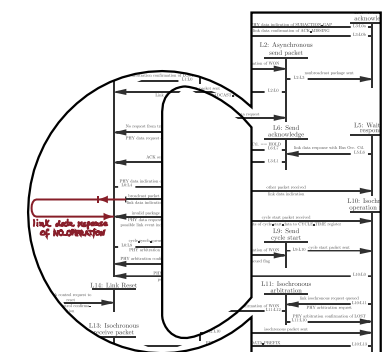




# Ethics for Nerds

An Advanced Course in Computer Science  
Summer Semester 2020

Precise Thinking 7  
Fallacies and Pseudo-Reasoning

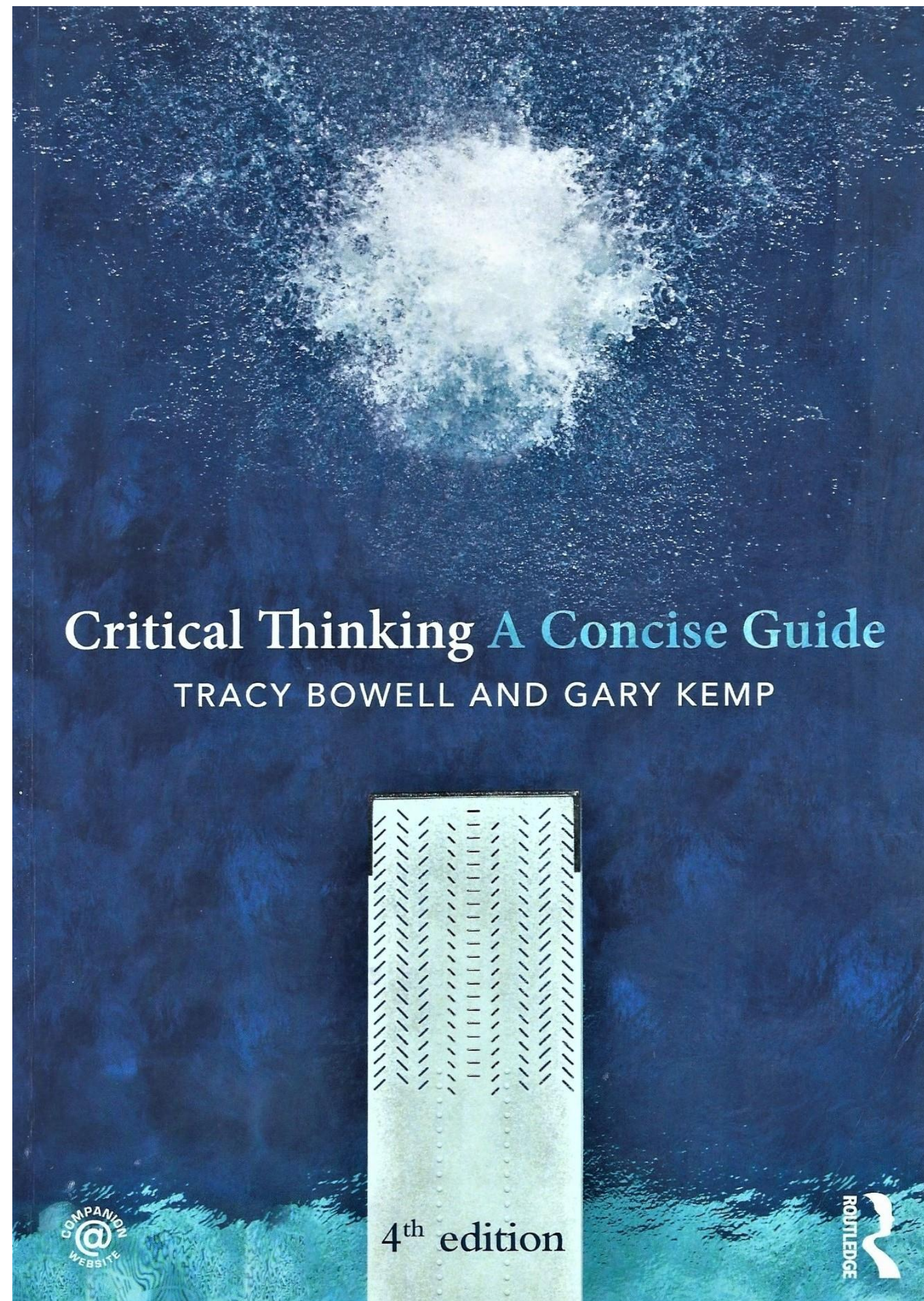


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DES  
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We *very* loosely follow this book:

Bowell, T., & Kemp, G. (2015). *Critical thinking: A concise guide (4<sup>th</sup> ed.)*. Routledge.

