

Helping students **CARE**:  
**C**ommonplace, **A**uthority, **R**eason and **E**xperience  
in developing student critical thinking.

Michael L. Connell. Ph.D.

**MENTORING MINDS:**  
Strategies to Help Students Think Critically



# The Cairn.

When I think of the little children learning  
In all the schools of the world,  
Learning in Danish, learning in Japanese  
That two and two are four, and where the rivers of the world  
Rise, and the names of the mountains and the principal cities,  
My heart breaks.  
Come up, children! Toss your little stones gaily  
On the great cairn of Knowledge!  
(Where lies what Eculid knew, a little grey stone,  
What Plato, what Pascal, what Galileo:  
Little grey stones, little grey stones on a cairn.)  
Tell me, what is the name of the highest mountain?  
Name me a crater of fire! a peak of snow!  
Name me the mountains on the moon!  
But the name of the mountain that you climb all day,  
Ask not your teacher that.

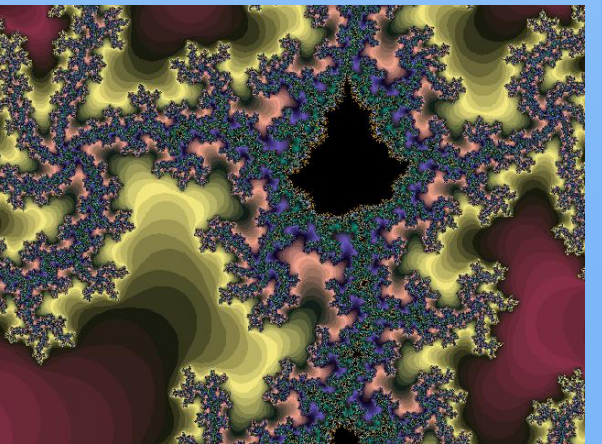
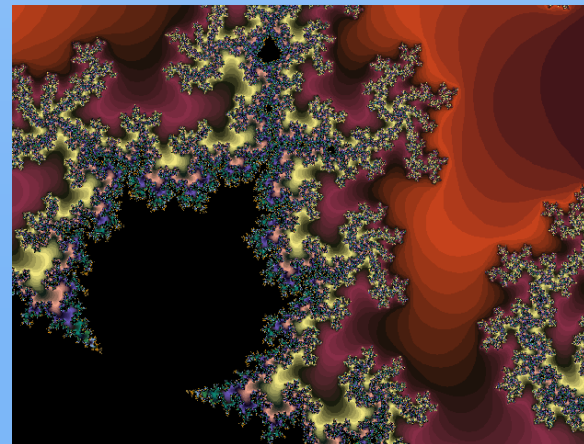
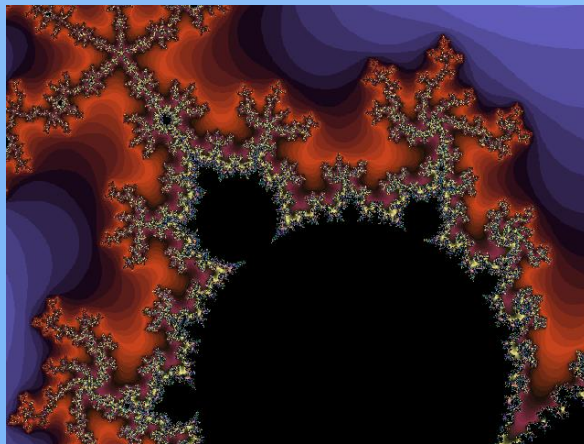
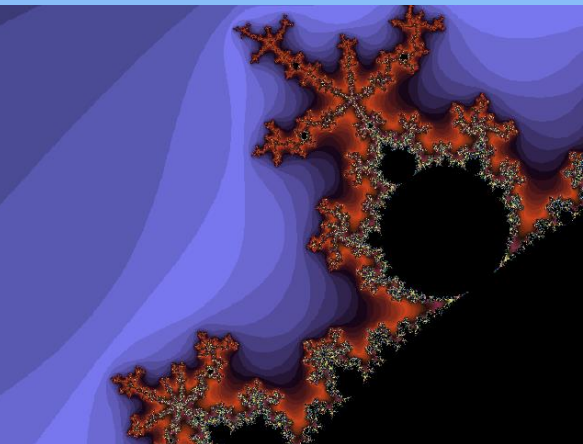
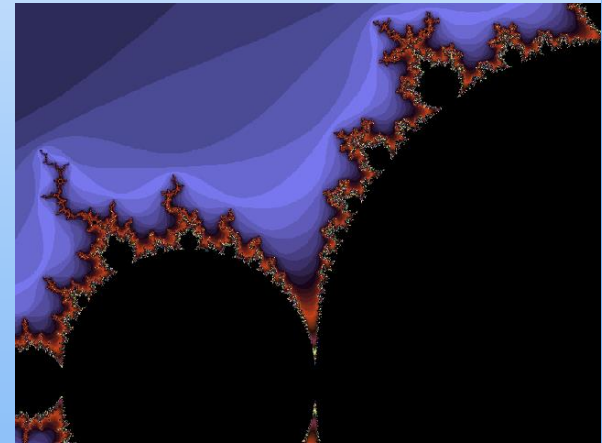
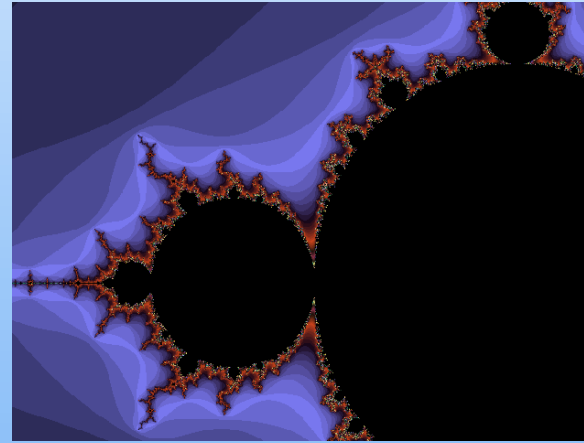
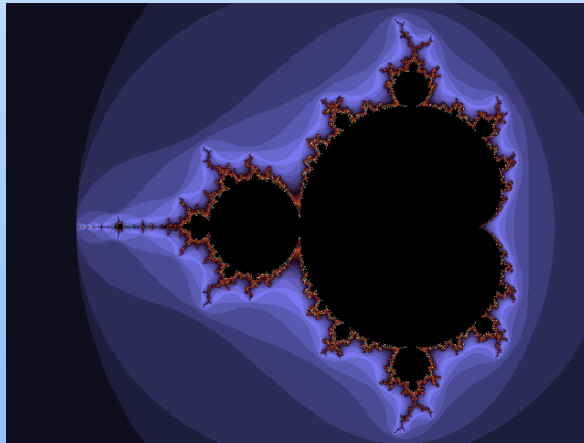
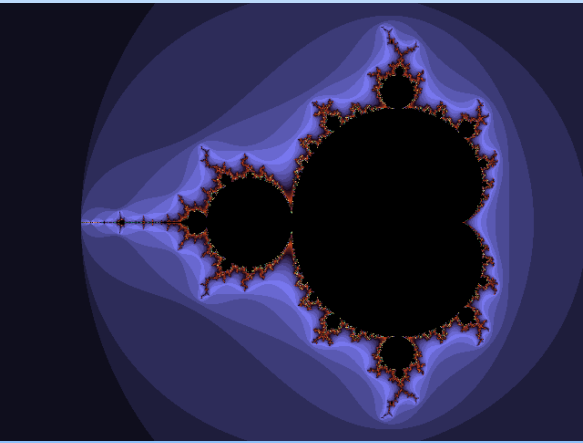
-- Edna St Vincent Millay





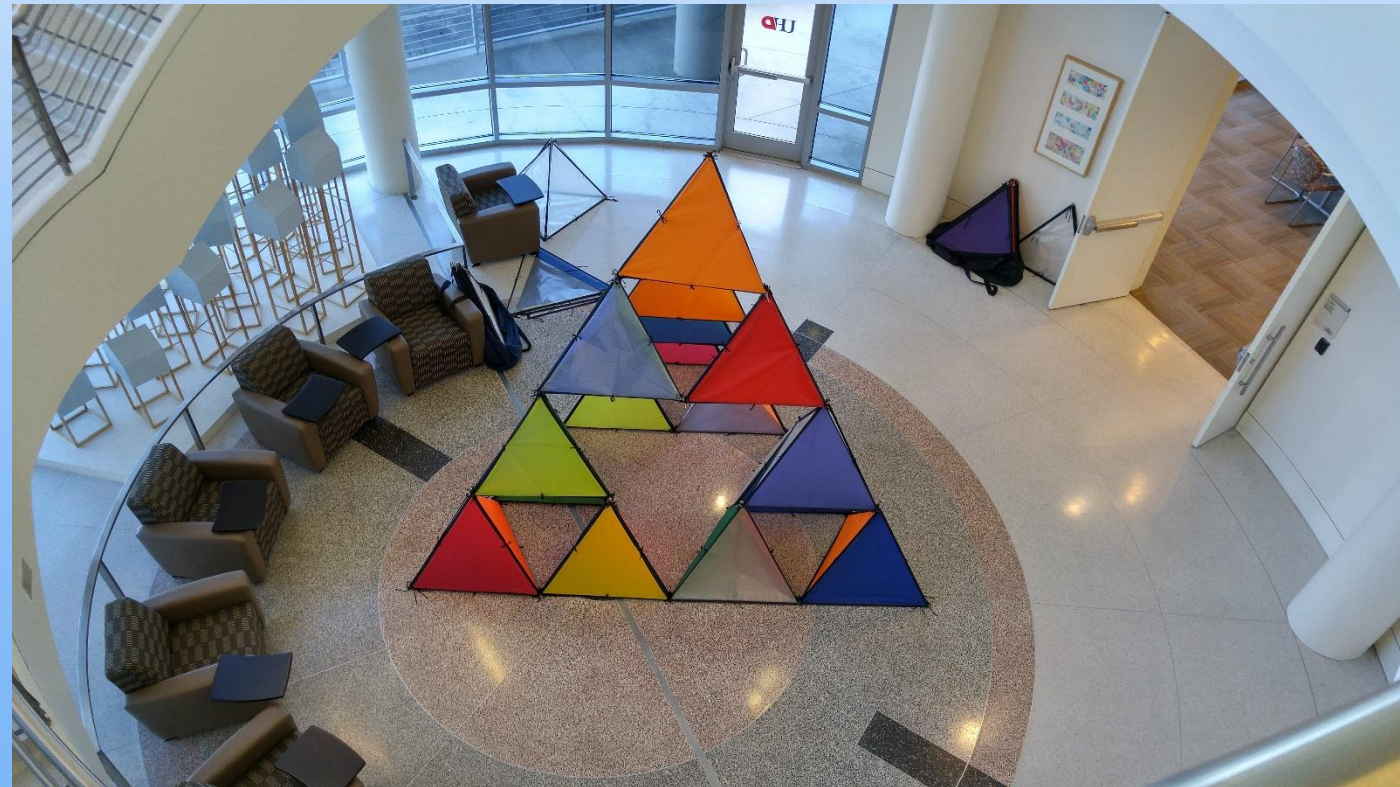
# Family Resemblances...

