

## 2. The parts of argument



## Example: Terrorism and pandemics



In COVID's shadow, global terrorism has gone quiet but we should still be wary. Having lost its physical caliphate, Islamic State appears to have lost its capacity, if not its willingness, to launch attacks around the world well beyond conflict zones. But we have seen this happen before. The September 11 attacks in 2001 were followed by a wave of attacks around the world. Since 2005, except for the Charlie Hebdo shootings in Paris in January 2015, al-Qaeda has been prevented from launching any major attacks in western capitals. Then in 2013, Islamic State emerged and brought a new wave of attacks. The hopeful rhetoric of the collapse of the IS caliphate leading to an end of the global campaign of terror attacks appears to have been borne out. While it's tempting to conclude that the ending of the current wave of international terrorist attacks by IS is due largely to the ending of the physical caliphate in Syria and Iraq, and a concomitant collapse of capacity, the reality is more complex.

The parallels with the epidemiology of viruses are striking. Terrorism works as a phenomenon that depends on social contact and exchange and expands rapidly in an opportunistic fashion when defences are lowered. Reasoning by analogy is imperfect, but it can be a powerful way of prompting reflection. The importance of this cannot be underestimated as intelligence failures in counterterrorism, like poor political responses to pandemics, are in large part failures of imagination. It is true we have successfully dealt with two waves of global terrorist attacks over the past two decades, but we have not dealt successfully the underlying source of infections. In fact, we have contributed, through military campaigns, to weakening the body politic of host countries in which groups like al-Qaeda, IS and other violent extremist groups have a parasitic presence. We now need to face the inconvenient truth that toxic identity politics and the tribal dynamics of hate have infected western democracies and that eliminating the viral spread of hateful extremism is extremely hard.

## Facebook is removing QAnon pages and groups from its sites, but critical thinking is still the best way to fight conspiracy theories

October 8, 2020 4.46pm AEDT

Matt Rourke / AP

Email

Twitter

Facebook

LinkedIn

content.button.print

Facebook has announced a ban on groups and pages identified with the rapidly growing QAnon conspiracy movement, which will cover both Facebook itself and the Facebook-owned Instagram.

QAnon is a far-right conspiracy theory that alleges, among other things, that US President Donald Trump is battling Satan-worshipping paedophiles and a global child sex-trafficking ring run by Democrats. While the movement began in the US, it has begun to attract followers in other countries, including Australia.

Facebook's ban escalates a policy announced in August that aimed to ban QAnon groups promoting violence, and comes as the social media giant attempts to slow the spread of disinformation on its platform in the lead-up to the US presidential election on November 3.

Twitter also banned "so-called 'QAnon' activity" in July. After Facebook's latest move, some QAnon adherents were quick to claim the ban itself was more

### Author



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### Disclosure statement

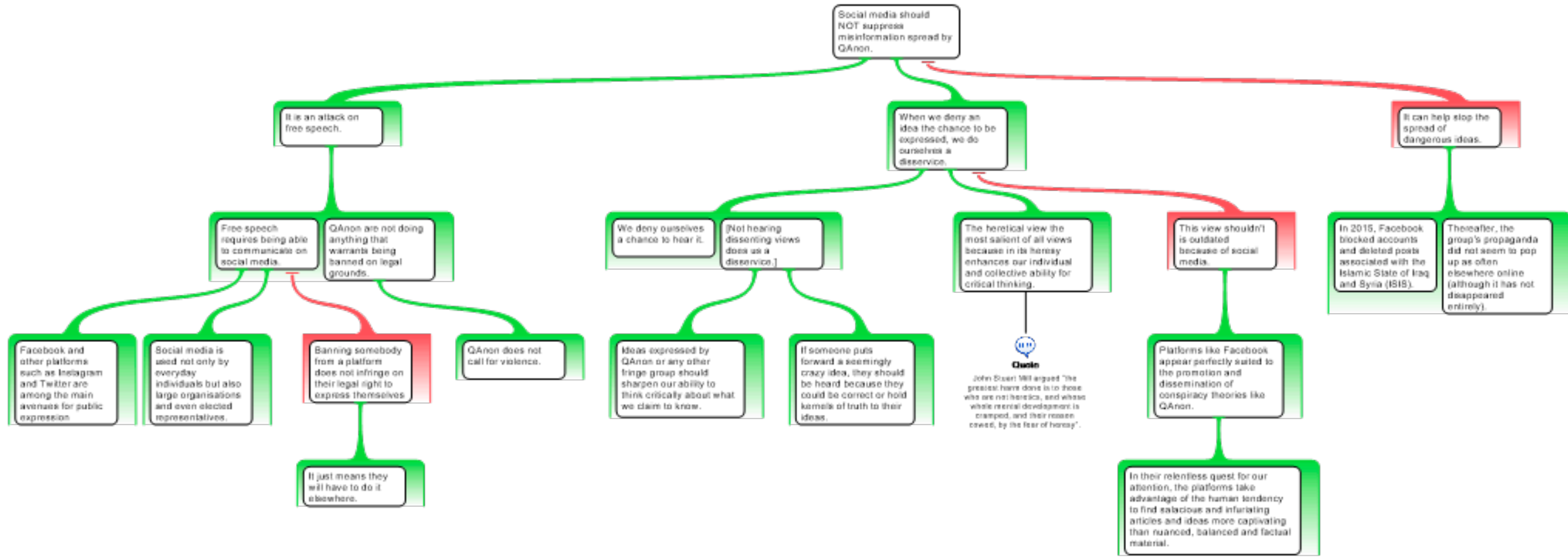
Shane Satterley does not work for, consult, own shares in or receive funding from any company or organisation that would benefit from this article, and has disclosed no relevant affiliations beyond their academic appointment.

### Partners



Griffith University provides funding as a member of The Conversation AI.

# The parts of arguments





## **2.1 Conclusions, reasons, and objections**

# Conclusions, reasons, and objections

**Samantha:** I think John Doe will be elected President. He is currently the most popular candidate, and the most popular candidate currently will be elected.

# Conclusions, reasons, and objections

**Samantha:** I think **John Doe will be elected President.** He is currently the most popular candidate, and the most popular candidate currently will be elected.

# Conclusions, reasons, and objections

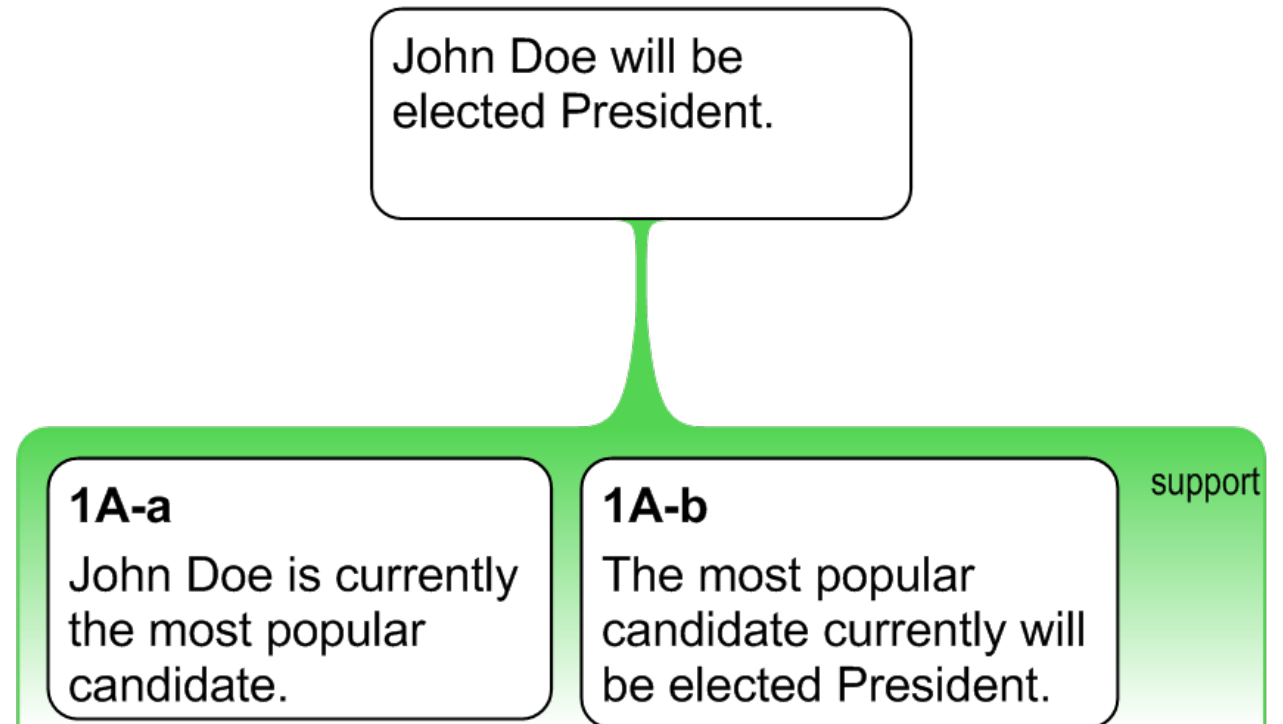
**Samantha:** I think John Doe will be elected President. **He is currently the most popular candidate, and the most popular candidate currently will be elected.**

The reason aims to support the conclusion



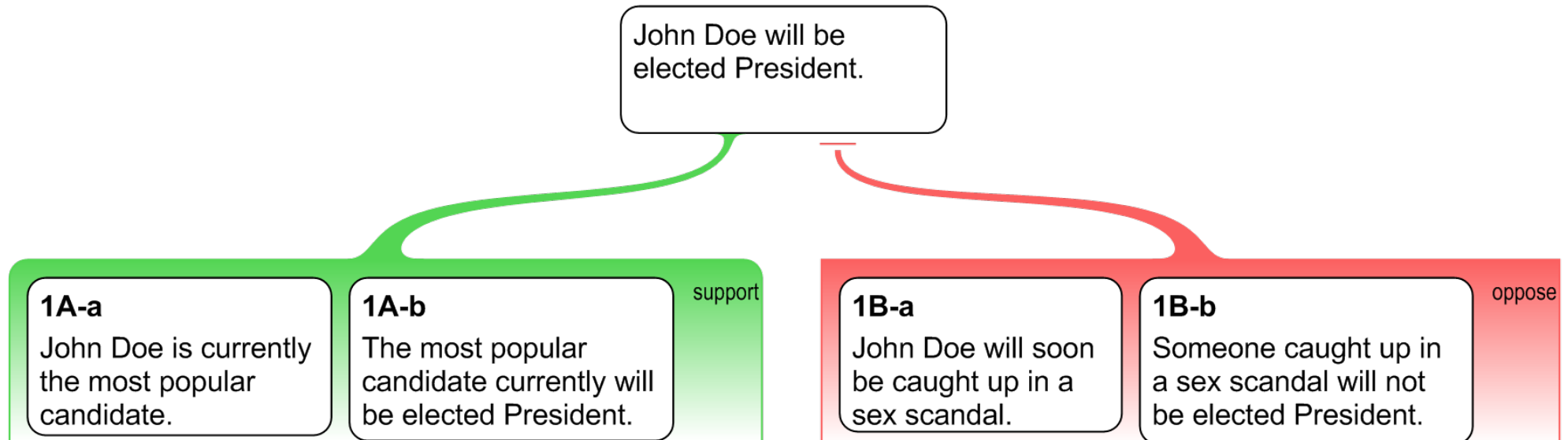
# Conclusions, reasons, and objections

**Samantha:** I think John Doe will be elected President. He is currently the most popular candidate, and the most popular candidate currently will be elected.



