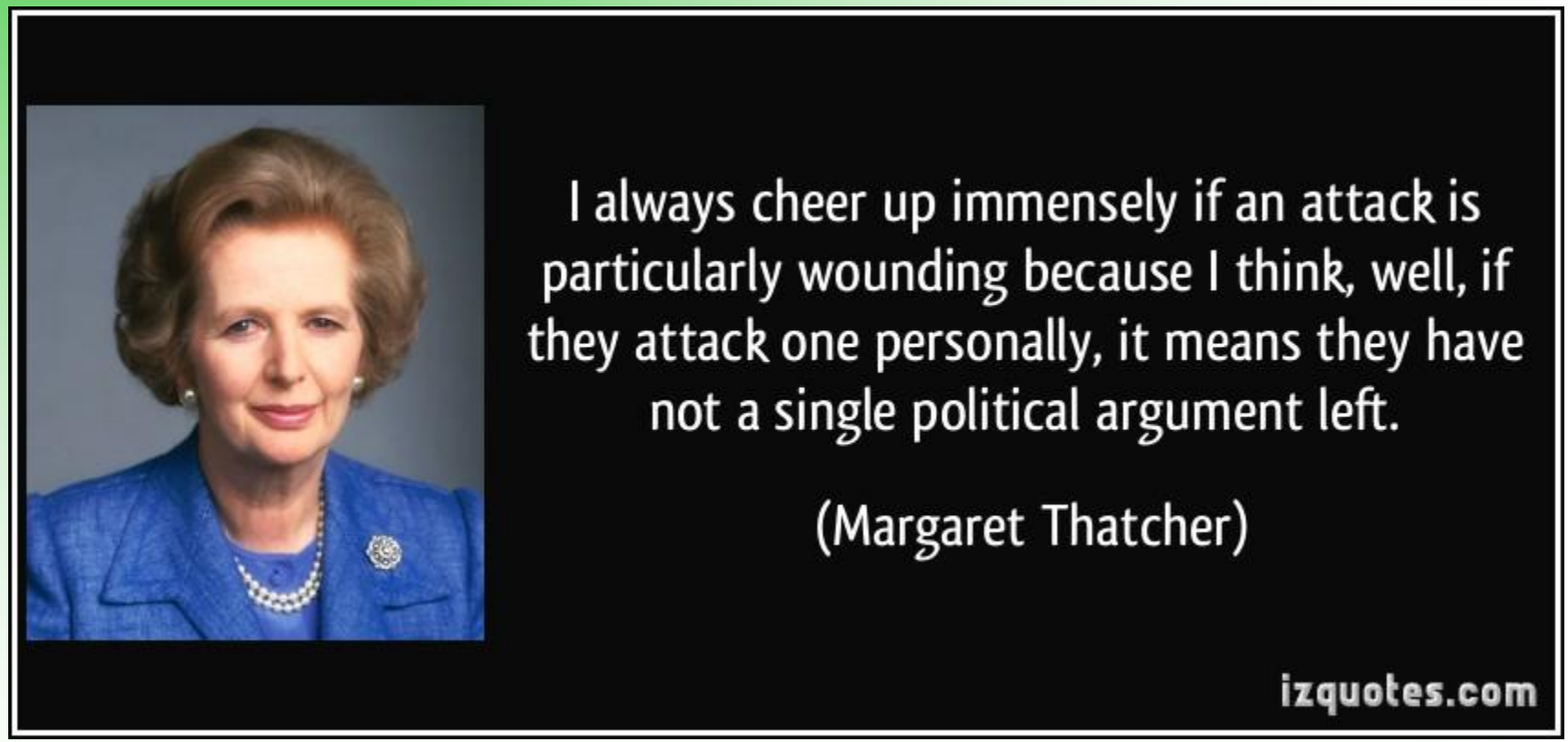


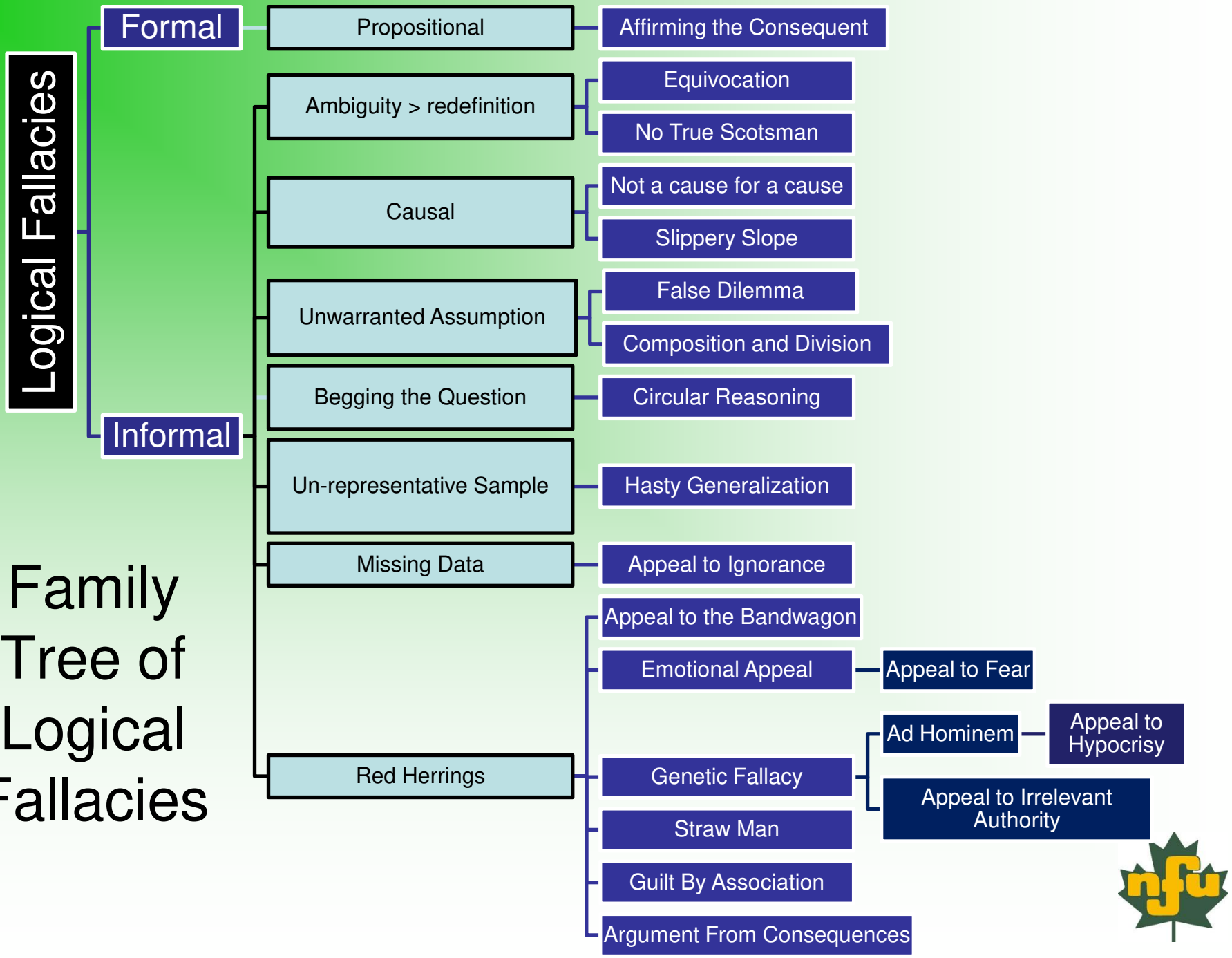
Appeal to Irrelevant Authority

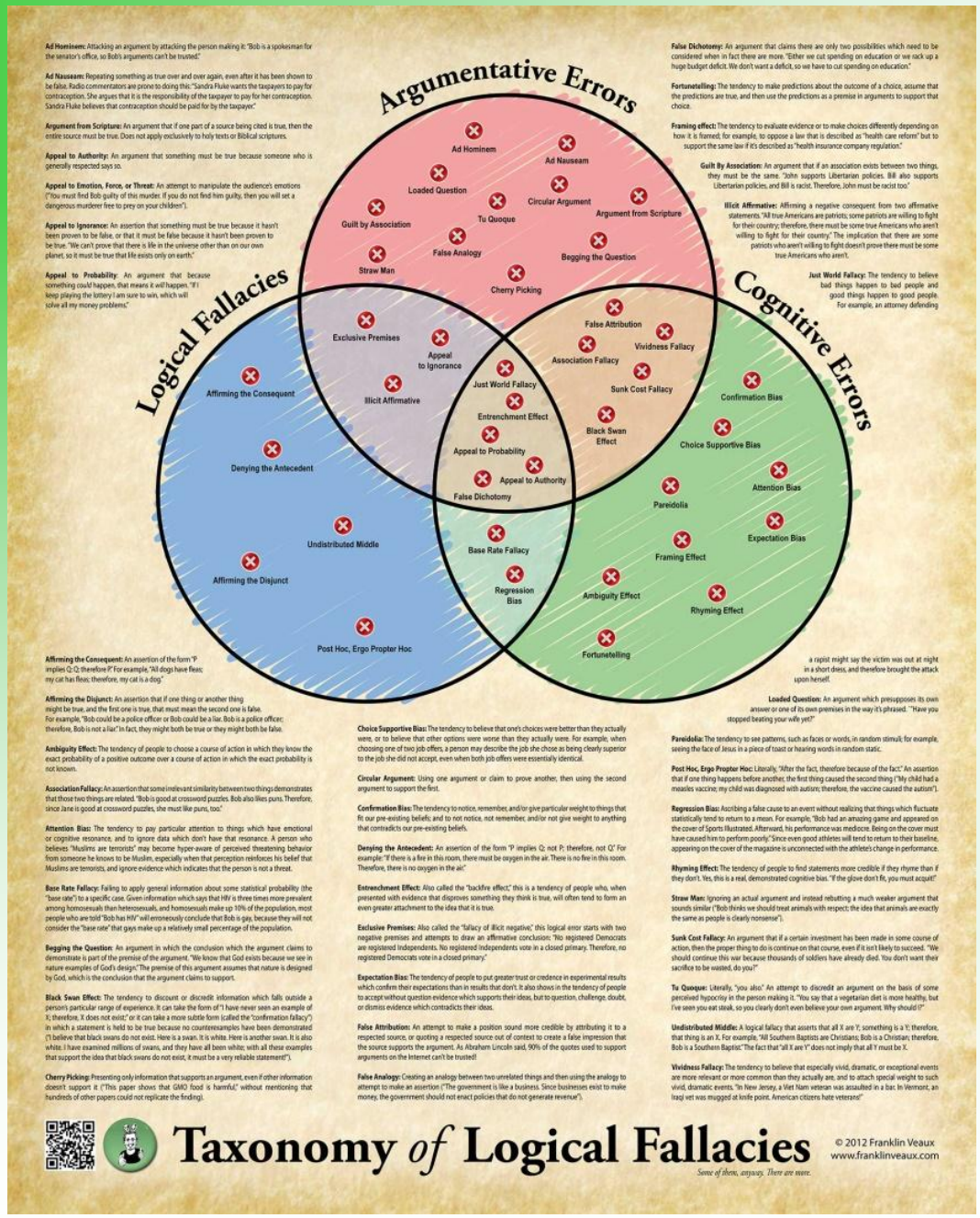


Ad Hominem

Thou shalt not attack the person's character, but the argument.




Logical Fallacies
Formal
Propositional
Affirming the Consequent
Informal
Ambiguity > redefinition
Equivocation
No True Scotsman
Causal
Not a cause for a cause
Slippery Slope
Unwarranted Assumption
False Dilemma
Composition and Division
Begging the Question
Circular Reasoning
Un-representative Sample
Hasty Generalization
Missing Data
Appeal to Ignorance
Red Herrings
Appeal to the Bandwagon
Emotional Appeal
Appeal to Fear
Genetic Fallacy
Ad Hominem
Appeal to Hypocrisy
Appeal to Irrelevant Authority
Straw Man
Guilt By Association
Argument From Consequences
Family Tree of Logical Fallacies



Ad Hominem: Attacking an argument by attacking the person making it: "Bob is a spokesman for the senator's office, so Bob's arguments can't be trusted."

Ad Nauseam: Repeating something as true over and over again, even after it has been shown to be false. Radio commentators are prone to doing this: "Sandra Fluke wants the taxpayers to pay for contraception. She argues that it is the responsibility of the taxpayer to pay for her contraception. Sandra Fluke believes that contraception should be paid for by the taxpayer."

Argument from Scripture: An argument that if one part of a source being cited is true, then the entire source must be true. Does not apply exclusively to holy texts or Biblical scriptures.

Appeal to Authority: An argument that something must be true because someone who is generally respected says so.