## Good thinking is good thinking





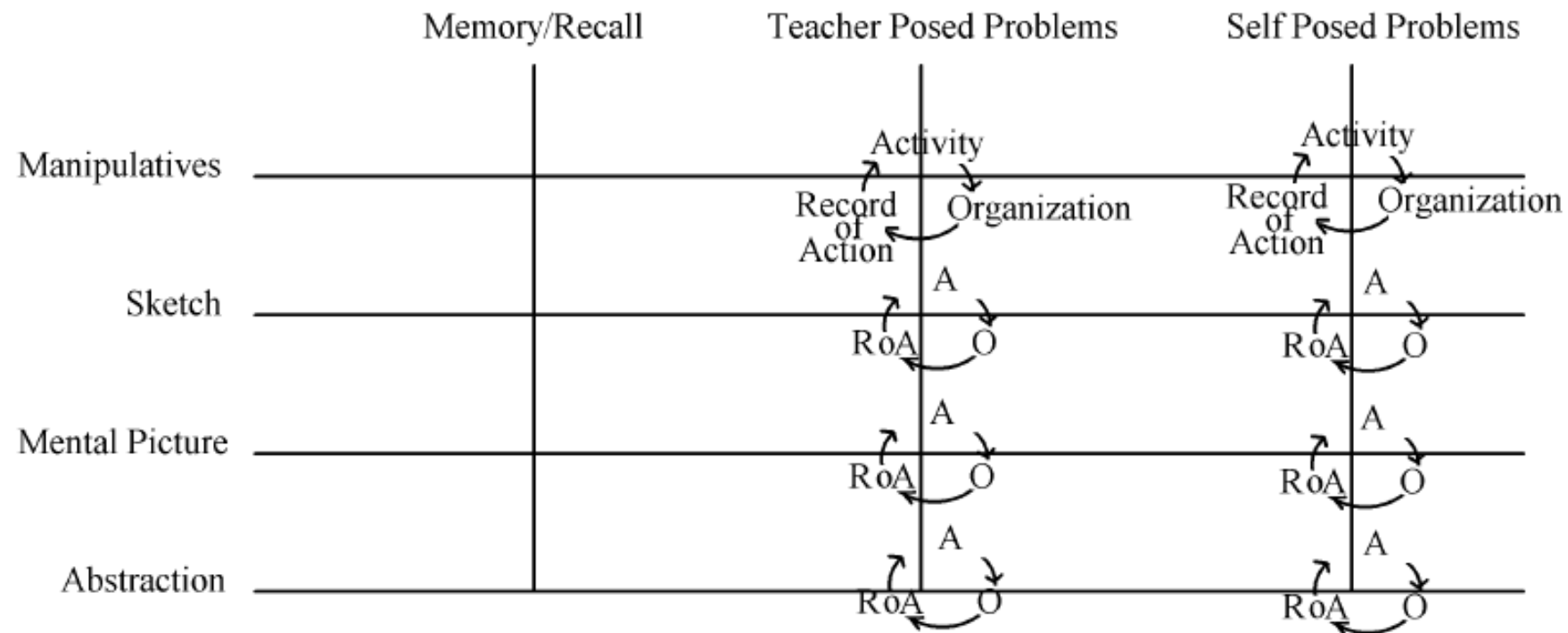
...at every level...





# Action on Objects Teaching Cycle...

## The Actions upon Objects Teaching cycle<sup>1</sup>.



<sup>1</sup> Connell, M. L. (2001). Actions upon objects: A metaphor for technology enhanced mathematics instruction. In D. Tooke & N. Henderson (Eds.). Using information technology in mathematics. (pp. 143-171). Binghamton, NY: Haworth Press.

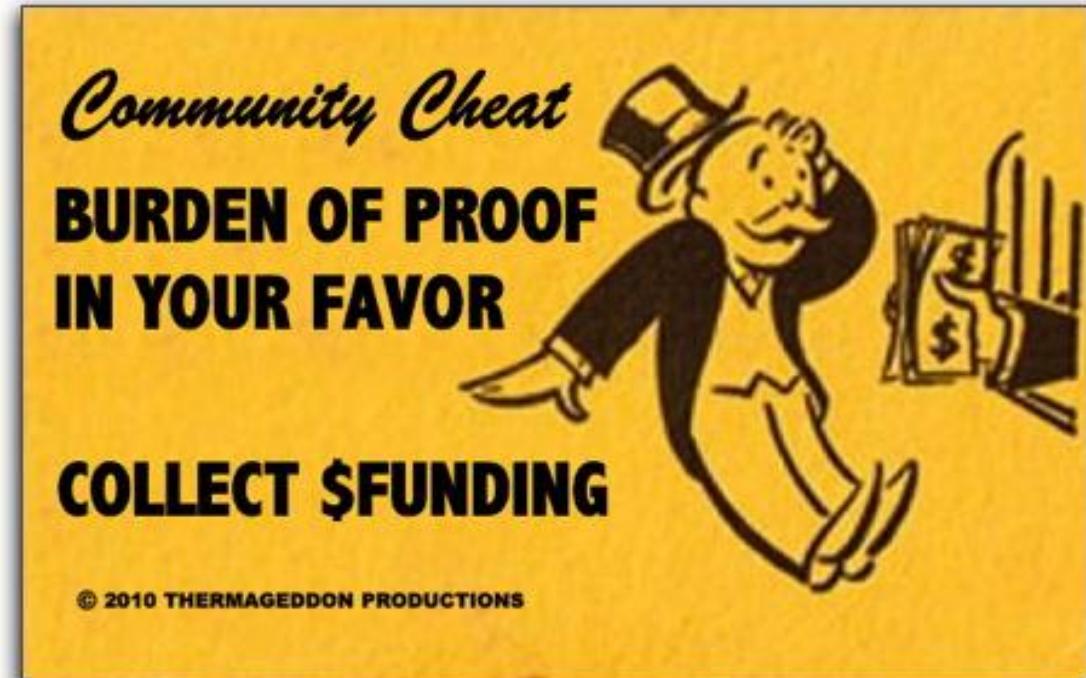
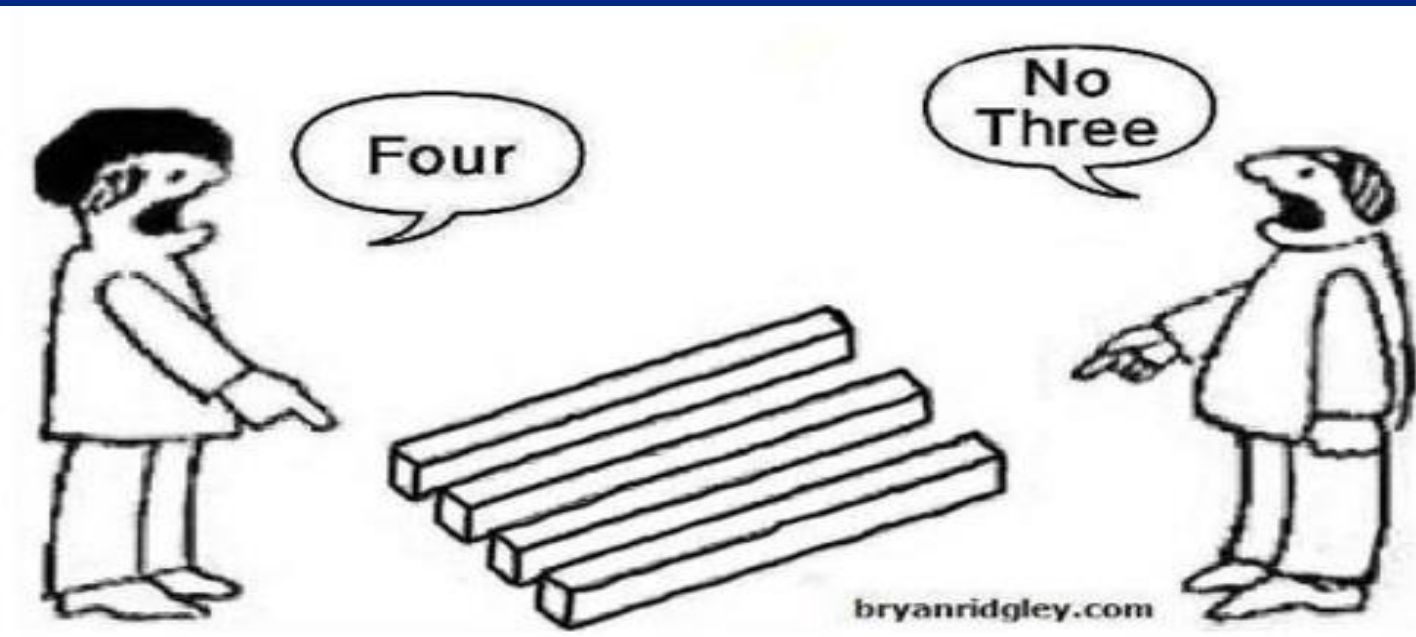
I am always right...  
maybe you are too...

Covers @ FirstCovers.com

**BUT WHY I SHOULD  
CARE !!**



# Do you care enough to argue about it?



# Claims are...

- single statements,
- topics requiring supporting argument,
- NOT questions

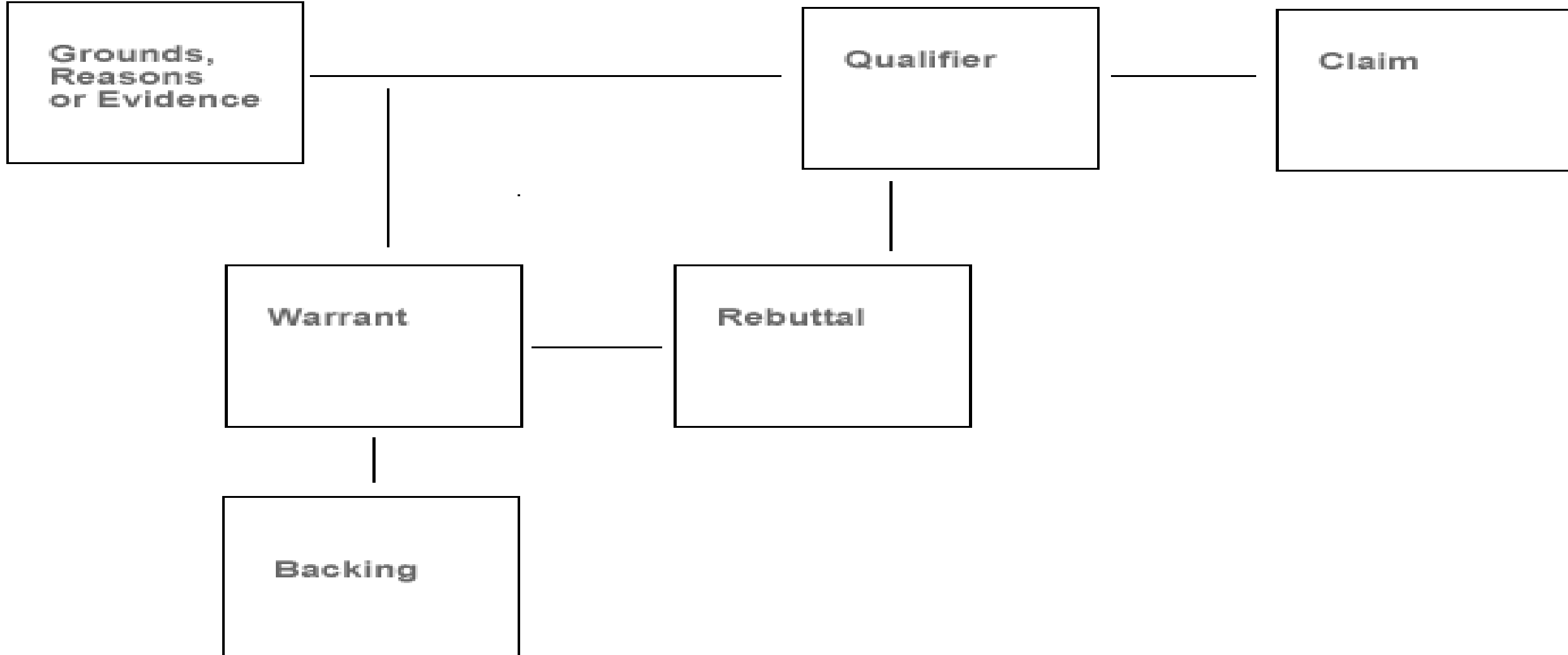


What  
are the  
claims  
here?