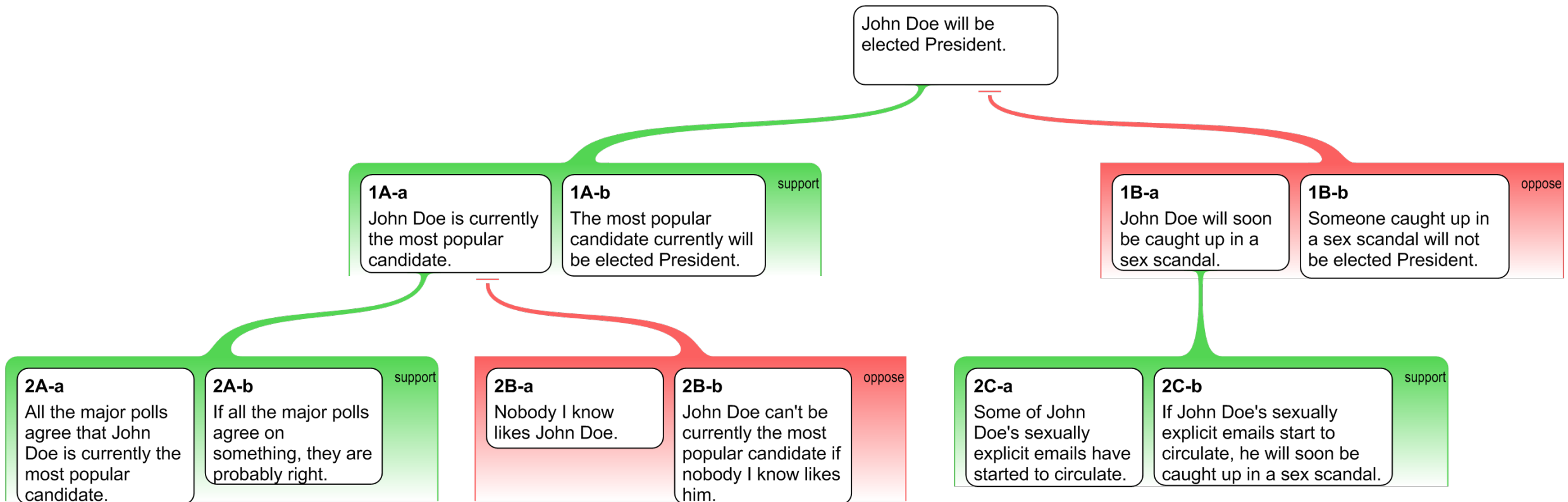
# Conclusions, reasons, and objections

**Neil:** I'm not so sure if John Doe will be elected, I heard that he will soon be caught up in a sex scandal and someone caught up in a sex scandal will not be elected President.



- Claims are **declarative sentences** (They assert that something is or isn't the case)
  - » They can be true or false
- Claims are the building blocks of arguments
- When claims are supported by reasons they are called conclusions (or contentions)
- When claims are given in reasons or objections they are called **premises**
- In an argument map each claim goes in a separate white box, called a **claim box**

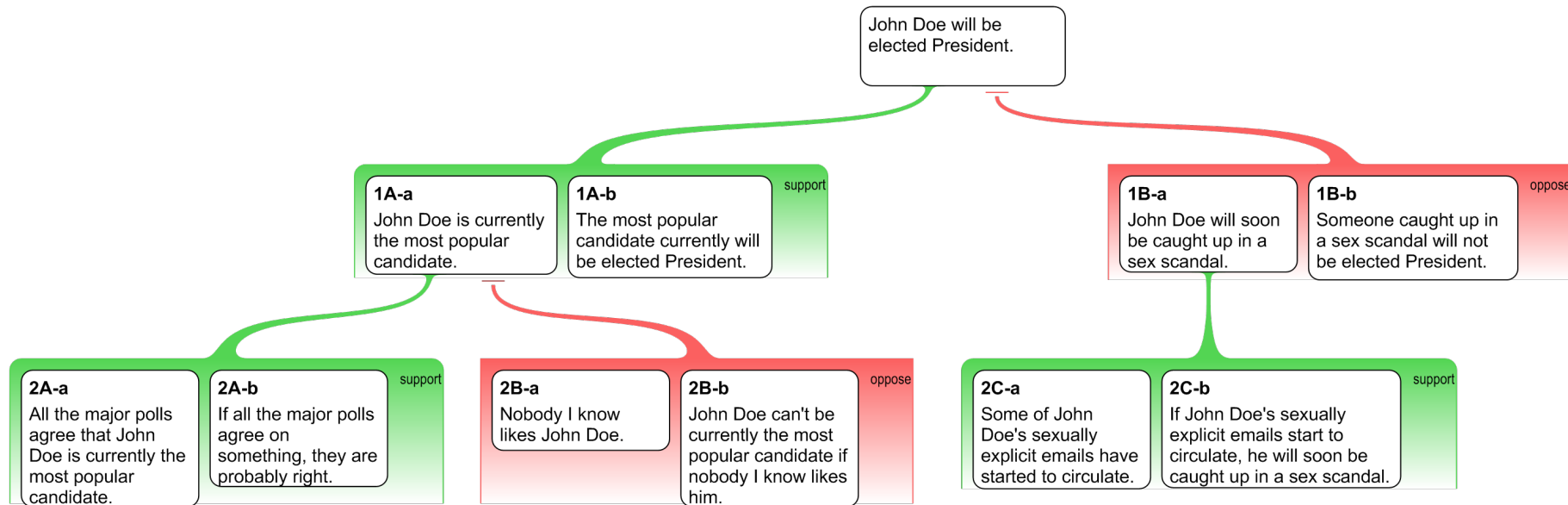
## Arguments can be made arbitrarily large





A claim can be both a premise and a conclusion. 1A-a is a premise for the final conclusion and a conclusion for 2A.

We will call these conclusions **intermediate conclusions** to help distinguish them from the final conclusion.



An **inference** =<sub>def</sub> an individual reason (or objection) and its conclusion (or disputed claim).

Maps enable us to isolate individual inferences, reducing the complexity of many arguments into bits that can be considered one by one.

In prose we use **indicators** to indicate the logical relations between claims.

Words like:

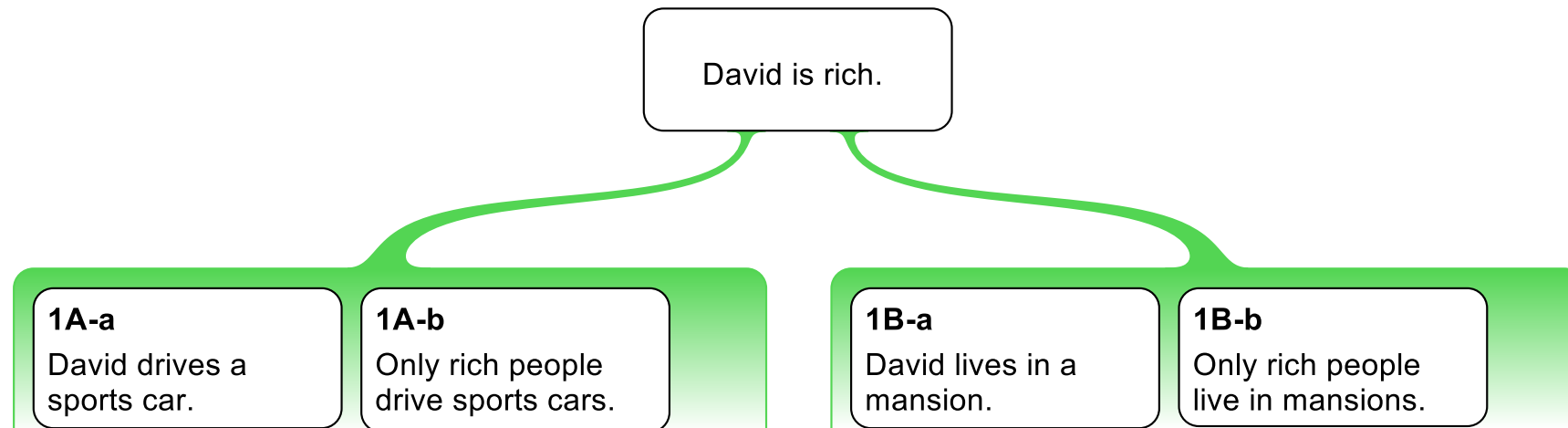
**hence, therefore, since, because, for, as, if and only if,  
if ... then, and, or**

and phrases like:

**it follows that..., we may assume, there are several reasons  
for thinking this..., it may be objected that...,**

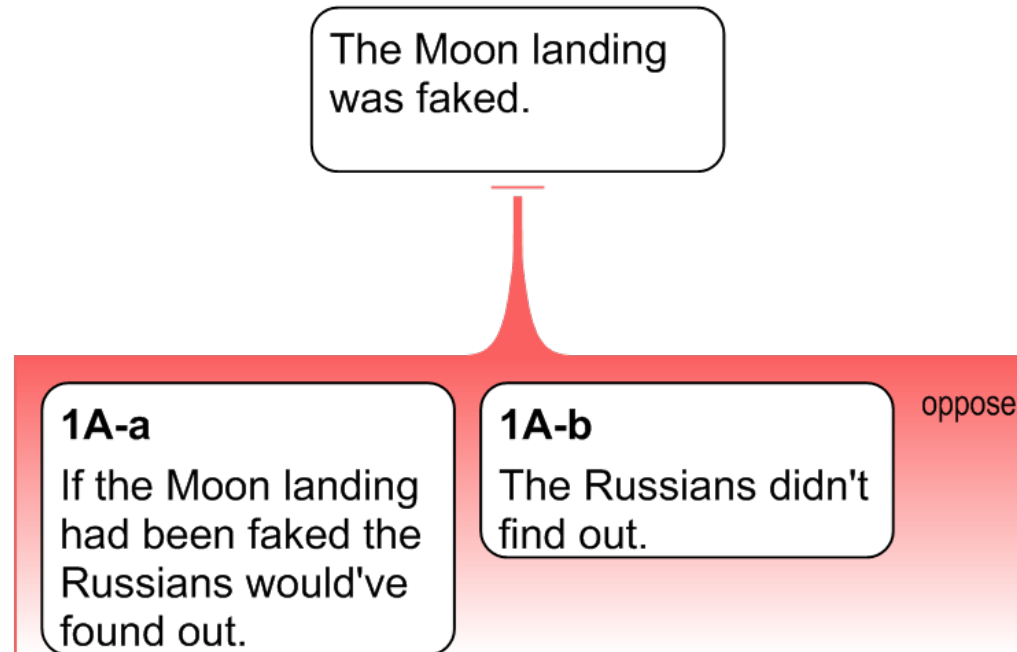
In an argument maps these relations are displayed visually, so indicator words are not needed, and should not appear in maps.