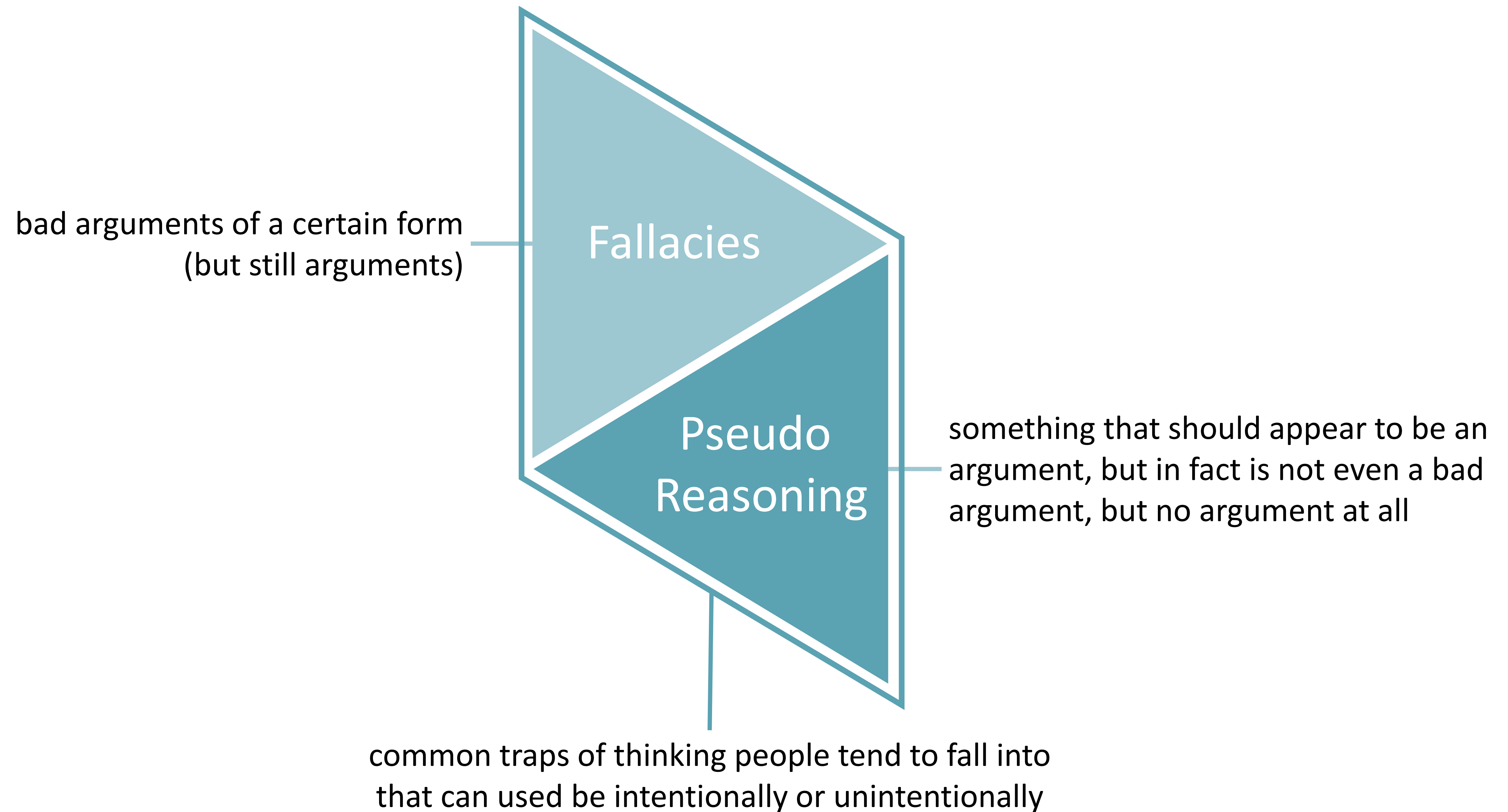
However, *lots* of things deviate from the book. What is said in the lecture has precedence over the book.