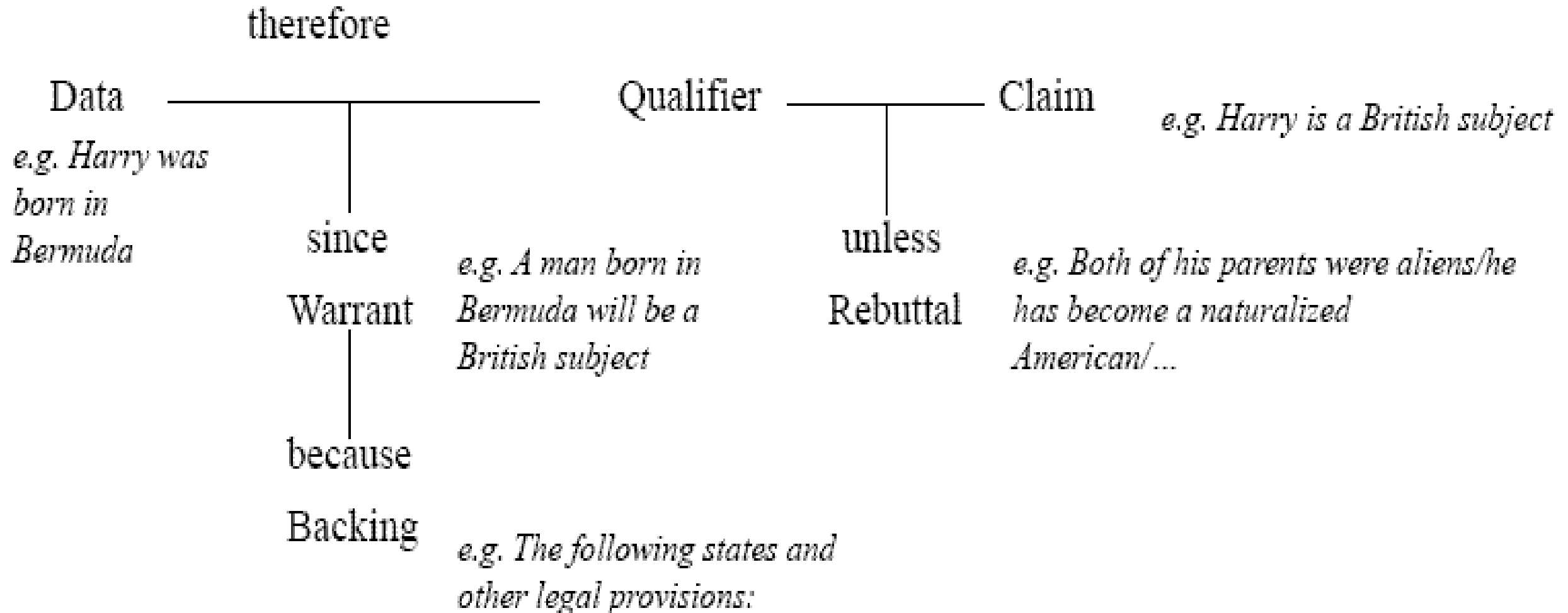




# Grounds for Claims...

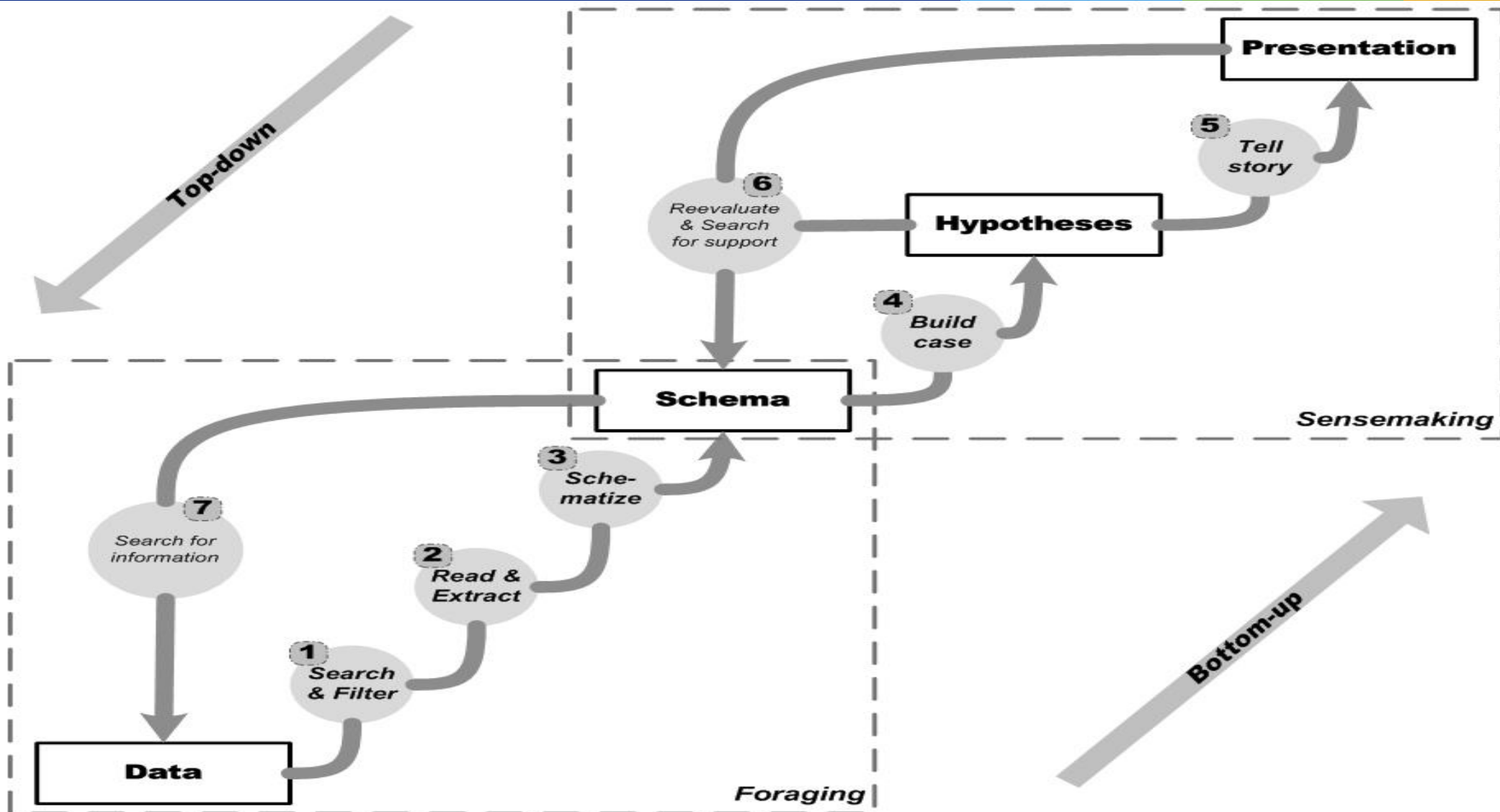


# A sample argument ...



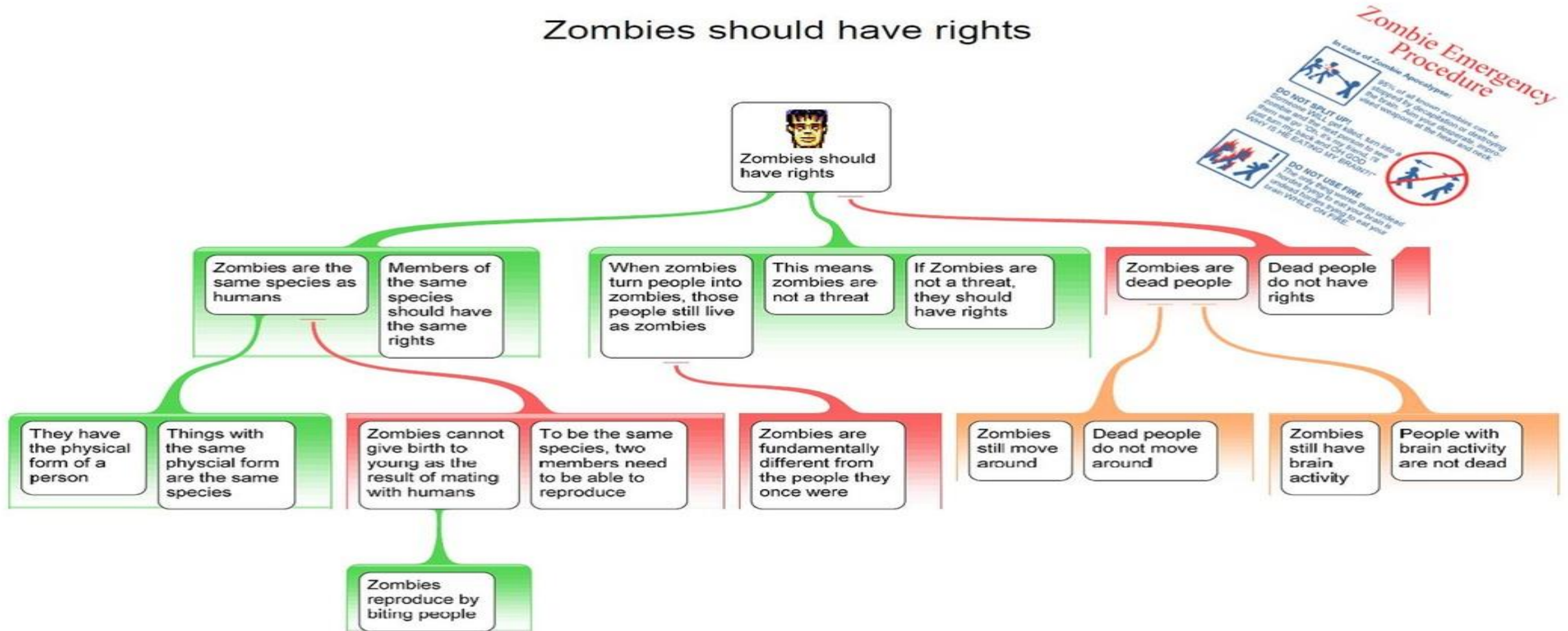


# Steps in generating an argument...



# How did you respond to this argument?

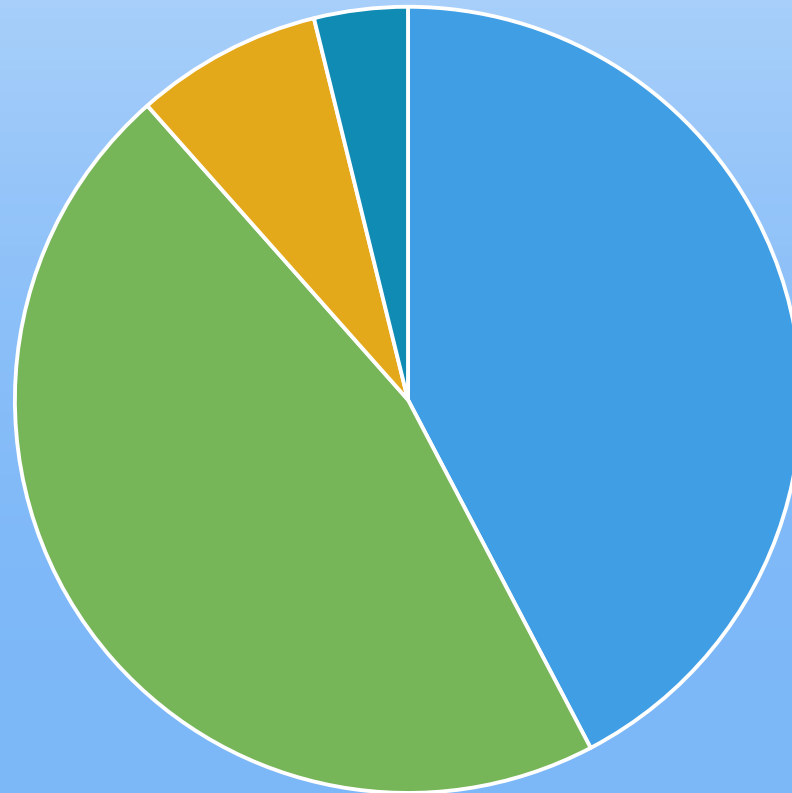
## Zombies should have rights





# The Survey Sez....

Should Zombies have rights??