David is rich. **There are two reasons for thinking this: firstly**, he drives a sports car, **and** only rich people drive sports cars; **and secondly**, he lives in a mansion, **and** only rich people live in mansions.





Some people argue that the Moon landing was faked. **But this is false.** If the Moon landing was faked the Russians would've found this out, but the Russians didn't find this out.



# Example: JS Mill, On Liberty



“We have now recognised the necessity to the mental well-being of mankind (on which all their other well-being depends) of freedom of opinion, and freedom of the expression of opinion, **on four distinct grounds; which we will now briefly recapitulate.**

**First**, if any opinion is compelled to silence, that opinion may, for aught we can certainly know, be true. To deny this is to assume our own infallibility.

**Secondly**, though the silenced opinion be an error, it may, and very commonly does, contain a portion of truth; and since the general or prevailing opinion on any subject is rarely or never the whole truth, it is only by the collision of adverse opinions, that the remainder of the truth has any chance of being supplied.

**Thirdly**, even if the received opinion be not only true, but the whole truth; unless it is suffered to be, and actually is, vigorously and earnestly contested, it will, by most of those who receive it, be held in the manner of a prejudice, with little comprehension or feeling of its rational grounds. And not only this, but, **fourthly**, the meaning of the doctrine itself will be in danger of being lost, or enfeebled, and deprived of its vital effect on the character and conduct: the dogma becoming a mere formal profession, inefficacious for good, but cumbering the ground, and preventing the growth of any real and heartfelt conviction, from reason or personal experience.

Before quitting the subject of freedom of opinion, **it is fit to take some notice of those who say**, that the free expression of all opinions should be permitted, on condition that the manner be temperate, and do not pass the bounds of fair discussion. Much might be said on the impossibility of fixing where these supposed bounds are to be placed; for if the test be offence to those whose opinion is attacked, I think experience testifies that this offence is given whenever the attack is telling and powerful, and that every opponent who pushes them hard, and whom they find it difficult to answer, appears to them, if he shows any strong feeling on the subject, an intemperate opponent. **But this, though an important consideration in a practical point of view, merges in a more fundamental objection.** Undoubtedly the manner of asserting an opinion, even though it be a true one, may be very objectionable, and may justly incur severe censure. But the principal offences of the kind are such as it is mostly impossible, unless by accidental self-betrayal, to bring home to conviction. The gravest of them is, to argue sophistically, to suppress facts or arguments, to misstate the elements of the case, or misrepresent the opposite opinion. But all this, even to the most aggravated degree, is so continually done in perfect good faith, by persons who are not considered, and in many other respects may not deserve to be considered, ignorant or incompetent, that it is rarely possible on adequate grounds conscientiously to stamp the misrepresentation as morally culpable; and still less could law presume to interfere with this kind of controversial misconduct.”

# Example: Thomas Malthus, An Essay on the Principle of Population



**“In entering upon the argument I must premise** that I put out of the question, at present, all mere conjectures: that is, all suppositions, the probable realization of which cannot be inferred upon any just philosophical grounds

**I think I may fairly make two postulata.**

**First,** That food is necessary to the existence of man.

**Secondly,** That the passion between the sexes is necessary, and will remain nearly in its present state.

These two laws ever since we have had any knowledge of mankind, appear to have been fixed laws of our nature; and, as we have not hitherto seen any alteration in them, **we have no right to conclude that they will ever cease to be what they now are**, without an immediate act of power in that Being who first arranged the system of the universe; and for the advantage of his creatures, still executes, according to fixed laws, all its various operations.”

A **reason** =<sub>def</sub> a set of one or more claims that jointly provide grounds for accepting a claim.

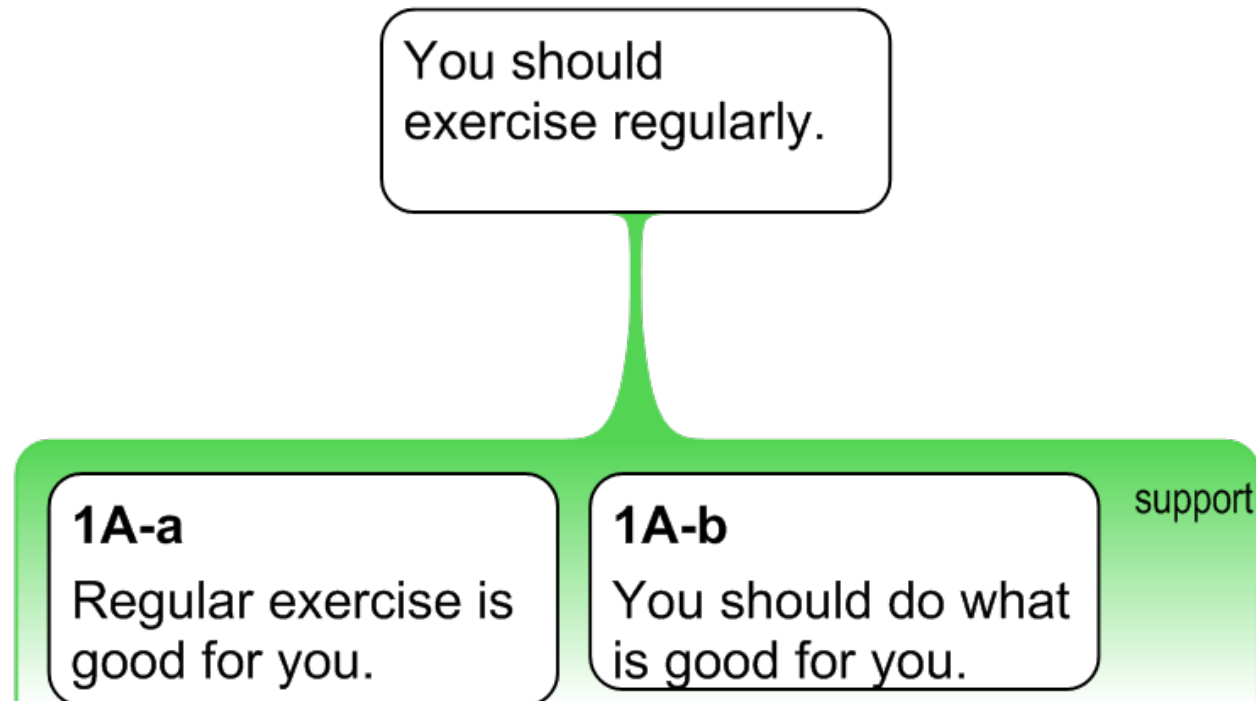
A reason supports a claim, increasing the probability that it is true.

- Strong reasons considerably increase the probability that the claim is true;
- Weak reasons only slightly increase the probability.

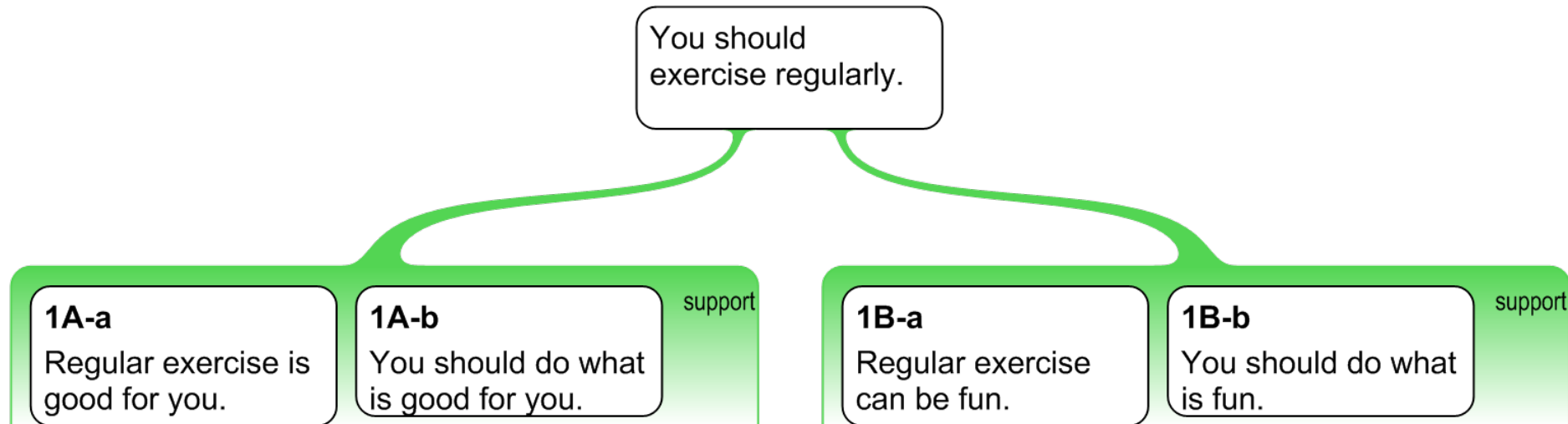
The claim that a reason is put forward to support is called a **conclusion**.



The reason here is **1A**, and it is made up of two claims, 1A-a and 1A-b.



A conclusion can be supported by more than one reason:



The reasons are **independent** of one another: if one of is rejected, the other still supports the conclusion as much as it did before.

What does “providing grounds for accepting” amount to?

If the reason is good, then it **increases the epistemic probability** of the conclusion.

Many ways of talking about this relation:

- A reason supports the claim
- A reason lends weight to the claim
- A reason lends credence to the claim
- A reason makes the claim more plausible
- A reason provides a basis for believing
- One can infer the conclusion from the reason

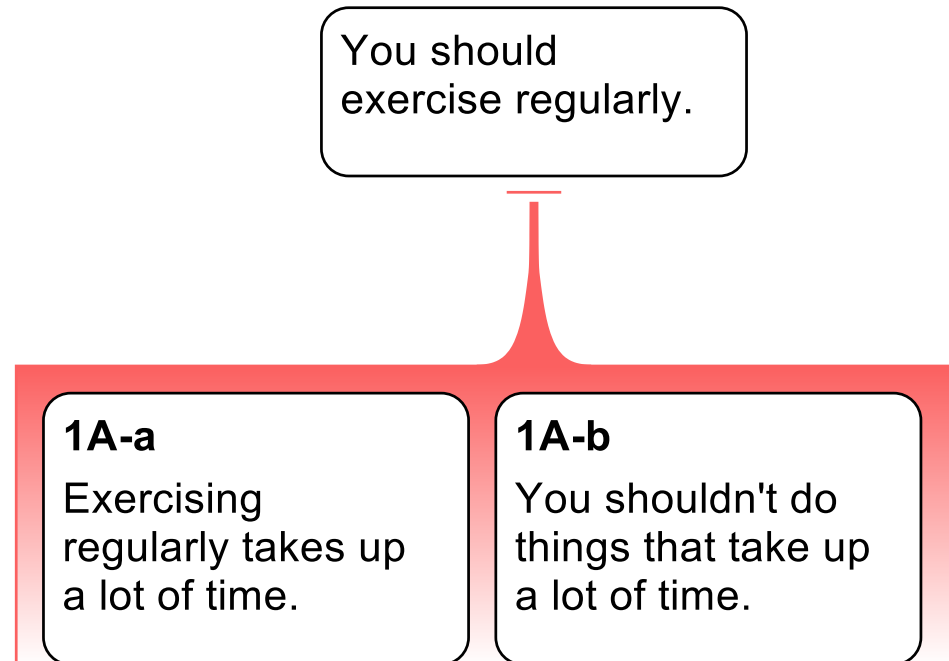
An **objection** =<sub>def</sub> a set of one or more claims that jointly provide grounds for not accepting a claim.