Appeal to Emotion, Force, or Threat: An attempt to manipulate the audience's emotions ("You must find Bob guilty of this murder. If you do not find him guilty, then you will set a dangerous murderer free to prey on your children").

Appeal to Ignorance: An assertion that something must be true because it hasn't been proven to be false, or that it must be false because it hasn't been proven to be true. "We can't prove that there is life in the universe other than on our own planet, so it must be true that life exists only on earth."

Appeal to Probability: An argument that because something could happen, that means it will happen. "If I keep playing the lottery I am sure to win, which will solve all my money problems."

False Dichotomy: An argument that claims there are only two possibilities which need to be considered when in fact there are more. "Either we cut spending on education or we rack up a huge budget deficit. We don't want a deficit, so we have to cut spending on education."

Fortunetelling: The tendency to make predictions about the outcome of a choice, assume that the predictions are true, and then use the predictions as a premise in arguments to support that choice.

Framing effect: The tendency to evaluate evidence or to make choices differently depending on how it is framed; for example, to oppose a law that is described as "health care reform" but to support the same law if it's described as "health insurance company regulation."

Guilt By Association: An argument that if an association exists between two things, they must be the same. "John supports Libertarian policies. Bill also supports Libertarian policies, and Bill is racist. Therefore, John must be racist too."

Illicit Affirmative: Affirming a negative consequent from two affirmative statements. "All true Americans are patriots; some patriots are willing to fight for their country; therefore, there must be some true Americans who aren't willing to fight for their country." The implication that there are some patriots who aren't willing to fight doesn't prove there must be some true Americans who aren't.

Just World Fallacy: The tendency to believe bad things happen to bad people and good things happen to good people. For example, an attorney defending a rapist might say the victim was out at night in a short dress, and therefore brought the attack upon herself.

Affirming the Consequent: An assertion of the form "P implies Q; Q; therefore P." For example, "All dogs have fleas; my cat has fleas; therefore, my cat is a dog."

Affirming the Disjunct: An assertion that if one thing or another thing might be true, and the first one is true, that must mean the second one is false. For example, "Bob could be a police officer or Bob could be a liar. Bob is a police officer; therefore, Bob is not a liar." In fact, they might both be true or they might both be false.

Ambiguity Effect: The tendency of people to choose a course of action in which they know the exact probability of a positive outcome over a course of action in which the exact probability is not known.

Association Fallacy: An assertion that some irrelevant similarity between two things demonstrates that those two things are related. "Bob is good at crossword puzzles. Bob also likes puns. Therefore, since Jane is good at crossword puzzles, she must like puns, too."

Attention Bias: The tendency to pay particular attention to things which have emotional or cognitive resonance, and to ignore data which don't have that resonance. A person who believes "Muslims are terrorists" may become hyper-aware of perceived threatening behavior from someone he knows to be Muslim, especially when that perception reinforces his belief that Muslims are terrorists, and ignore evidence which indicates that the person is not a threat.

Base Rate Fallacy: Failing to apply general information about some statistical probability (the "base rate") to a specific case. Given information which says that HIV is three times more prevalent among homosexuals than heterosexuals, and homosexuals make up 10% of the population, most people who are told "Bob has HIV" will erroneously conclude that Bob is gay, because they will not consider the "base rate" that gays make up a relatively small percentage of the population.

Begging the Question: An argument in which the conclusion which the argument claims to demonstrate is part of the premise of the argument. "We know that God exists because we see in nature examples of God's design." The premise of this argument assumes that nature is designed by God, which is the conclusion that the argument claims to support.

Black Swan Effect: The tendency to discount or discredit information which falls outside a person's particular range of experience. It can take the form of "I have never seen an example of X; therefore, X does not exist," or it can take a more subtle form (called the "confirmation fallacy") in which a statement is held to be true because no counterexamples have been demonstrated ("I believe that black swans do not exist. Here is a swan. It is white. Here is another swan. It is also white. I have examined millions of swans, and they have all been white; with all these examples that support the idea that black swans do not exist, it must be a very reliable statement").

Cherry Picking: Presenting only information that supports an argument, even if other information doesn't support it ("This paper shows that GMO food is harmful," without mentioning that hundreds of other papers could not replicate the finding).

Choice Supportive Bias: The tendency to believe that one's choices were better than they actually were, or to believe that other options were worse than they actually were. For example, when choosing one of two job offers, a person may describe the job she chose as being clearly superior to the job she did not accept, even when both job offers were essentially identical.