■ YES ■ NO ■ UNSURE ■ I AM A ZOMBIE

# Warrants

## RIGHTS FOR ZOMBIES!

zombies, to some extent, act like regular people in society. So, if they are acting like regular humans, then why shouldn't they have rights? Zombies are only a little ugly.

if we do give them rights it wouldn't affect us regular humans they will have to go to the same process as us if they do anything bad. They still have some brain activity and can move just like us they might not be as intelligent as us but they still deserve rights.

we should give some rights to a certain extent because if they start acting up or getting out of hand we can stop that from escalating. Just like how a human would get thrown into jail for assaulting someone then we should have some kind of punishment if that get out of hand.

zombies are probably great people. We only know that they wants brains and all based on movies and video games and my question is, what if they're just wanting to talk to us? What if they're just wanting to see their loved ones? I believe that stereotypes discrimination is wrong and truly, I believe that they're just natural. Equality for all individuals am I right? Why shouldn't they have rights?

## NO RIGHTS FOR ZOMBIES!

The zombies are NOT humans, they are simply viruses that are taking the human body as a home. ..Rights should be served when any person, animal, thing or zombie is in their right senses, but zombies do not think with reason, they are not innocent.

zombies should not have rights since they are no longer living and should not live among living humans. They are not intelligent enough and are a threat to society.

if zombies are given rights they would have to be free to roam where they please and that could only mean always looking over your shoulder. It would not be a safe enviroment and zombies serveno purpose but be a threat.

Zombies should not have rights because they bring harm to humans... Although they were once humans they are far from the normal acts of humans because of mental state, diet of human flesh, and the changing of humans to zombies... Changing a human to a zombie is a change from living to dead, which is murder. And people who murder others shouldn't have rights.

# Types of Justifications – Expanded



Commonplace



Authority



Reason



Experience





...and the major question is still...

Which type of justification...



... would convince *my* audience?



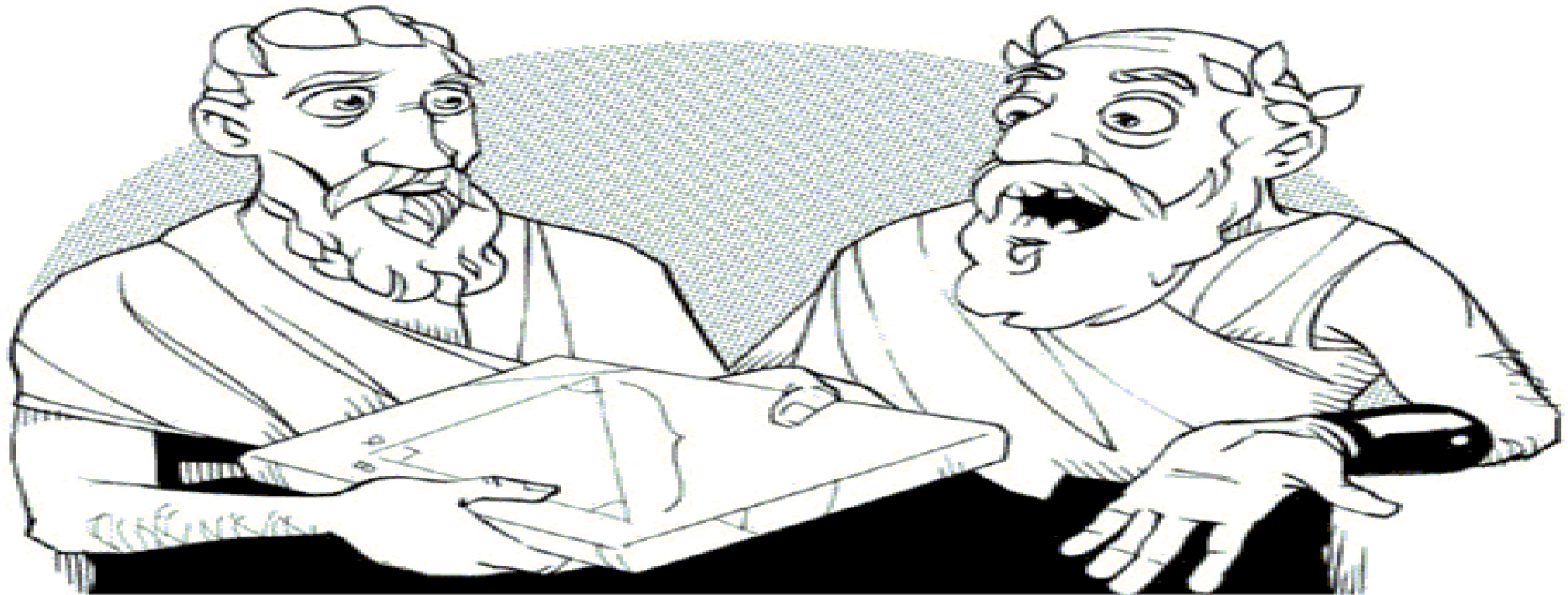
6000 flour in water & white of an egg, and sift white sugar candy on it  
if any Acid of Damar is in glass of they drye, if they thinke.

# Commonplaces

- The notion of a *commonplace* has its origin in the oral histories passed down from pre-historic societies contain literary aspects, characters, or settings that appear again and again in stories from ancient civilizations, religious texts, and even more modern stories.
- A commonplace in argumentation is an aspect of culture, or universally accepted understanding, that can be used as a warrant to a claim.



# Authority



Well, that's one worldview. But right now I'm looking for someone to make the case that  $A^2 + B^2$  *might not* equal  $C^2$ .

I generally trust my dentist, but...



...or at least a  
**laboratory result!**

For a better start in life  
start **COLA** earlier!



**How soon is too soon?**

Not soon enough. Laboratory tests over the last few years have proven that babies who start drinking soda during that early formative period have a much higher chance of gaining acceptance and "fitting in" during those awkward pre-teen and teen years. So, do yourself a favor. Do your child a favor. Start them on a strict regimen of sodas and other sugary carbonated beverages right now, for a lifetime of guaranteed happiness.

**The Soda Pop Board of America**  
1515 W. Hart Ave. - Chicago, ILL.

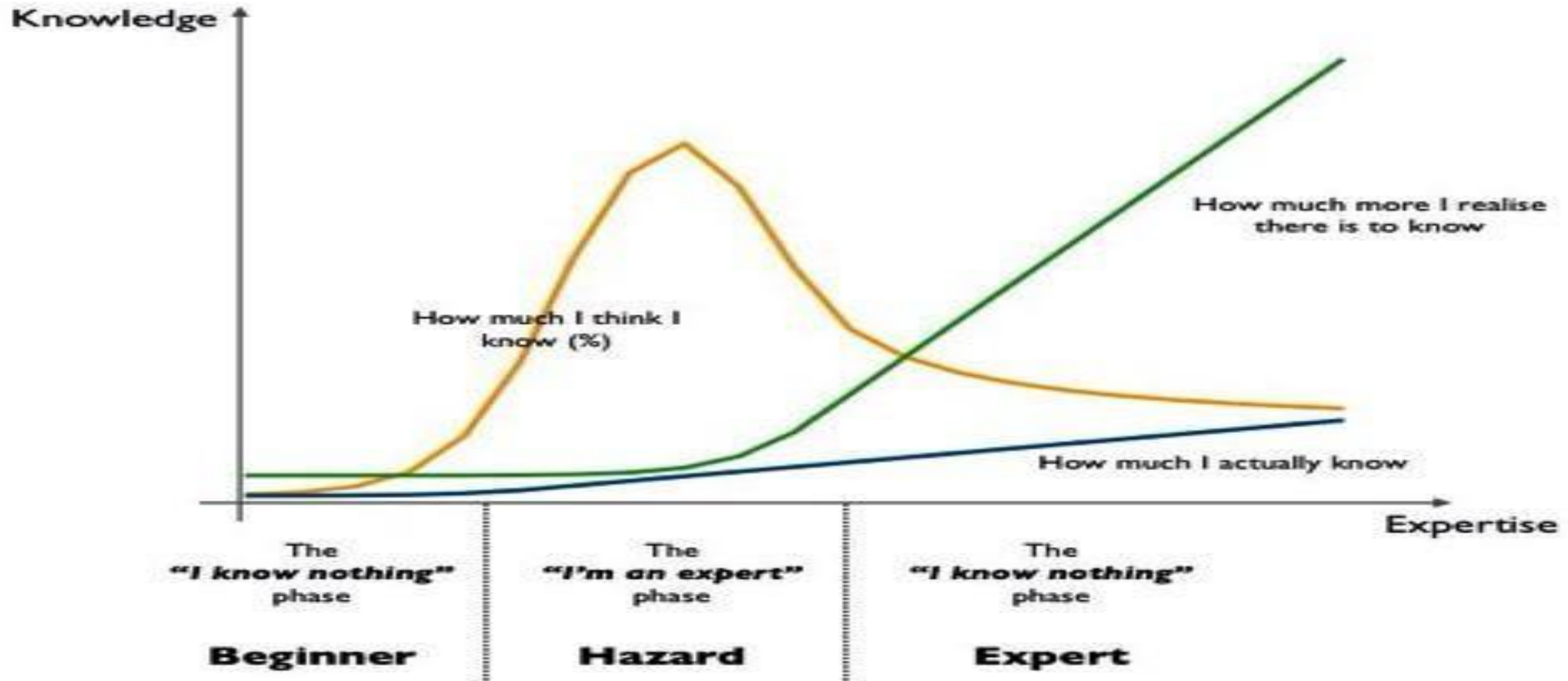
- Promotes Active Lifestyle!
- Boosts Personality!
- Gives body essential sugars!



# Authority

- A logically valid argument from authority grounds a claim in the beliefs of one or more authoritative source(s), whose opinions are likely to be true on the relevant issue. Note: it is *likely* to be true, rather than *necessarily* true.
- As such, an argument from authority can only strongly suggest what is true -- not prove it.
- A logically fallacious argument from authority grounds a claim in the beliefs of a source that is not authoritative.
- (Often, this is called an *appeal* to authority, rather than argument from authority.)

# The Illusion of Authority: The Dunning-Kruger Effect.



Often interpreted as saying...