An objection weakens a claim, decreasing the probability that it is true.

- Strong objections considerably decrease the probability that the claim is true;
- Weak objections only slightly decrease the probability.

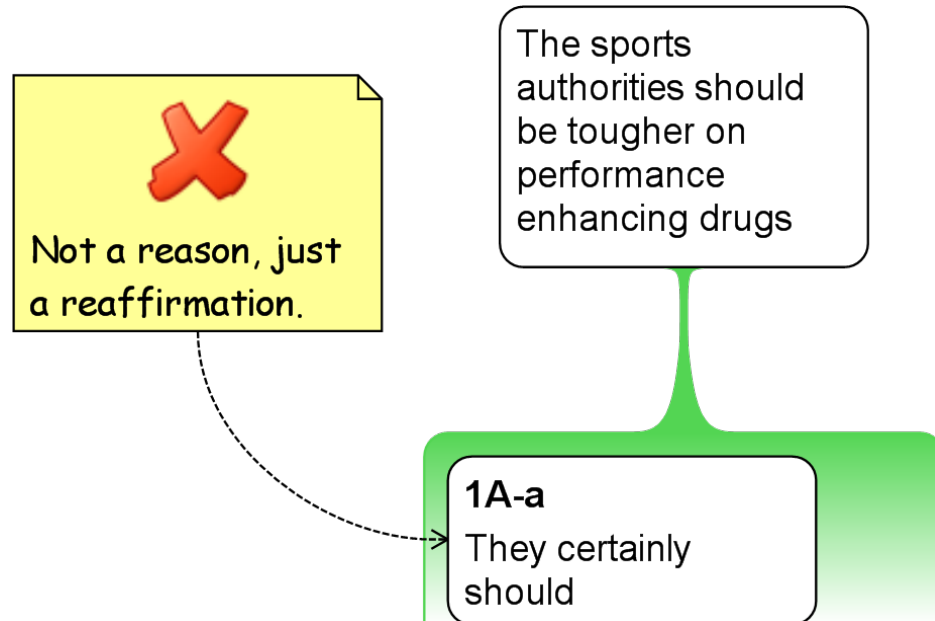
**Bill:** You should exercise regularly.

**Mary:** But exercising regularly takes up a lot of time, and you shouldn't do things that take up a lot of time.



# Reasons and agreements

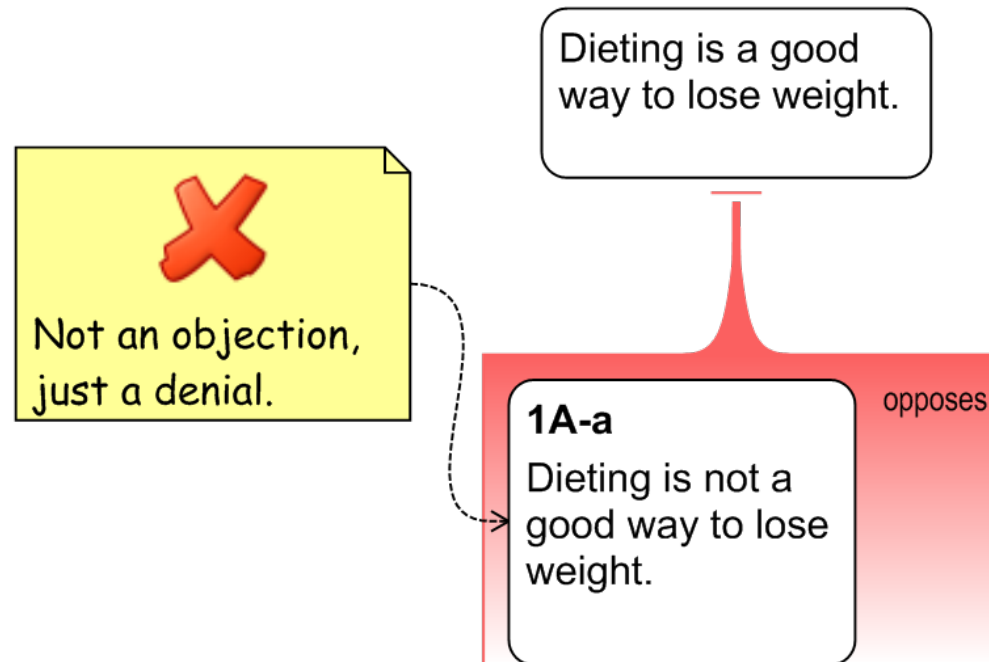
Merely agreeing with a claim does not constitute evidence in support of that claim.





# Objections and disagreements

Merely disagreeing with a claim does not constitute evidence against that claim.



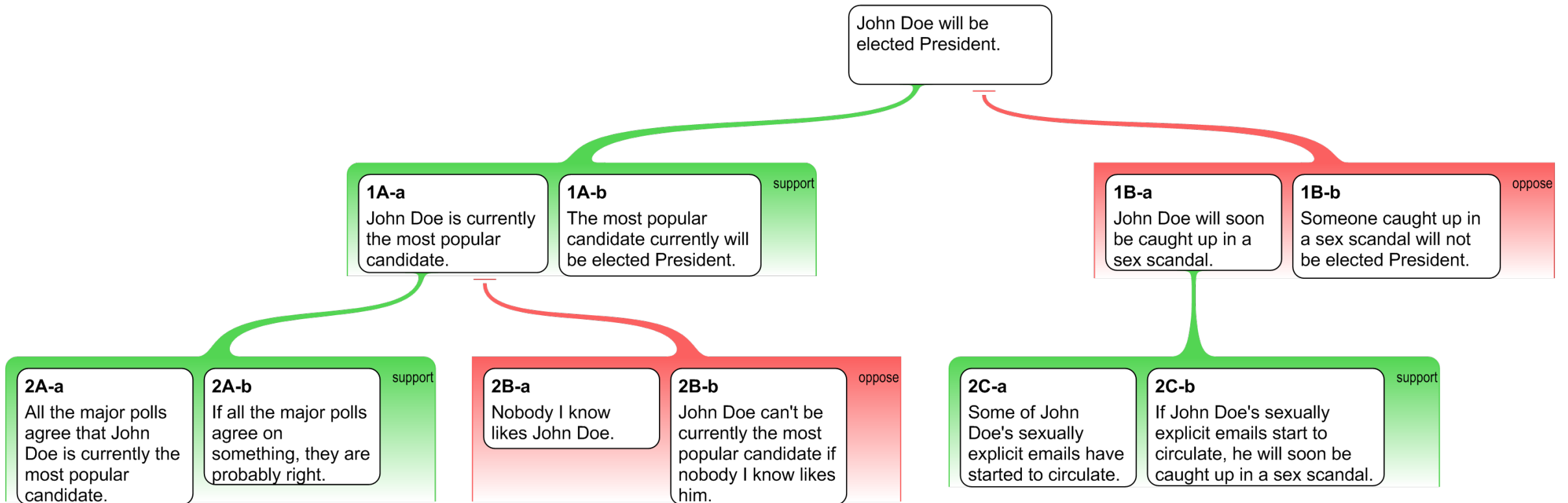
# Analysing inferences one by one

We can assess complex arguments by assessing the inferences from which they are composed.

Each reason and objection relates only to the conclusion of that particular inference unit.

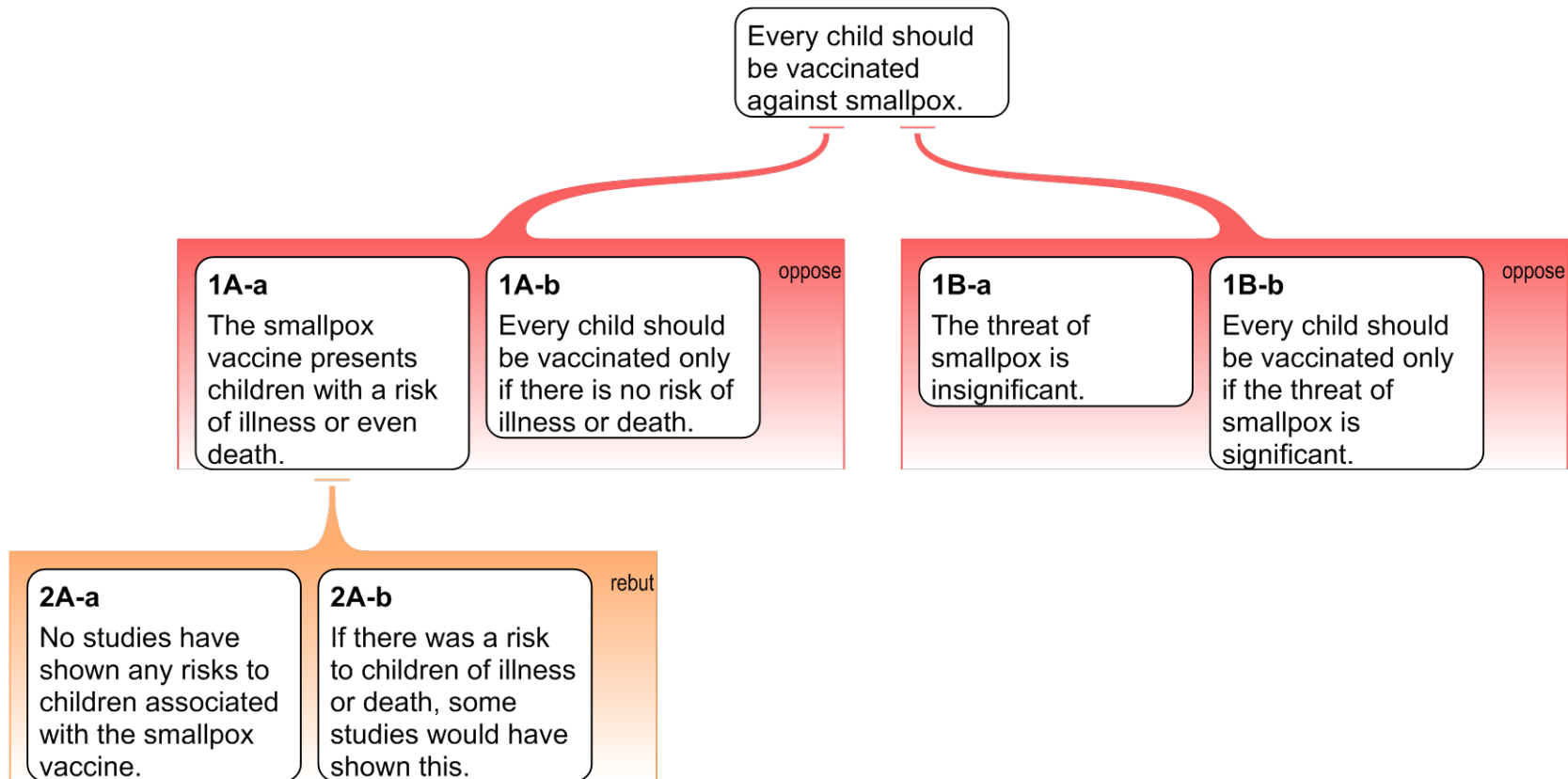
An objection may undermine a reason without refuting the final conclusion, for there may be other good reasons to believe the conclusion.