You do **not** have to buy the book. If you want to have an inexpensive look, you can find a digital copy of the 2<sup>nd</sup> edition online at:

[http://www.academia.edu/download/46383480/ Tracy Bowell Critical Thinking A Concise Guide BookFi.org.pdf](http://www.academia.edu/download/46383480/Tracy_Bowell_Critical_Thinking_A_Concise_Guide_BookFi.org.pdf)



# FALLACIES AND PSEUDO-REASONING



**When reconstructing an argument, try to reconstruct it as...**

a good argument that is neither a fallacy nor pseudo reasoning

usually better than

a fallacy

usually better than

pseudo-reasoning

fallacies and pseudo reasoning can concern...

validity of  
arguments

how  
informative  
an argument  
is

rules of  
proper  
discourse

truth of  
premises

...

**Affirming the consequent**

a Modus Ponens the wrong way around

P1:  $a \rightarrow b$

P2:  $b$

---

C:  $a$

If Timo flicked the switch, then the building will explode. The building exploded, so Timo must have flicked the switch.

**Denying the antecedent**

a Modus Tollens the wrong way around

P1:  $a \rightarrow b$

P2:  $\neg a$

---

C:  $\neg b$

If Timo flicks the switch, then the building will explode. Timo does not flick the switch, so the building does not explode.

Composition

just because some things are true individually, it does not mean that you can combine them in any context

- P1: It is a good idea to add chocolate to a plain cookie dough.
- P2: It is a good idea to add cinnamon to a plain cookie dough.
- P3: It is a good idea to add blueberries to a plain cookie dough.
- P4: It is a good idea to add marzipan to a plain cookie dough.
- P5: It is a good idea to add walnuts to a plain cookie dough.
- P6: It is a good idea to add hazelnuts to a plain cookie dough.
- P7: It is a good idea to add coconut to a plain cookie dough.
- P8: It is a good idea to add rum to a plain cookie dough.
- P9: It is a good idea to add vanilla to a plain cookie dough.

C: It is a good idea to add chocolate, cinnamon, blueberries, marzipan, walnuts, hazelnuts, coconut, rum, and vanilla to a plain cookie dough.

P1:	a	<div>≠</div>	P1:	a
P2:	b		P2:	b
P3:	c		P3:	c
P4:	d		P4:	d
P5:	e		P5:	e
P6:	f		P6:	f
P7:	g		P7:	g
P8:	h		P8:	h
P9:	i		P9:	i
<hr/>			<hr/>	
C:	j		C:	$a \wedge b \wedge c \wedge d \wedge e \wedge f \wedge g \wedge h \wedge i$

## Equivocation

an argument is not sound because one expression is used in two or more different ways

P1: Only men can speak rationally.

P2: Women are not men.

---

C: Therefore, women cannot speak rationally.

The argument does not go through because “men” is used as “humans” in P1 and as “males” in P2.

Disambiguation:

**valid (with “males”):**

~~P1: Only males can speak rationally.~~

**P2: Women are not males.**

---

C: Therefore, women cannot speak rationally. ✓ | –

**valid (with “humans”):**

**P1: Only humans can speak rationally.**

~~P2: Women are not humans.~~

---

C: Therefore, women cannot speak rationally. ✓ | –

**true premises:**

**P1: Only humans can speak rationally.**

**P2: Women are not males.**

---

C: Therefore, women cannot speak rationally. ✗ | ✗



## Red herring (similar to moving targets)

tries to distract from the actual argument by changing the topic

<https://www.youtube.com/watch?v=zLS-npemQYQ>





## **Argument from bad argument**

arguing that an argument is a bad argument and that thus the conclusion can be dismissed

Mr. Jones argues that the unemployment rate will rise this year.  
However, as we have explained, Mr. Jones' argument is clearly invalid.  
Furthermore, we have shown that all the premises of the argument are false. Therefore, Mr. Jones is wrong. We can conclude that the unemployment rate will not rise this year.

## Straw man

someone tries to ascribe a much more unfavourable argument to someone than they actually advocated

A: Evolution theory it true.

B: So you believe that we are no different from chimpanzees? This is implausible, because we obviously are. I mean, just look at all our cultural achievements...!



<https://www.smbc-comics.com/comic/straw-men>



## Begging the question/*Petitio principii*

the argument presupposes its conclusion

- P1: For critical systems, it suffices to use a design pattern called “Security through Obscurity” in order to make it secure.
- P2: If P1, then no other measures but Security through Obscurity are needed to secure critical systems.
- P3: If no other measures but Security through Obscurity are needed to secure critical systems, then Security by Obscurity is sufficient for securing a critical system.
- 
- C: Security by Obscurity is sufficient for securing a critical system.

Preference satisfaction is the only intrinsic value, since all other values are derived from preference satisfaction.

The MacBook was not worth its money, because it was completely overpriced.

Saarbrücken is east of Paris, for Paris is west of Saarbrücken.