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*The trouble with the world  
is that the stupid are cocksure  
and the intelligent are full of  
doubt.*

— Bertrand Russell



# Reason



To argue with a person who has renounced the use of reason is like administering medicine to the dead.

*Thomas Paine*

# An example of when REASON fails...

- At five-foot-six and 270 pounds, the bank robber was impossible to miss. On April 19, 1995, he hit two Pittsburgh banks in broad daylight. Security cameras picked up good images of his face — he wore no mask — and showed him holding a gun to the teller. Police made sure the footage was broadcast on the local eleven o'clock news. A tip came in within minutes, and just after midnight, the police were knocking on the suspect's door in McKeesport. Identified as McArthur Wheeler, he was incredulous. “But I wore the juice,” he said.

# An example of when REASON fails...

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- Wheeler told police he rubbed lemon juice on his face to make it invisible to security cameras. Detectives concluded he was not delusional, not on drugs — just incredibly mistaken.

# An example of when REASON fails...

- Wheeler knew that lemon juice is used as an invisible ink. Logically, then, lemon juice would make his face invisible to cameras. He tested this out before the heists, putting juice on his face and snapping a selfie with a Polaroid camera. There was no face in the photo! (Police never figured that out. Most likely Wheeler was no more competent as a photographer than he was as a bank robber.) Wheeler reported one problem with his scheme: The lemon juice stung his eyes so badly that he could barely see.



# An example of when REASON fails...

- Wheeler went to jail and into the annals of the world's dumbest criminals. It was such a feature, in the 1996 World Almanac, that brought Wheeler's story to the attention of David Dunning, who saw in this tale that those most lacking in knowledge and skills are least able to appreciate that lack. This observation would eventually become known as the **Dunning-Kruger** effect we mentioned earlier.

# Reason – Part One

- Reasons are statements that support a given claim, making a claim more than a mere assertion. Reasons are statements in an argument that pass two tests. First, reasons are answers to the hypothetical challenge: “Why do you say that?” or “What justifications can you give me to believe that?” If a claim about liberal arts education is challenged, a reasoned response could be: “It teaches students to think independently.” Reasons can be linked—most often, not explicitly—to claims with the word “because.”

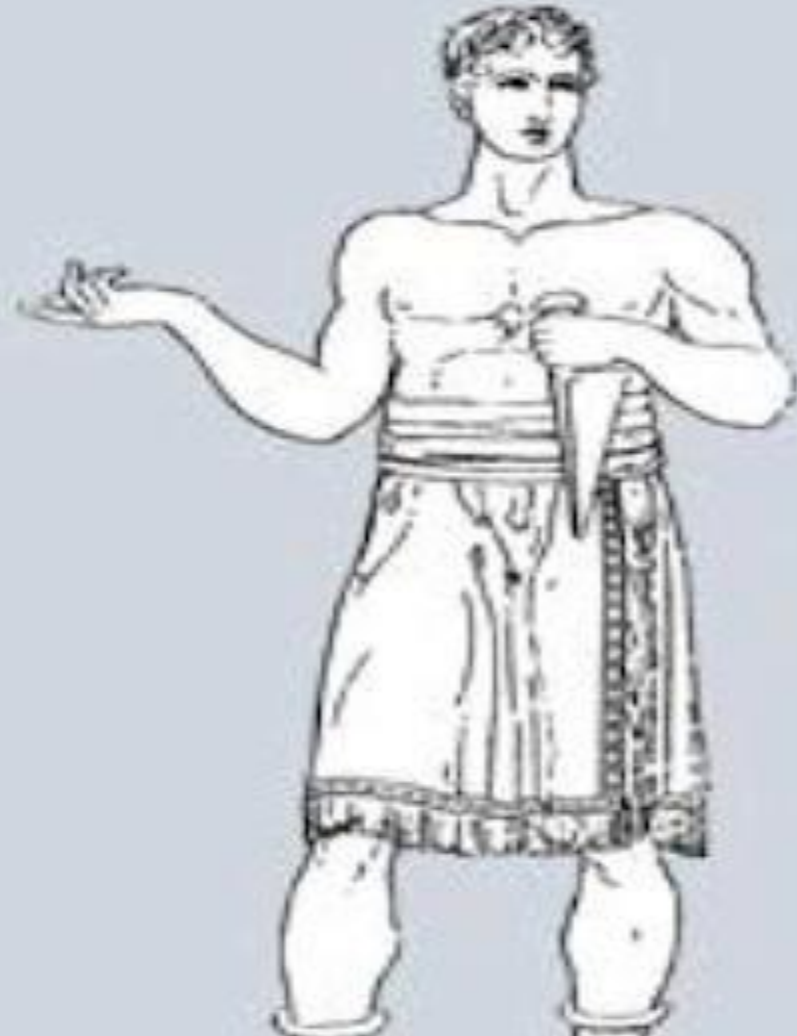
# Reason – Part Two

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- In and of themselves, reasons are generally never enough to win an argument. You need to show your readers specific evidence supporting your reasons.
- The details you provide are what will make your reasons relevant.
- Try to include concrete evidence you will include to illustrate and explain your reasoning such as facts, statistics, stories, etc.

# Experience

Of course I talk to  
myself. Sometimes  
I need expert advice.

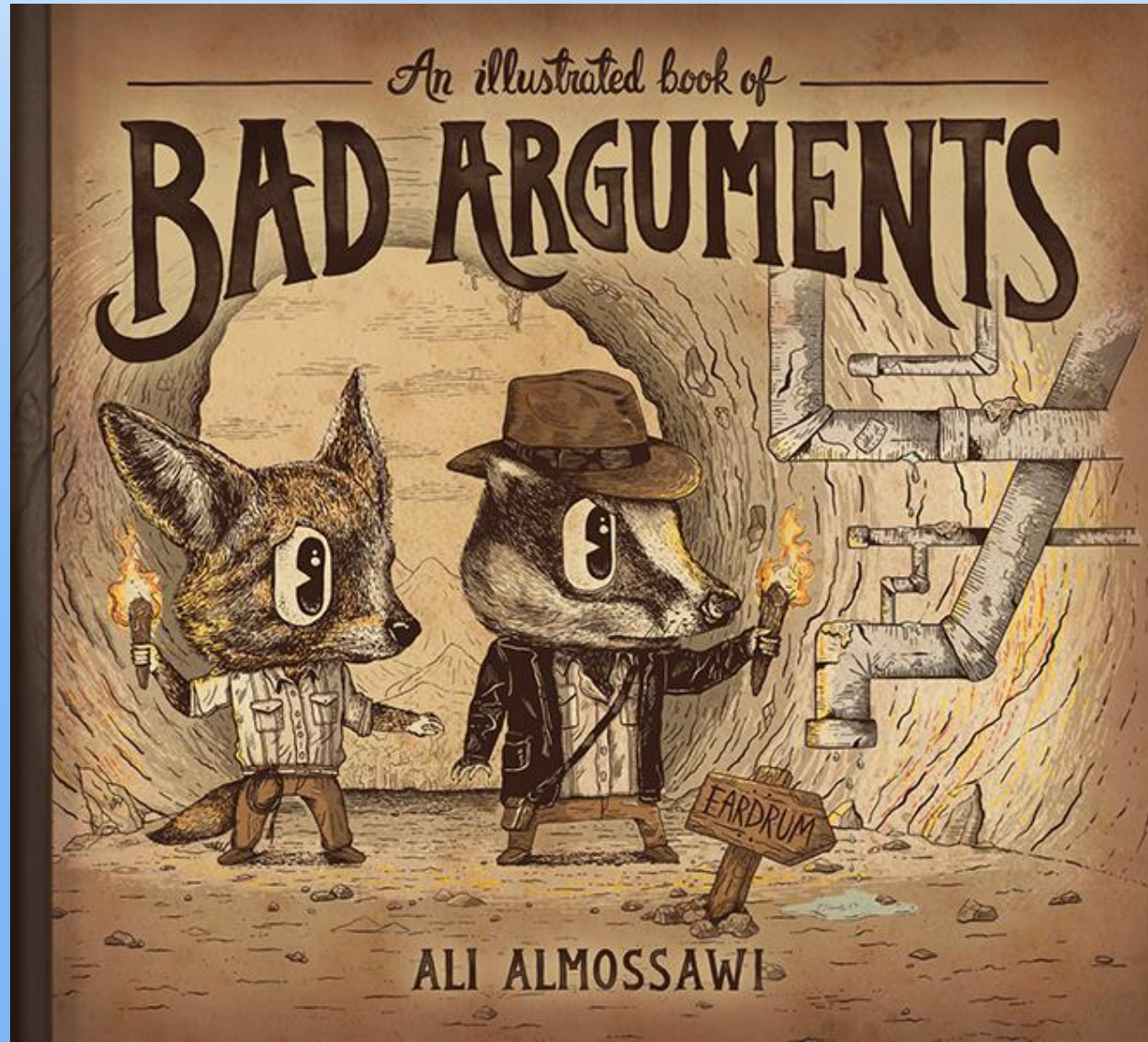




# Experience

- ▣ Personal truths which arise from personal experience are weaker than empirical truths, for no matter how many people claim to have the same personal truths, if it's not verifiable, it lacks the ability to be tested or repeated.
- ▣ Since the brain interprets all we see, feel and react to, if the brain is thinking in a certain way during an experience, the way we perceive the experience may be altered. However, the happenings which led to the experience remain unaltered. No matter how real an experience might seem to you, if it never happened, it remains never having happened.

# Argument errors selected from...



# Ranking of the WORST offenders...

## Worst Offenders.



# Ranking of the WORST offenders...

## Worst Offenders.





# What makes these so bad?



# Authority



# Fear





# Ignorance





# Equivocation



"Quit stalling, Smithers. Where's the *SALES* chart?"

# Ad Hominem



# Hypocrisy



# Consequences





# False Dilemma



# No True Scotsman



# Association



# Band Wagon





# Straw Man



# Why COMMENSENSE and experience fails ...



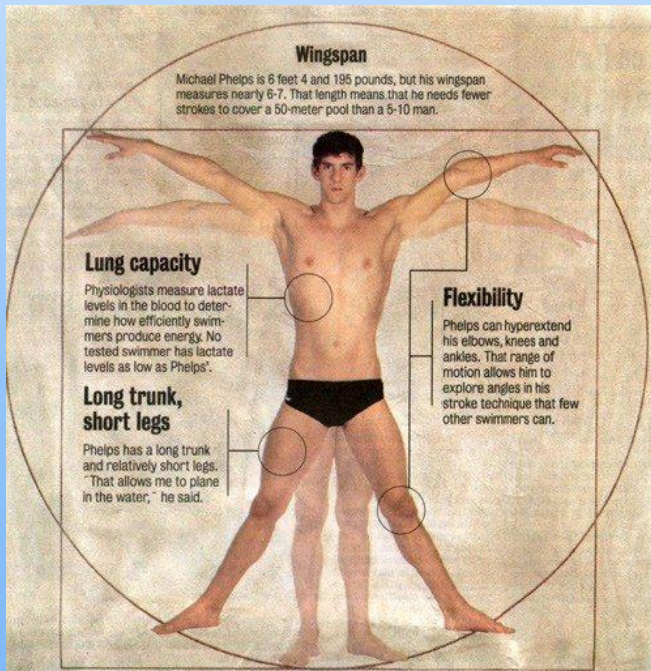
# We agree with people who think like us...

- If we agree with someone's beliefs, we're more likely to be friends with them. While this makes sense, it means that we subconsciously begin to ignore or dismiss anything that threatens our world views, since we surround ourselves with people and information that confirm what we already think.