# Analysing inferences one by one



# Analysing inferences one by one

The same goes for objections: a rebuttal may weaken an objection without providing any evidence for the conclusion.



**Questions?**

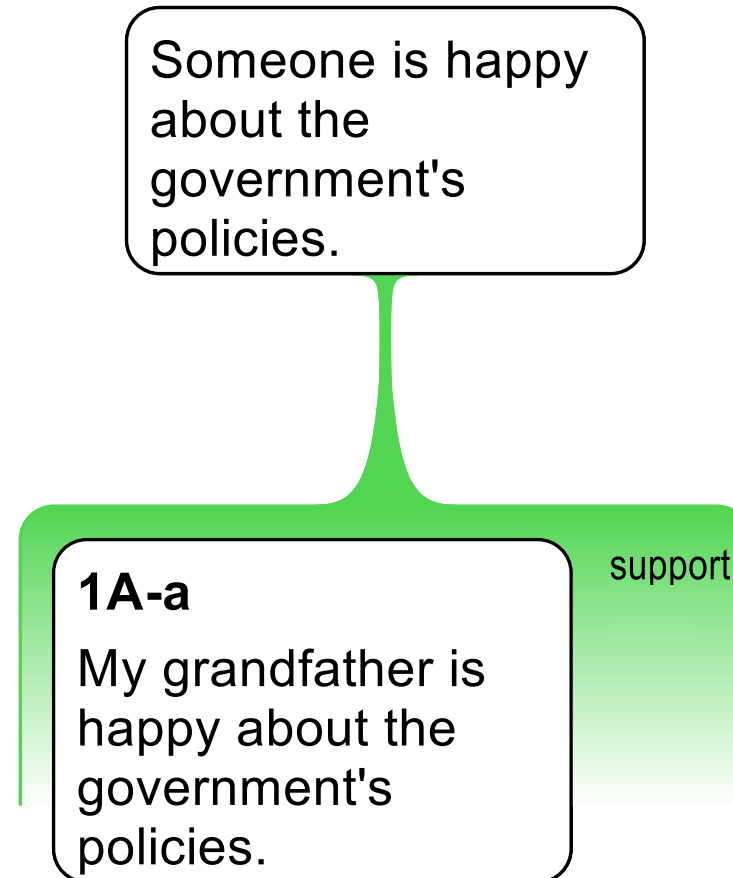
## 2.2 Premises & assumptions



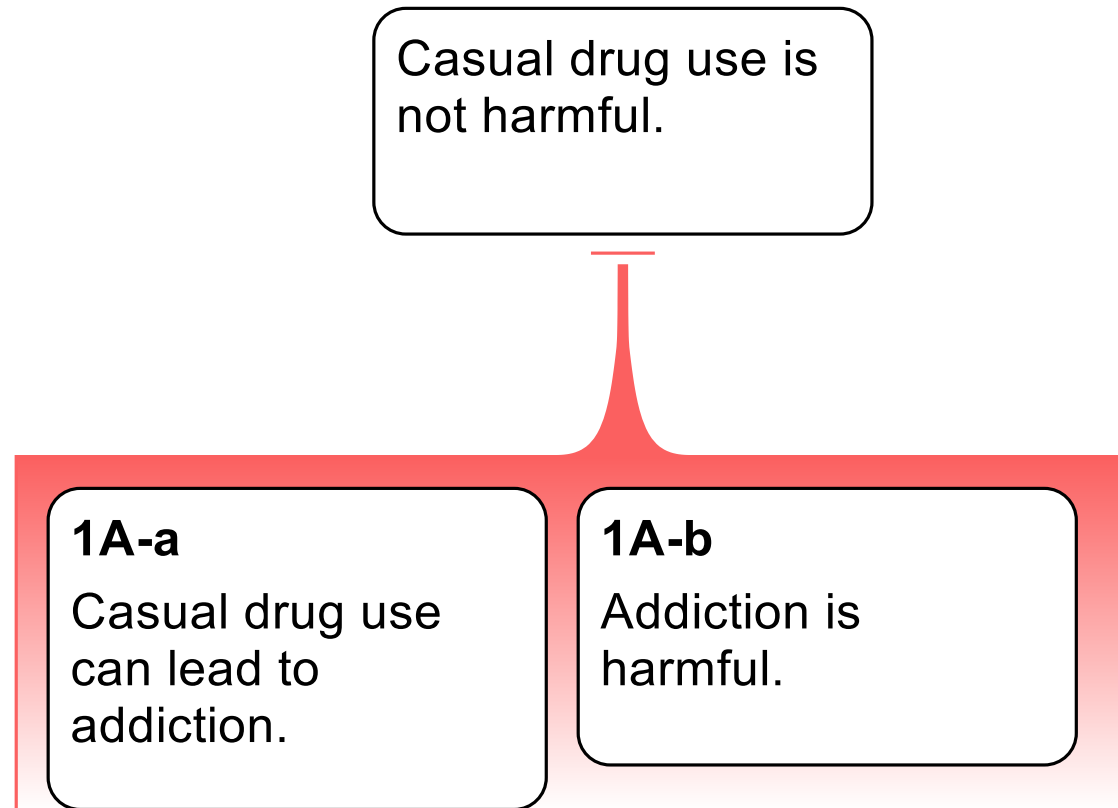
**Premises** =<sub>def</sub> claims that make up reasons and objections.

Premises may be supported by reasons or weakened by objections.

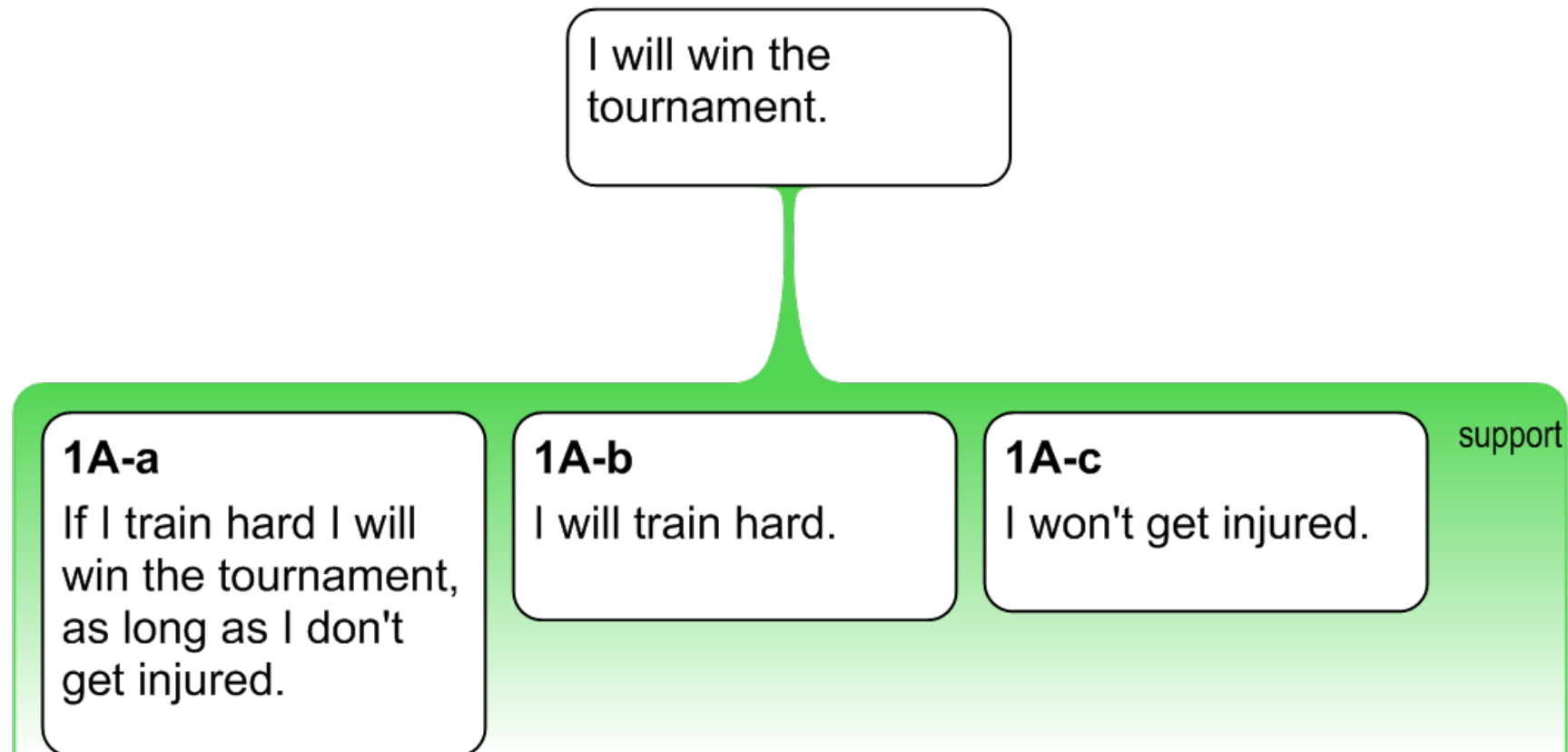
Reasons and objections may consist of a single premise, or more than one.



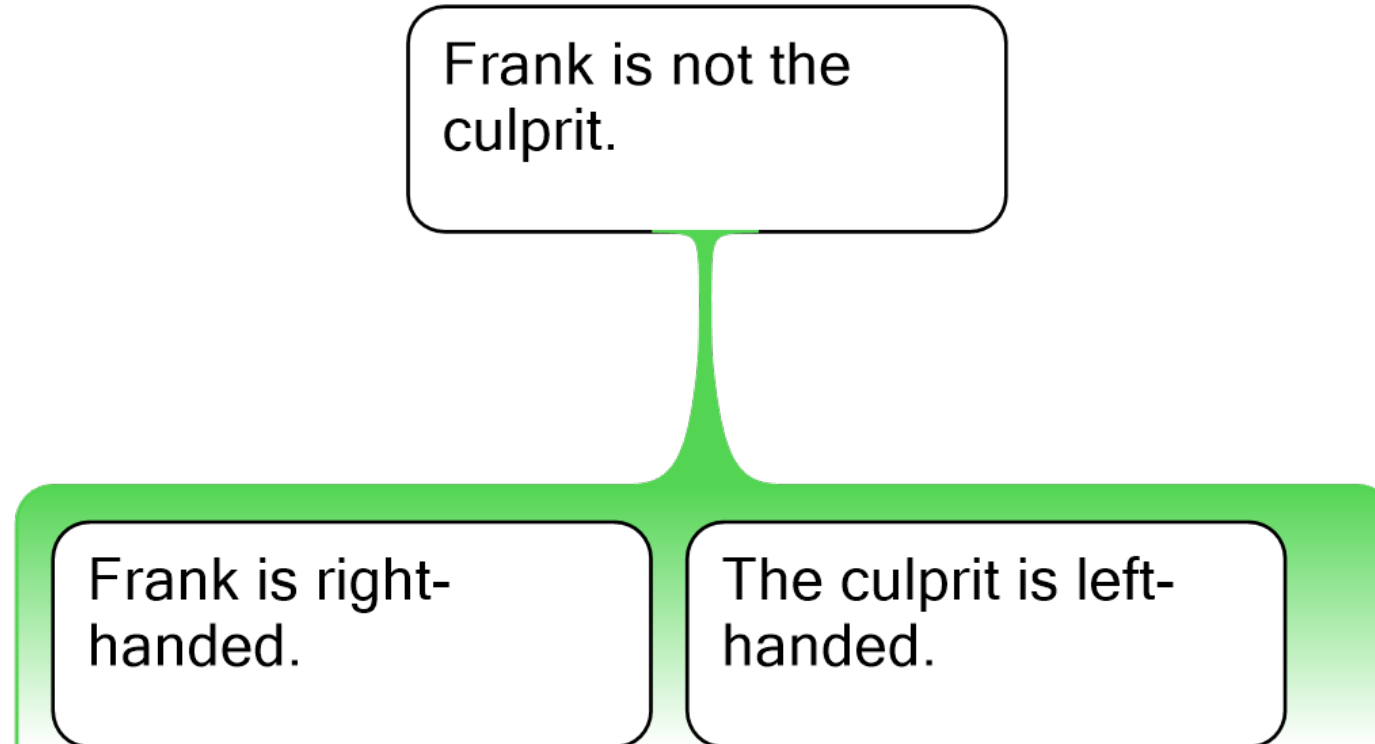
## A two-premise objection:



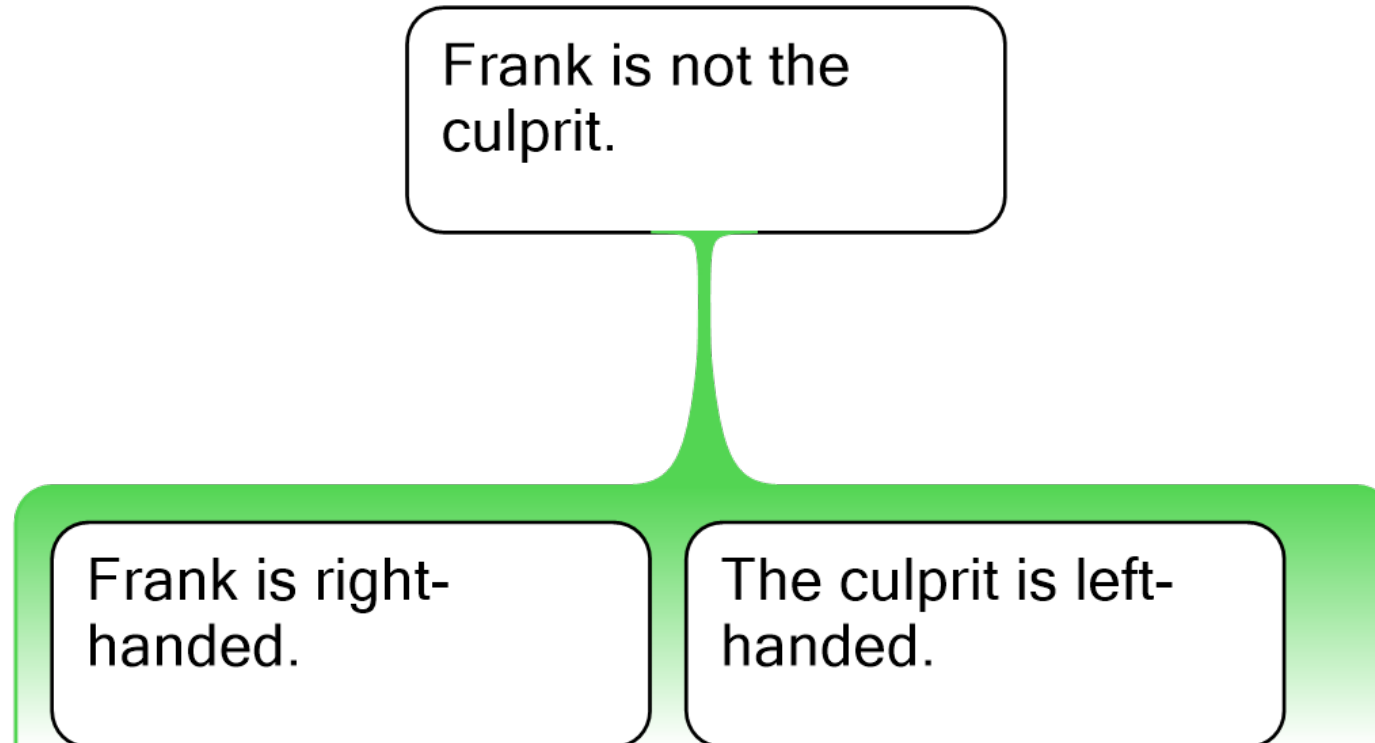
A three-premise reason:



**Co-premises** =<sub>def</sub> premises that work together to jointly provide evidence supporting (or weakening) the conclusion.



It is crucial to distinguish co-premises because each needs to be established.

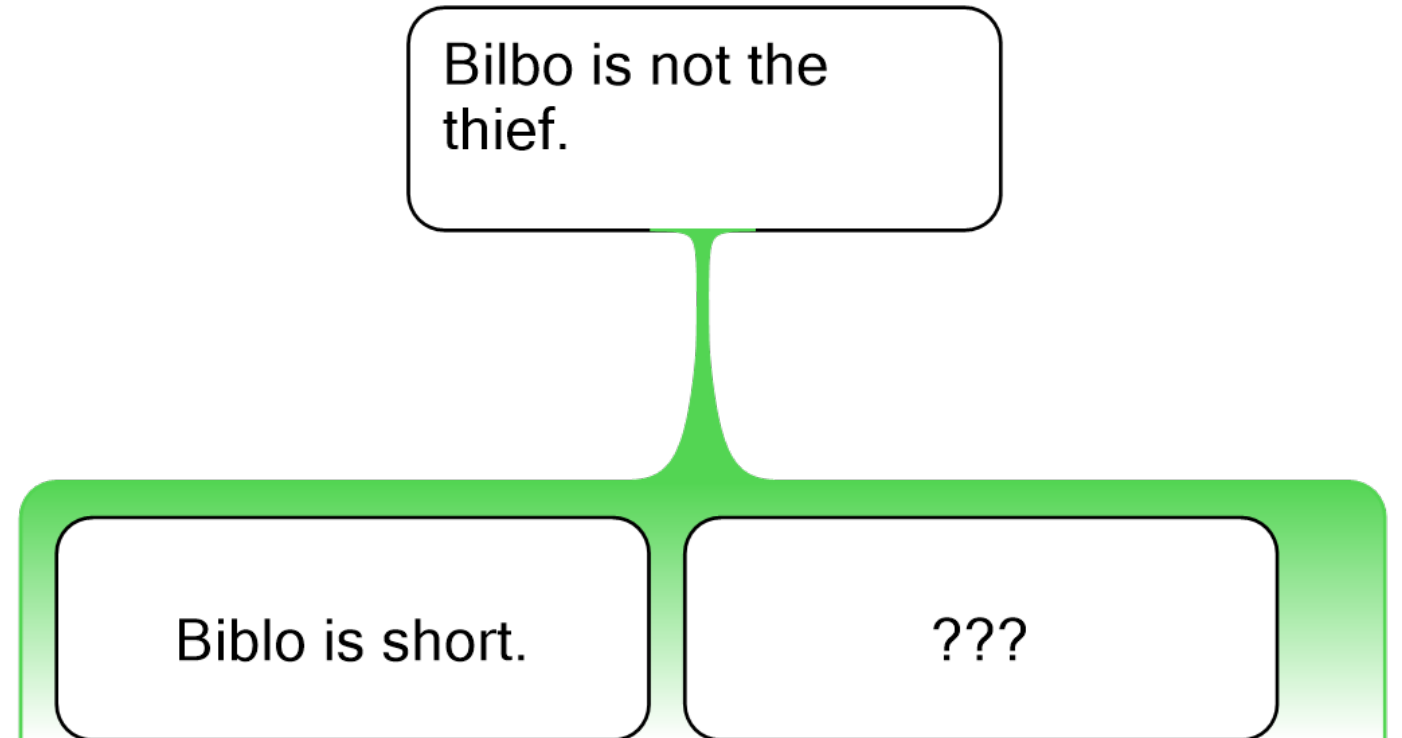


**Assumptions** =<sub>def</sub> unsupported premises.

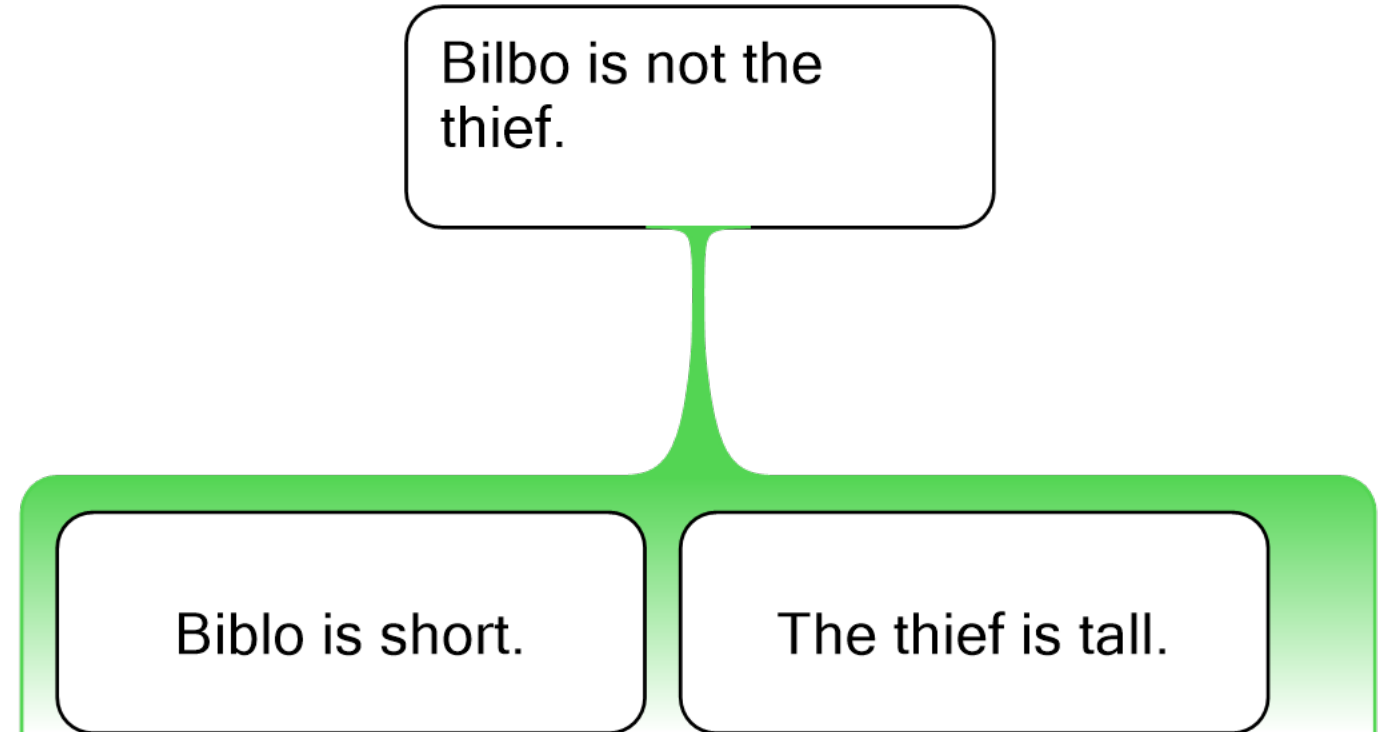
Often an assumption is left unstated, and we have to infer it from what else is claimed by the argument.