Circular Argument: Using one argument or claim to prove another, then using the second argument to support the first.

Confirmation Bias: The tendency to notice, remember, and/or give particular weight to things that fit our pre-existing beliefs; and to not notice, not remember, and/or not give weight to anything that contradicts our pre-existing beliefs.

Denying the Antecedent: An assertion of the form "P implies Q; not P; therefore, not Q." For example: "If there is a fire in this room, there must be oxygen in the air. There is no fire in this room. Therefore, there is no oxygen in the air."

Entrenchment Effect: Also called the "backfire effect," this is a tendency of people who, when presented with evidence that disproves something they think is true, will often tend to form an even greater attachment to the idea that it is true.

Exclusive Premises: Also called the "fallacy of illicit negative," this logical error starts with two negative premises and attempts to draw an affirmative conclusion: "No registered Democrats are registered Independents. No registered Independents vote in a closed primary. Therefore, no registered Democrats vote in a closed primary."

Expectation Bias: The tendency of people to put greater trust or credence in experimental results which confirm their expectations than in results that don't. It also shows in the tendency of people to accept without question evidence which supports their ideas, but to question, challenge, doubt, or dismiss evidence which contradicts their ideas.

False Attribution: An attempt to make a position sound more credible by attributing it to a respected source, or quoting a respected source out of context to create a false impression that the source supports the argument. As Abraham Lincoln said, 90% of the quotes used to support arguments on the Internet can't be trusted!

False Analogy: Creating an analogy between two unrelated things and then using the analogy to attempt to make an assertion ("The government is like a business. Since businesses exist to make money, the government should not enact policies that do not generate revenue").

Loaded Question: An argument which presupposes its own answer or one of its own premises in the way it's phrased. "Have you stopped beating your wife yet?"

Pareidolia: The tendency to see patterns, such as faces or words, in random stimuli; for example, seeing the face of Jesus in a piece of toast or hearing words in random static.

Post Hoc, Ergo Propter Hoc: Literally, "After the fact, therefore because of the fact." An assertion that if one thing happens before another, the first thing caused the second thing ("My child had a measles vaccine; my child was diagnosed with autism; therefore, the vaccine caused the autism").

Regression Bias: Ascribing a false cause to an event without realizing that things which fluctuate statistically tend to return to a mean. For example, "Bob had an amazing game and appeared on the cover of Sports Illustrated. Afterward, his performance was mediocre. Being on the cover must have caused him to perform poorly." Since even good athletes will tend to return to their baseline, appearing on the cover of the magazine is unconnected with the athlete's change in performance.

Rhyming Effect: The tendency of people to find statements more credible if they rhyme than if they don't. Yes, this is a real, demonstrated cognitive bias. "If the glove don't fit, you must acquit."

Straw Man: Ignoring an actual argument and instead rebutting a much weaker argument that sounds similar ("Bob thinks we should treat animals with respect; the idea that animals are exactly the same as people is clearly nonsense").

Sunk Cost Fallacy: An argument that if a certain investment has been made in some course of action, then the proper thing to do is continue on that course, even if it isn't likely to succeed. "We should continue this war because thousands of soldiers have already died. You don't want their sacrifice to be wasted, do you?"

Tu Quoque: Literally, "you also." An attempt to discredit an argument on the basis of some perceived hypocrisy in the person making it. "You say that a vegetarian diet is more healthy, but I've seen you eat steak, so you clearly don't even believe your own argument. Why should I?"

Undistributed Middle: A logical fallacy that asserts that all X are Y; something is a Y; therefore, that thing is an X. For example, "All Southern Baptists are Christians; Bob is a Christian; therefore, Bob is a Southern Baptist." The fact that "all X are Y" does not imply that all Y must be X.

Vividness Fallacy: The tendency to believe that especially vivid, dramatic, or exceptional events are more relevant or more common than they actually are, and to attach special weight to such vivid, dramatic events. "In New Jersey, a Viet Nam veteran was assaulted in a bar. In Vermont, an Iraqi vet was mugged at knife point. American citizens hate veterans!"

Loaded Question: An argument which presupposes its own answer or one of its own premises in the way it's phrased. "Have you stopped beating your wife yet?"

Taxonomy *of* Logical Fallacies

Some of them, anyway. There are more.

© 2012 Franklin Veaux
www.franklinveaux.com