# We confuse selection factors with effects...

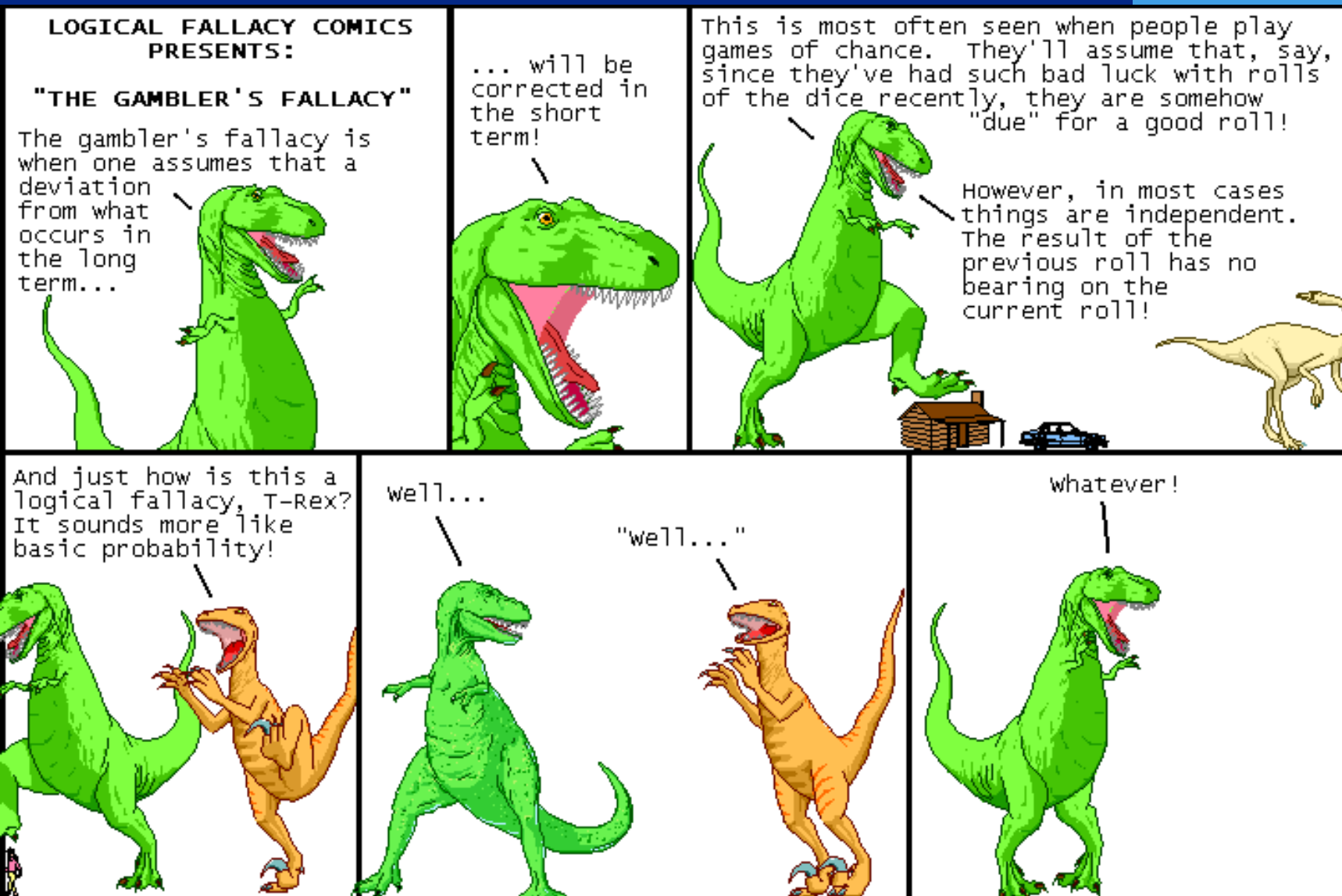


*Professional swimmers don't have perfect bodies because they train extensively. Rather, they are good swimmers because of their physiques. How their bodies are designed is a factor for selection and not the result of their activities.*

- The “swimmer’s body illusion” occurs **when we confuse selection factors with results.** Another good example is top performing universities: are they actually the best schools, or do they choose the best students, who do well regardless of the school’s influence?



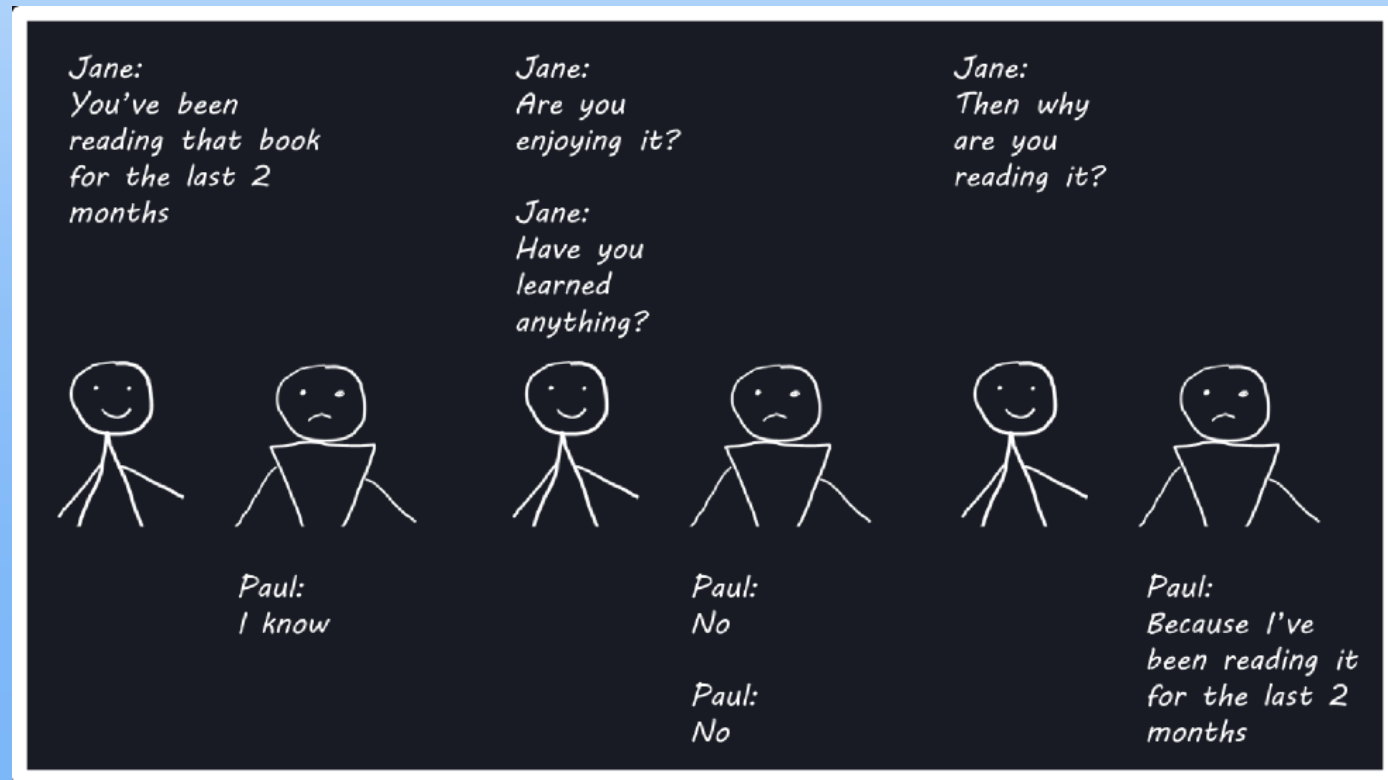
# We are bad at predicting the odds...



- ... and yes, we ARE bad at applying basic probability as well...

# We worry about what is already lost...

- The term **sunk cost** refers to any cost (not just monetary, but also time and effort) that has been paid already and cannot be recovered.
- So, a payment of time or money that's gone forever, basically.
- The sunk cost fallacy plays on a human tendency to emphasize loss over gain.



# We make bad comparison choices...

## Anchoring

How we choose  
by comparing  
with a nearby  
reference point



- The anchoring effect: we tend to focus on a particular value and compare it to our other options, seeing the difference between values rather than the value of each option itself.

# We rationalize what we have already done...

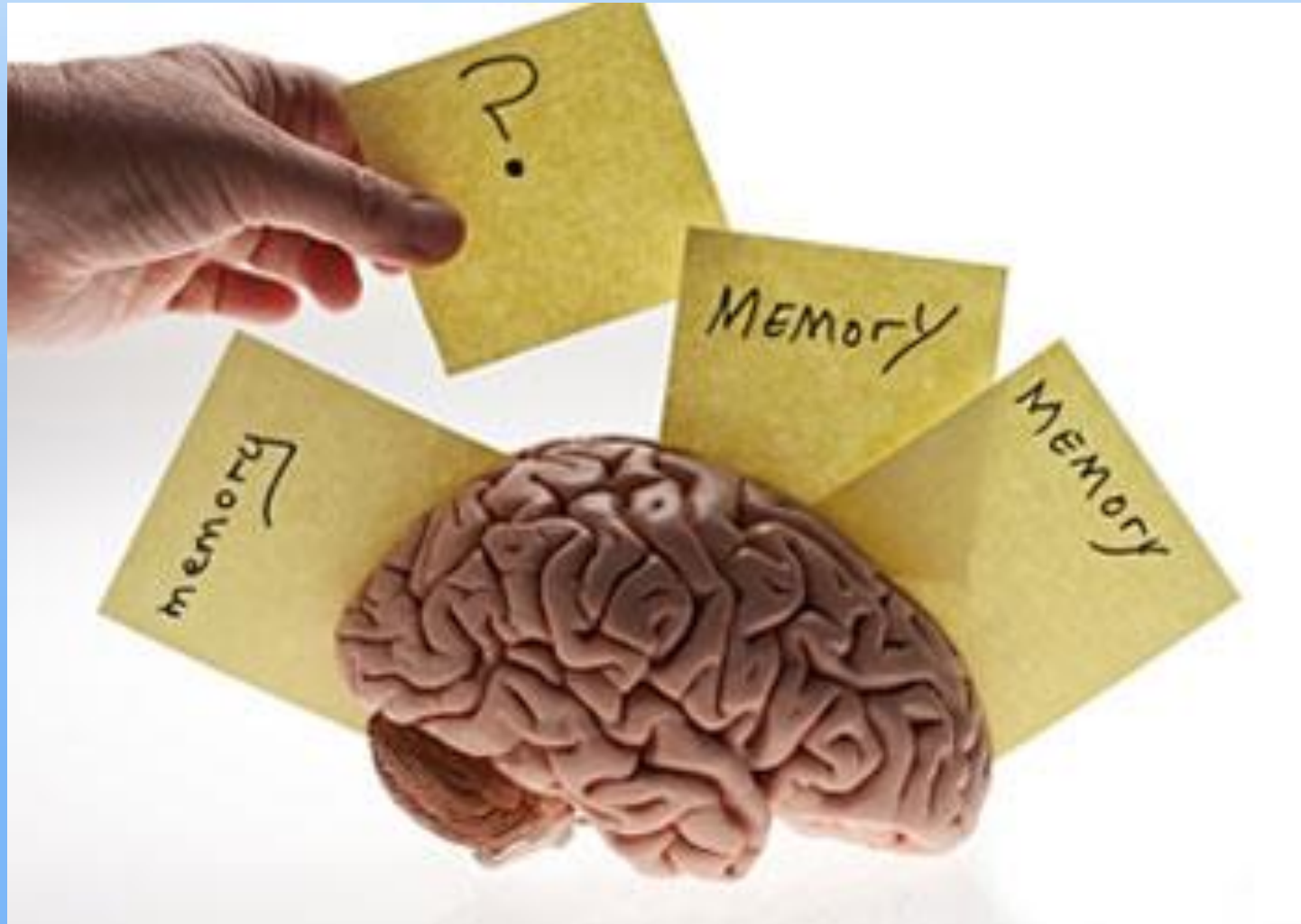
- How many times have you returned from a shopping trip only to be less than satisfied with your purchase decisions and started rationalizing them to yourself?
- We are good at convincing badly thought-out purchases are necessary after all. This is known as **post-purchase rationalization** or **Buyer's Stockholm Syndrome**.