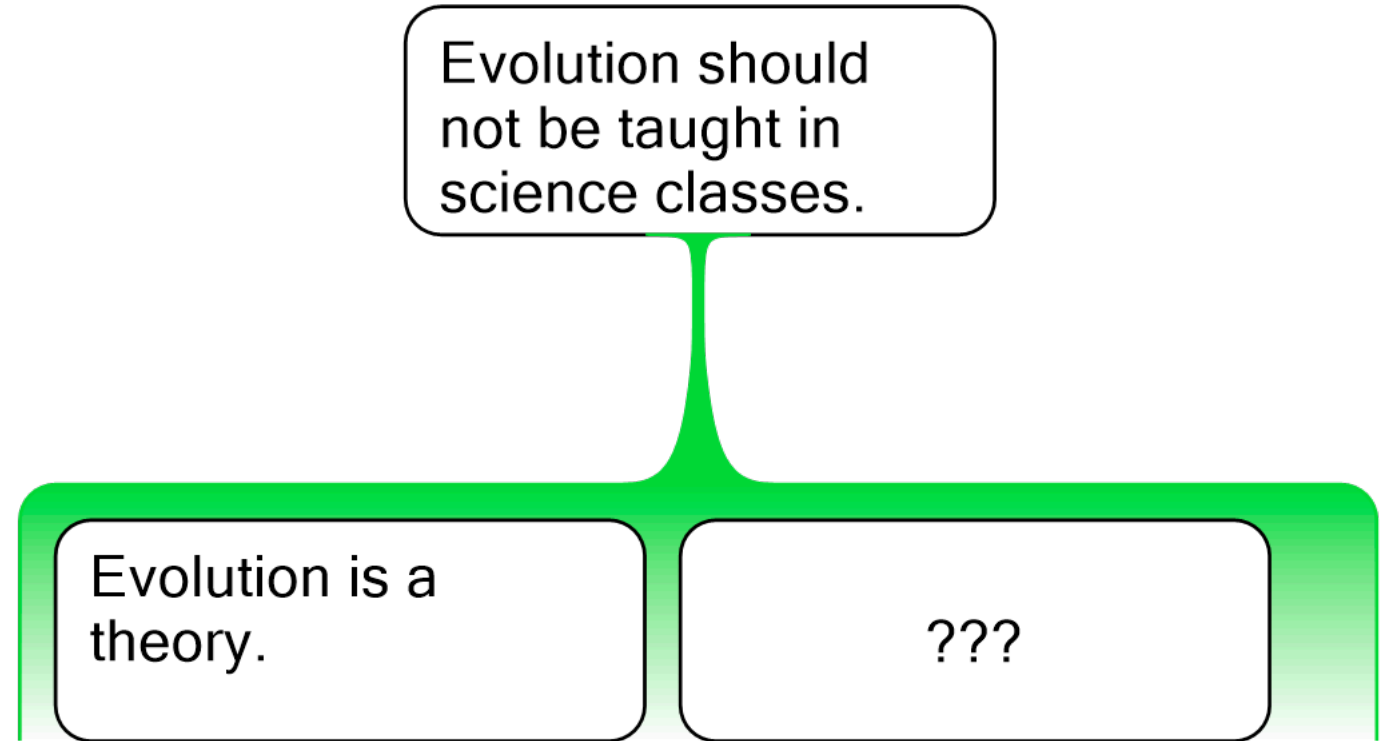
Bilbo is not the thief,  
**because** Bilbo is short.



Bilbo is not the thief,  
**because** Bilbo is short.



Evolution is a theory,  
**so** evolution should  
not be taught in  
science classes.



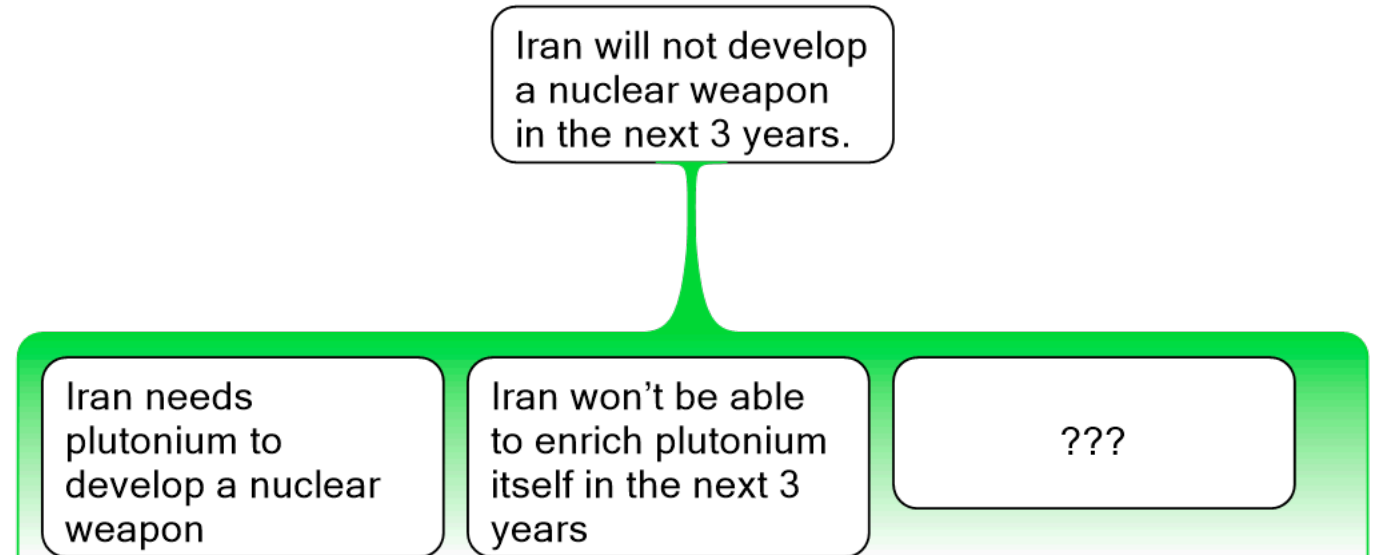
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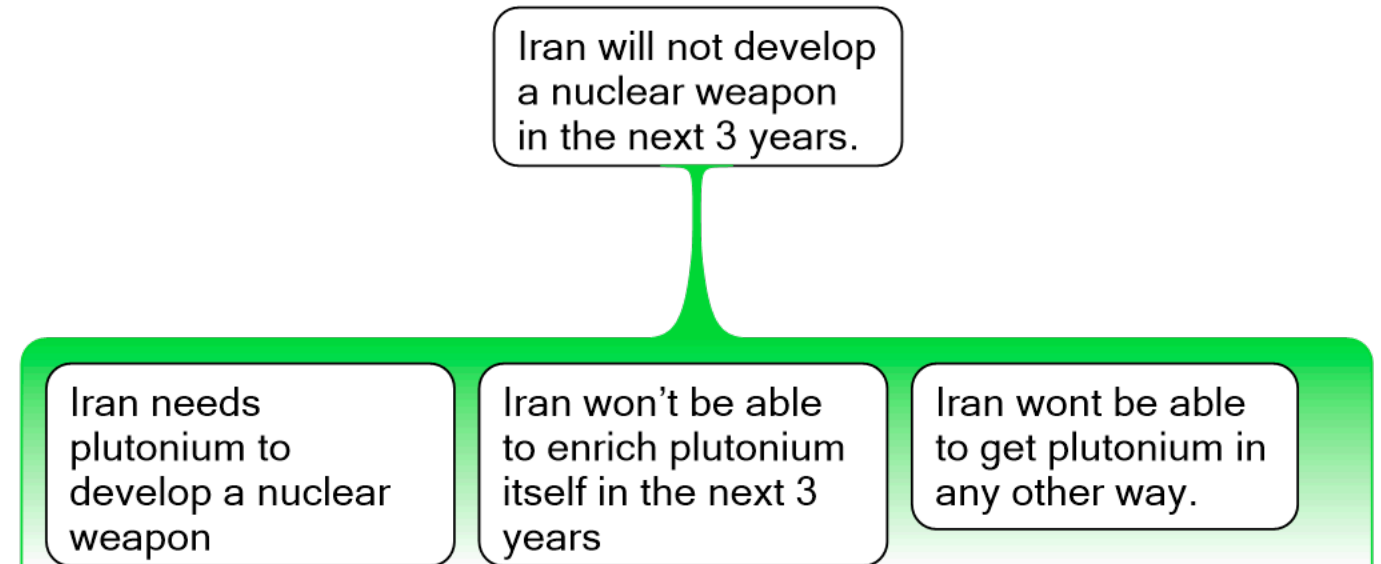
Evolution is a  
theory.

Theories should not  
be taught in  
science classes.

Iran will not develop a nuclear weapon in the next 3 years, **because** Iran needs plutonium to develop a nuclear weapon, and Iran won't be able to enrich plutonium itself in the next 3 years.



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- Know precisely how the reasoning works
- Each inference needs to be evaluated in turn
  - » Reasons and objections relate only to their specific conclusions
- Just because one line of reasoning fails doesn't mean the conclusion is unsupported; another line of reasoning might succeed
- Pinpoint problems in the reasoning and assess their strength



- Are there **indicator** words?
- What **type** of argument is the author making?
- Include **assumptions** and missing steps
- Don't be distracted by **non-argumentative** material
- Sometimes the argument structure will be **indeterminate** and there will be no such thing as *the* argument
  - » Still, some interpretations will be better than others

**Questions?**

### 3. Argument Mapping



**Jack:** FDR wanted America to enter the war. It is well documented that he knew it was essential for America to join the war effort to prevent the spread of totalitarianism. Furthermore, FDR knew that the Japanese were going to attack Pearl Harbour and he just let it happen. You wouldn't knowingly let the Pearl Harbour attack happen unless you wanted to enter the war.

**Jane:** But, no one in US Navy intelligence suspected a surprise attack on Pearl Harbour.

**Jack:** He would have known that it was a consequence of his economic efforts to hinder Japan's war in China.

**Jane:** Sounds like a conspiracy theory to me. Pearl harbour was so costly to the US Navy no US president would have let it happen. If FDR wanted war with Japan he would have found some other justification.