## No-True-Scotsman

an ad hoc immunization of an argument by dismissing a counterexample because it is not a *real* instance of X

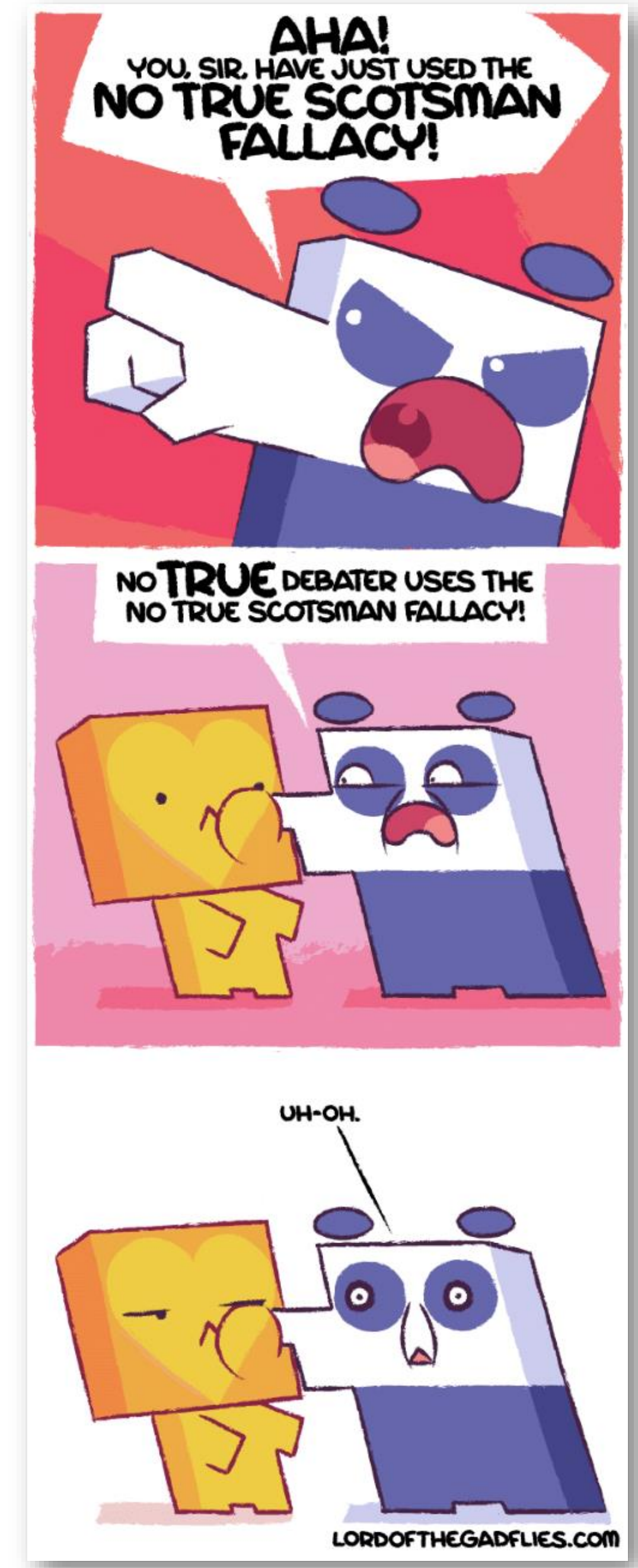
A: Every Scotsman likes whiskey.

B: Paul is a Scotsman, but he does not like whiskey.

A: Well, then Paul isn't a *real* Scotsman.

If you have ever been in love, then you had butterflies in your stomach, and if you did not have butterflies in your stomach, you were not *really* in love.

A *real* filter bubble is harmful, so we need to do something against filter bubbles ASAP.





**Post hoc ergo propter hoc** (lat. “after this, therefore because of this”)  
something happened after something else, so it happened because of this

“Yesterday I broke the mirror under the ladder on which the black cat sat. So that’s probably why I’m having a bad day.”

**Cum hoc ergo propter hoc** (lat. “with this, therefore because of this”)  
something happened while something else happened, so it happened because of this



Bert: “You still have that banana in your ear?”  
Ernie: “What?”  
Bert: “I said: you still have this banana in your ear!”  
Ernie: “Yeah, Bert, I know!”  
Bert: “You know? Ernie, why is that banana still in your ear?”  
Ernie: “Listen, Bert, I use this banana to keep the alligators away!”  
Bert: “Alligators? Ernie, there are no alligators on sesame street!”  
Ernie: “Right, it’s doing a good job, isn’t it, Bert?”