# We believe memories more than facts...

- My memory is getting better every year.
- I used to be able to remember everything that ever happened to me.
- Now, I can remember it whether it happened or not.



# We rely on stereotypes more than we realize...



- The human mind is so wedded to stereotypes and so distracted by vivid descriptions that it will seize upon them, even when they defy logic, rather than upon truly relevant facts.

# Carl Sagan's Baloney Detection Kit!

## Basic Steps to Skepticism

### *Carl Sagan's Baloney Detection Kit*

**Wherever possible there must be independent confirmation of the facts**

**Encourage substantive debate on the evidence**

**Arguments from authority carry little weight**

**Spin more than one hypothesis**

**Try not to get overly attached to a hypothesis**

**If there are two hypothesis that explain the data equally choose the simpler.**

**Ask whether the hypothesis can be falsified**



# So, what do we do?

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- The lesson here? Whenever possible, look at the facts. Examine the data. Don't base a factual decision on your gut instinct without *at least* exploring the data objectively first.



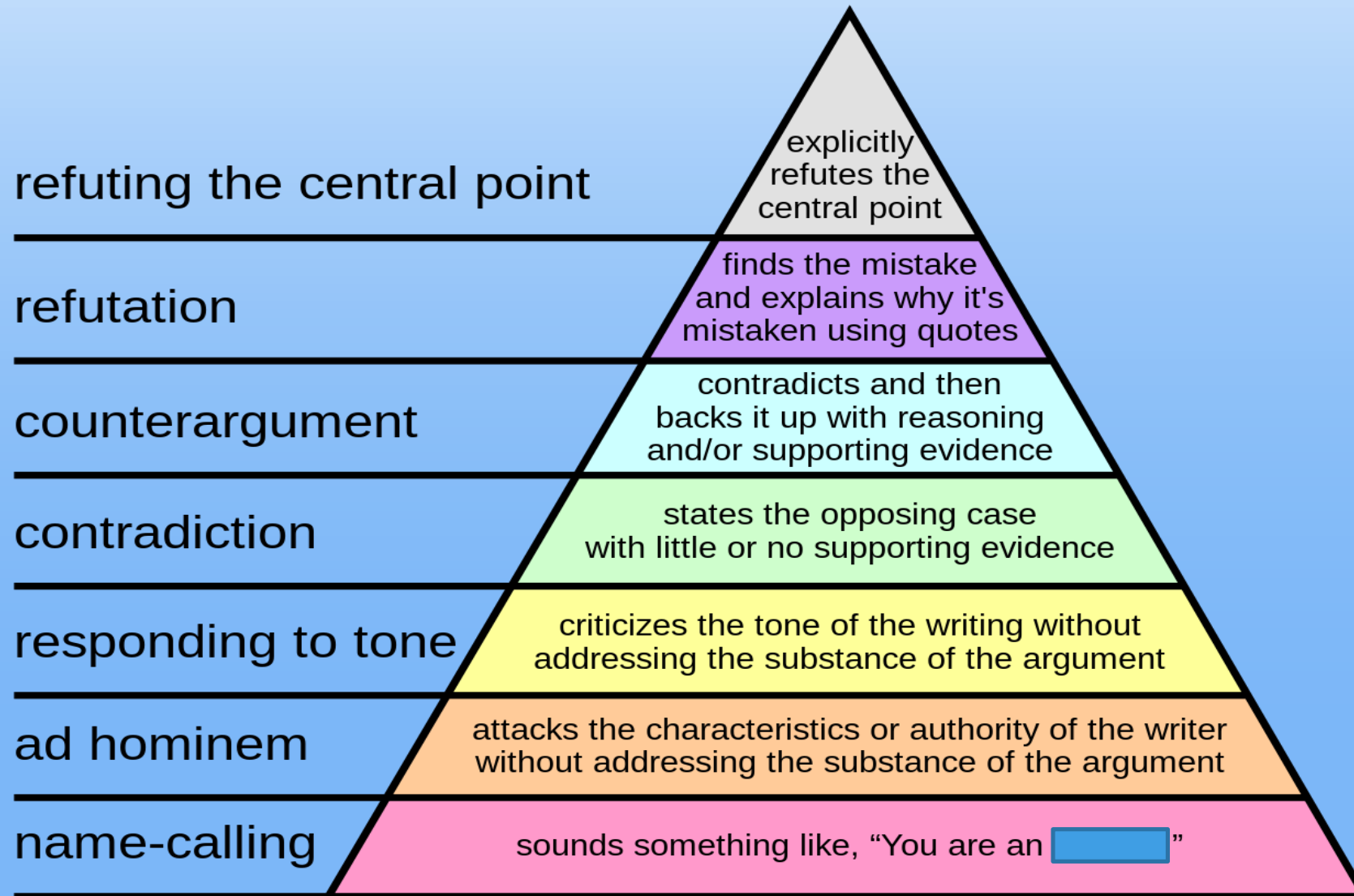
# A student posed problem: Internet arguments

Cancel all my meetings.

Someone on the internet  
is wrong.



# Graham's Hierarchy of Internet Argumentation



# Small Group Discussions.

During your group discussions remember...

Don't raise your voice,  
improve your  
argument.

-Desmond Tutu



# Try out your reasoning for Argument One in your small groups.

- Identify a community need that you care enough about to have an “argument” over.
- Give an example of what type of evidence would convince someone else to care as well from the perspective of:
  - Commonplace
  - Authority
  - Reasoning
  - Experience



A final argument...

Am I  
Batman?

One “authority” stated...

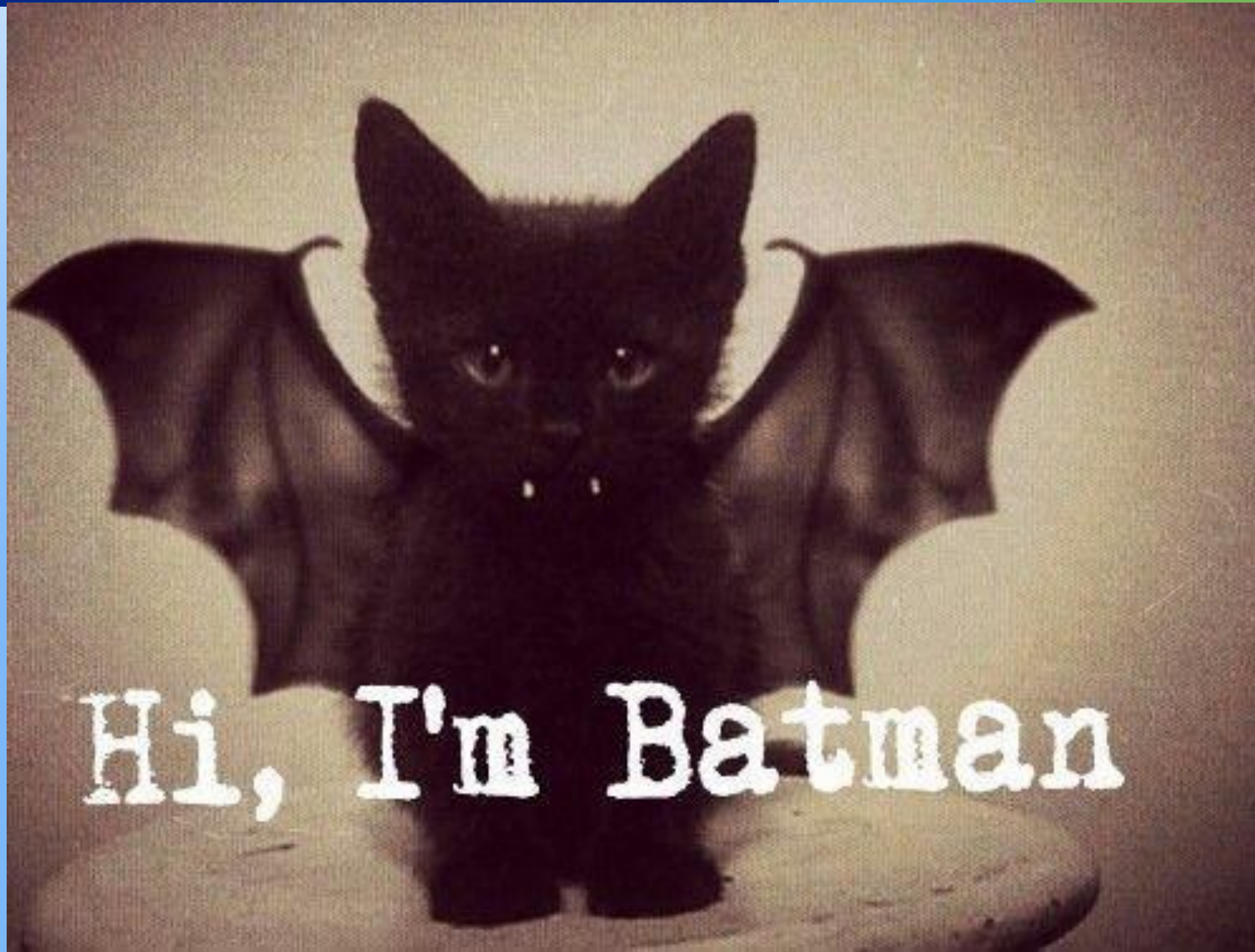


...this claim, however, was quickly countered...



I AM BATMAN  
Your Argument is Invalid.

..which raised even more claims...





...which were in turn countered...



... countered...

**I AM THE NIGHT I AM BATMAN**



**NO YOUR NOT BATMAN YOUR  
JUST A BAT, NO I'M BATMAN**

...and countered again!





Arguments were put forward...





...supporting one warrant or another...



BATMAN

I am vengeance!  
I am the night!  
I AM BATMAN!

... based on a wide variety of evidence...



...some were more intriguing than others...



## THE MULTIVERSE THEORY

Somewhere, within the quantum foam of existence, amongst the very building blocks of reality, there is a universe where you... are Batman.

...while others were clearly delusional...

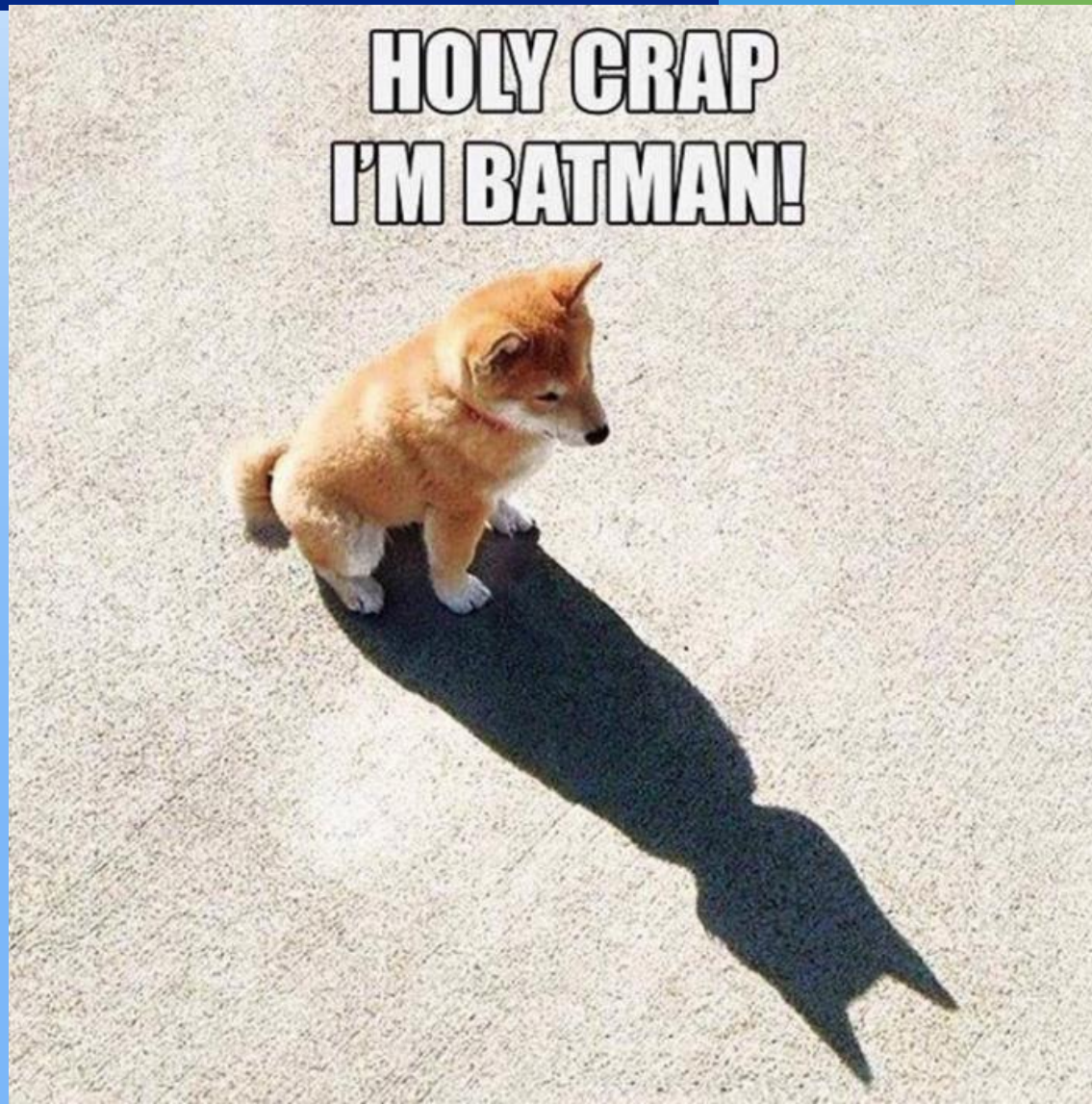




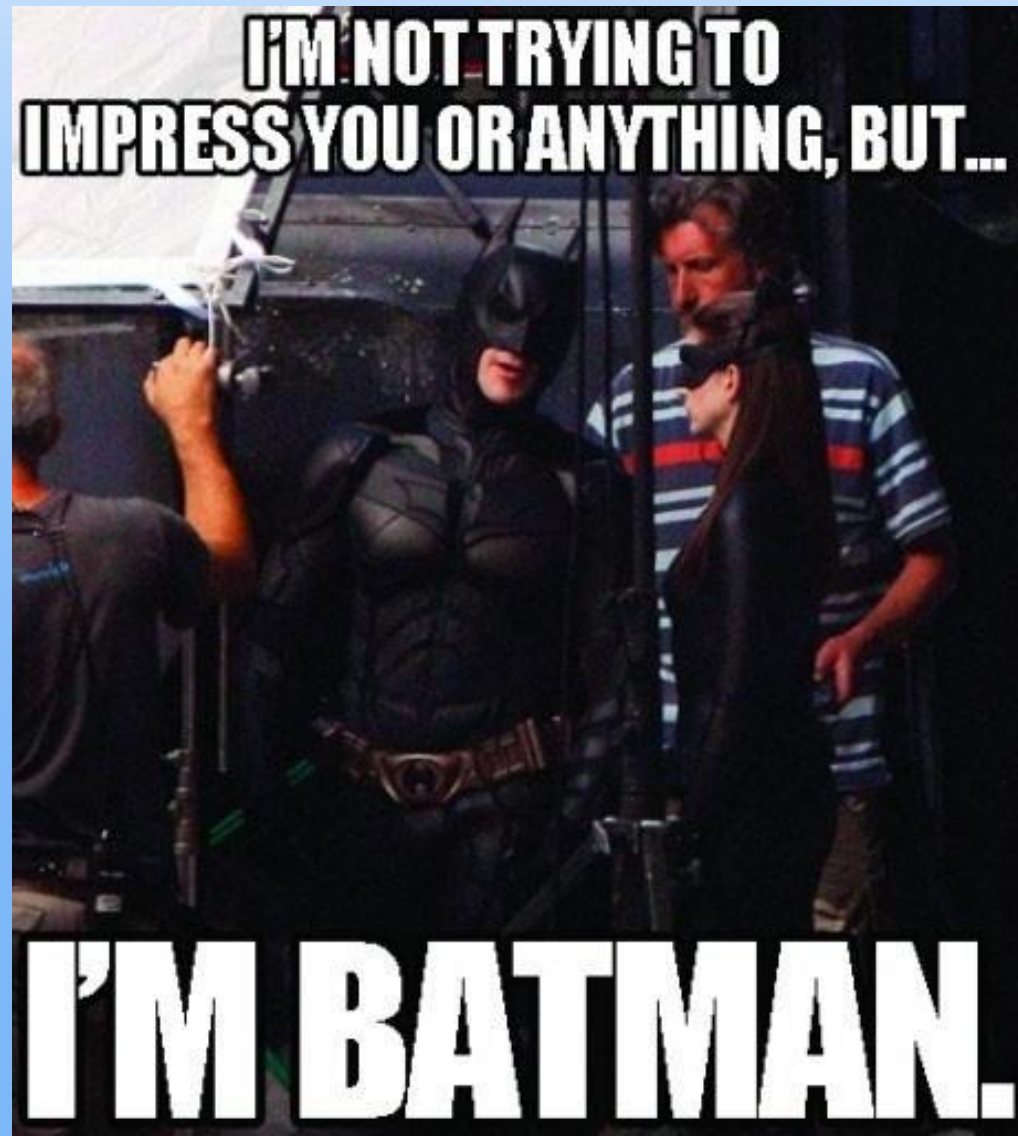
... simple wish fulfillment ...



... hypothetical ...



... non-factual ...





... or not intended seriously.



LOL  
I AM A BATMAN



Unfortunately, many did not understand the argument at all...



# Which lead to ungrounded conclusions...



**BATMAN IS RIDING  
SUPERMAN**

This renders your argument invalid.

Sometimes these conclusions resulted in planned action...

**I'm gonna hang  
a Batman outfit  
in my closet  
just to screw  
with myself  
when I get  
Alzheimer's.**

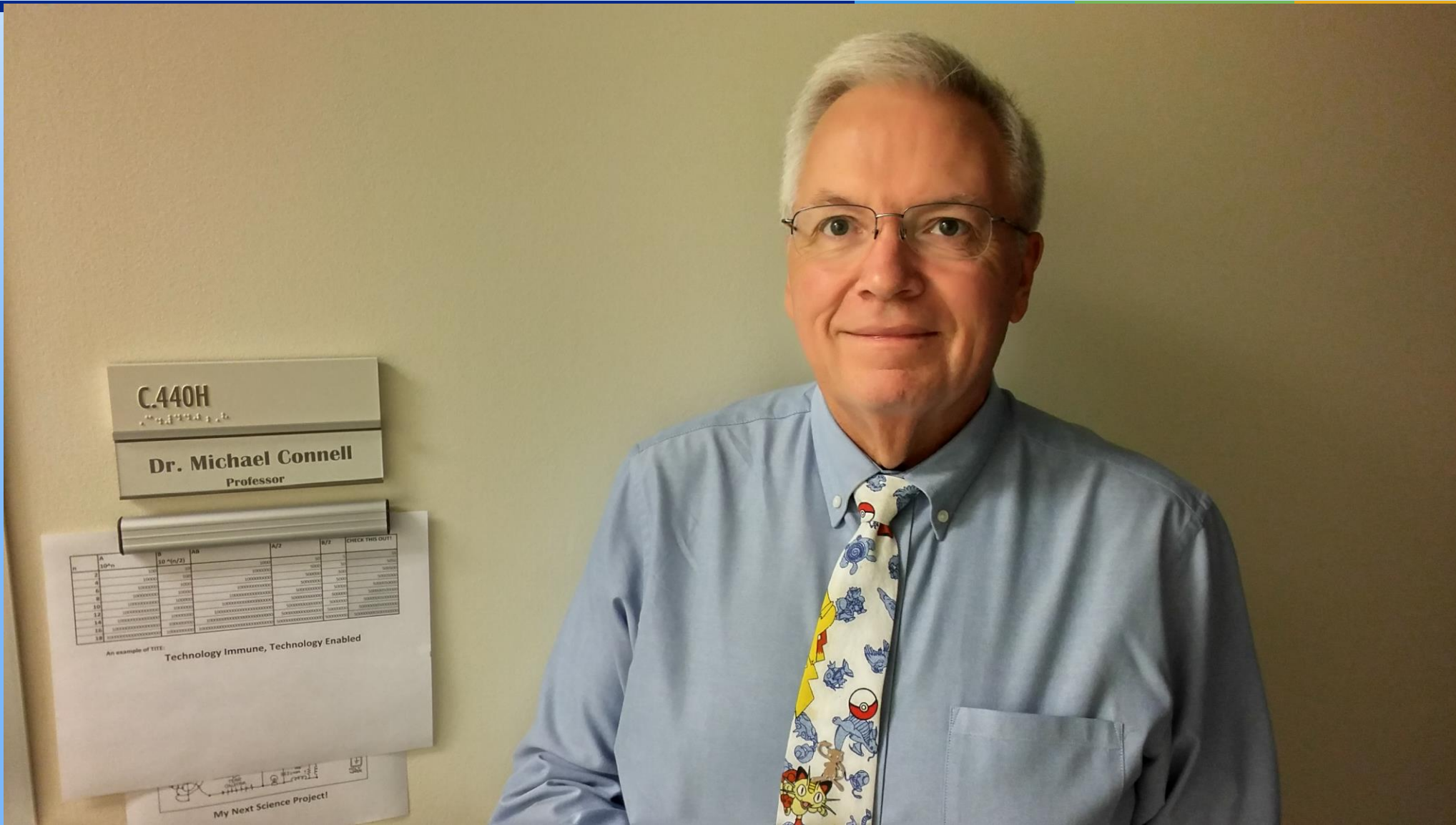
Today's argument, however, is simple...

Am I

Batman?



... or, am I not...



Am I Batman? The argument is simple:

I'm not saying I am batman,  
I am just saying no one has  
ever seen me and batman  
in the same room together.

# What do you think? And **WHY!**

---

- Remember, even I will “lie” for educational purposes.
- As such, an argument from authority can only strongly suggest what is true -- not prove it.
- Prepare a response to this identity crisis making direct reference to each of the CARE components of argument developed in class to date.



... SOOOO ...

**DO YOUR HOMEWORK!**