## False dilemma/false dichotomy

the impression is created that there are only two possibilities, while there are actually more than two possibilities

- P1: We should either introduce autonomous cars now or should accept that we let more people die in traffic than necessary.
- P2: We should not accept that we let more people die in traffic than necessary.
- 
- C: We should introduce autonomous cars now.

I thought you cared about the environment?  
Why are you still having a car then?

You either believe in god or you are without morals.

Gender:  
☐ male  
☐ female

## **Ad hominem** (lat. “to the person”)

instead of attacking the argument, you attack the author of the argument

### 1. **tu quoque** (lat. “you also”) or **Whataboutism**

“It do not believe in all this talk of climate change. Even Greta was spotted using plastic cups!”

### 2. **guilt by association**

“Yeah, sure, we all should become vegetarians. You know who else was a vegetarian? Hitler!”

### 3. **genetic attack**

“Of course you are in favour of preventing the rise of the sea level, since your parents are from Amsterdam!”

### 4. **deflection by insult**

“I know that you think that we should send our kids to a different school, but you’re a moron!”

### 5. ...

## Slippery slope

tries to make the case that a relatively small first step would lead to unfavourable consequences, because this starts a chain of unfavourable effects

If we allow Emma to buy this skirt now, then next she wants to have pink hair and an undercut, and then a piercing, and then a tattoo, and then she'll drop out of school, get her tongue split and becomes a drug addict! So I say no to the skirt!

If we let in more immigrants now, we have to invite the whole world!



## **Appeal to nature (also naturalistic fallacy)**

arguing that something is good solely because it is natural or bad solely because it is unnatural

P1: Survival of the fittest is a core principle of evolution.

P2: If P1, then survival of the fittest is natural.

P3: If survival of the fittest is natural, then capitalism is natural.

P4: If capitalism is natural, then it cannot be denied to be the right economic system.

---

C: Capitalism cannot be denied to be the right economic system.

Homeopathy is all natural, so it is superior to conventional medicine.

Smoothies are only made from fresh fruit, so they are good for you.

## Appeal to ignorance

it is argued for a conclusion by the lack of evidence (or certainty) for contrary conclusion

P1: Nobody can disprove the existence of reptoids.

P2: If nobody can disprove the existence of reptoids, we have to  
assume that there are reptoids.

---

C: We have to assume that there are reptoids.

A: Vaccines are not harmful.

B: You do not know that for sure!

A: No, but I am sure enough that they are beneficial.

B: Yes, but you cannot prove that!

## **Appeal to tradition**

an argument that promotes a certain thing or practice solely for it being traditional

Humans have always been eating meat, so there is no reason to stop now.

My grandfather, my father and I all have “Paul” as a second name, so our son should have “Paul” as a second name, too.

Marriage has traditionally been between a man and a woman, so we should not allow gay marriage.



## **Hasty generalization**

generalizing, but having seen too few instances to make a proper generalization

It is much colder than usual this year, so global warming is fake news.

## **Essentializing**

trying to conclude to an essential property of something or someone by having seen only a very few instances

He definitely cheats on his wife. I went to uni with him and there he always had many girls at one.  
He has the personality of a cheater.

## Is-ought fallacy

trying to derive an “ought” from an “is”

Marihuana is an illegal drug, so Marihuana should be forbidden.

Women should earn less than men, because they do earn less than men and there, presumably, is a very good reason for it.

P1: Deep learning can be used to substitute juries in a court.

P2: If P1, then deep leaning should be used to substitute juries in a court.

---

C: Deep leaning should be used to substitute juries in a court.

## Special Pleading

making a general claim but at the same time claiming that oneself is an exception

“I think it is disgusting, shameful, and damaging to all things American. But if I were twenty-two with a great body, it would be artistic, tasteful, patriotic, and a progressive, religious experience.”

Shelley Winters, on the topic of posing nude

## Galileo Gambit

appealing to Galileo (or a similar figure) in order to refute criticism, because people did not believe Galileo either

“Almost everyone thought Galileo was wrong, but he turned out to be right.”

Darin Brown (HIV sceptic)



## How to show that an argument is not suitable to support its conclusion

1

show that it has at least one false premise  
(standard way)

2

show that the inference does not work

for deductive arguments:

show that the argument is not valid

for defeasible arguments:

show that the argument is not defeasibly forceful

3

show that the reasoning is fallacious or that it is pseudo-reasoning

4

for defeasible arguments:  
show that there is a defeater

## How to show that an argument is not suitable to support its conclusion