- Claims
- Conclusions
- Reasons
- Premises
- Co-premises
- Assumptions
- Objections and rebuttals
- Inferences
- Uncertainty

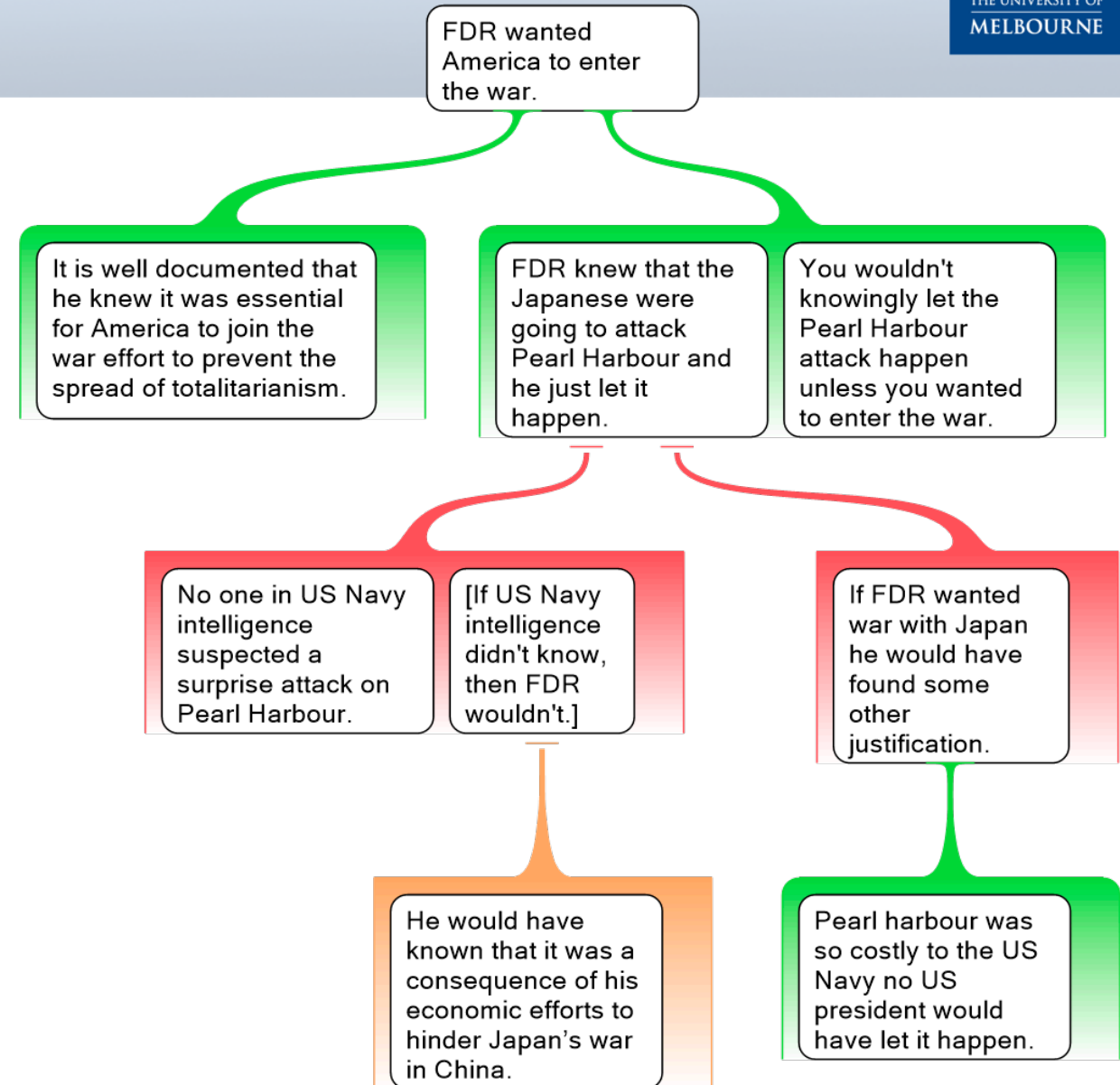
# Argument Mapping demo

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# Practice Exercises: Argument Mapping

Page 1

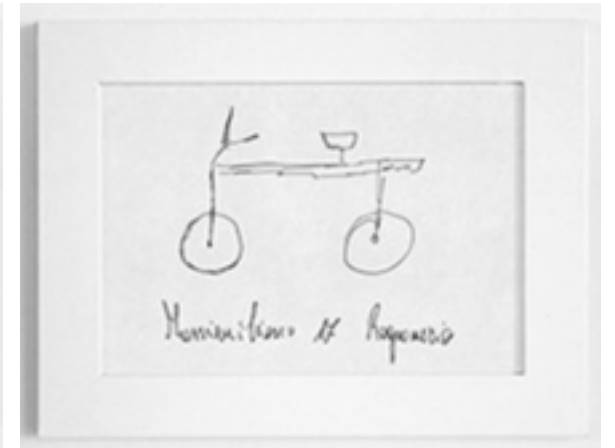
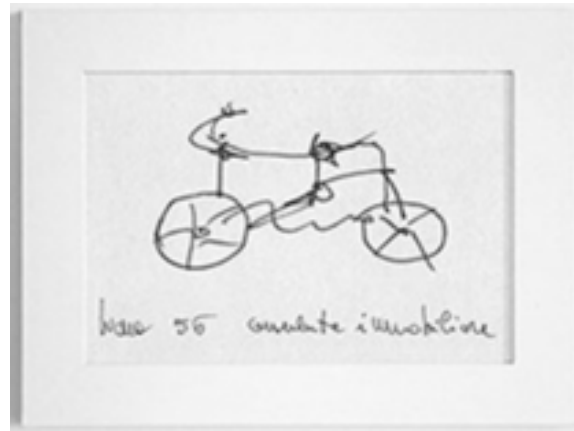
**Questions?**



## 4. Reasoning Structure



# Surface-level reasoning and underlying logic



# Practice Exercises: Reasoning Structure

Page 2

**Questions?**



## 5. Sound Inferences



# Validity & Soundness

🏠 > News > Politics

## Boris Johnson: My vision for a bold, thriving Britain enabled by Brexit

Follow ▼

**BORIS JOHNSON**  
FOREIGN SECRETARY

15 SEPTEMBER 2017 • 9:30PM



“And yes – once we have settled our accounts, we will take back control of roughly £350 million per week. It would be a fine thing, as many of us have pointed out, if a lot of that money went on the NHS”.



Brexit will result in a thriving Britain.

We will take back control of roughly £350 million per week.

[Britain could use that £350 million per week to thrive.]

It would be a fine thing, as many of us have pointed out, if a lot of that money went on the NHS.



Brexit will result in a thriving Britain.

We will take back control of roughly £350 million per week.

[Britain could use that £350 million per week to thrive.]

£350 million is roughly what we would send to the EU budget if it wasn't for the UK's budget rebate.

The impact on the economy from changes to trade after leaving the EU is likely to be far bigger than savings from the UK's membership fee.

It would be a fine thing, as many of us have pointed out, if a lot of that money went on the NHS.

THIS IS YOUR MACHINE LEARNING SYSTEM?

YUP! YOU POUR THE DATA INTO THIS BIG  
PILE OF LINEAR ALGEBRA, THEN COLLECT  
THE ANSWERS ON THE OTHER SIDE.

WHAT IF THE ANSWERS ARE WRONG?

JUST STIR THE PILE UNTIL  
THEY START LOOKING RIGHT.





**Donald J. Trump** ✓

@realDonaldTrump



Ice storm rolls from Texas to Tennessee - I'm in Los Angeles and it's freezing. Global warming is a total, and very expensive, hoax!

2:13 AM · Dec 7, 2013



3.1K



4.6K people are Tweeting about this

Global warming is a  
hoax.

The USA had a  
very cold winter in  
2013.

There was an ice  
storm from Texas  
to Tennessee.

Los Angeles was  
freezing.

Global warming is a  
hoax.

The USA had a  
very cold winter in  
2013.

[If global warming  
was real we  
wouldn't have cold  
winters.]

There was an ice  
storm from Texas  
to Tennessee.

Los Angeles was  
freezing.

Global warming is an  
increase in the average  
global temperatures,  
there will still be regional  
and sessional variation.

## Example: Validity 1



Harry was born in Wollongong.

Wollongong is in Australia.

Therefore,

Harry was born in Australia.

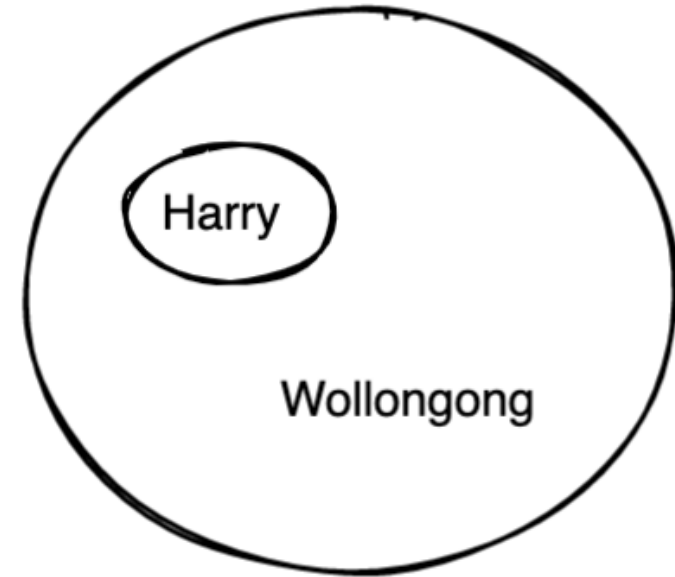
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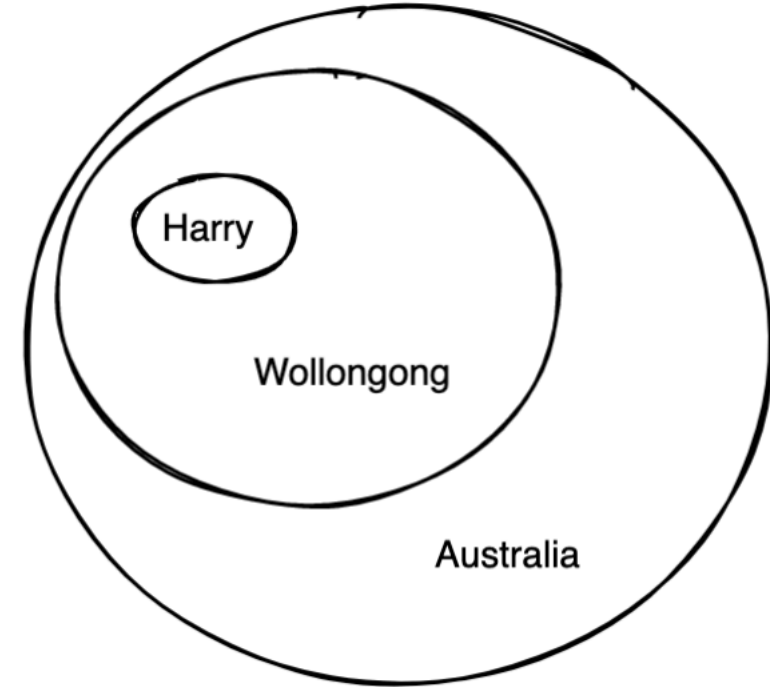
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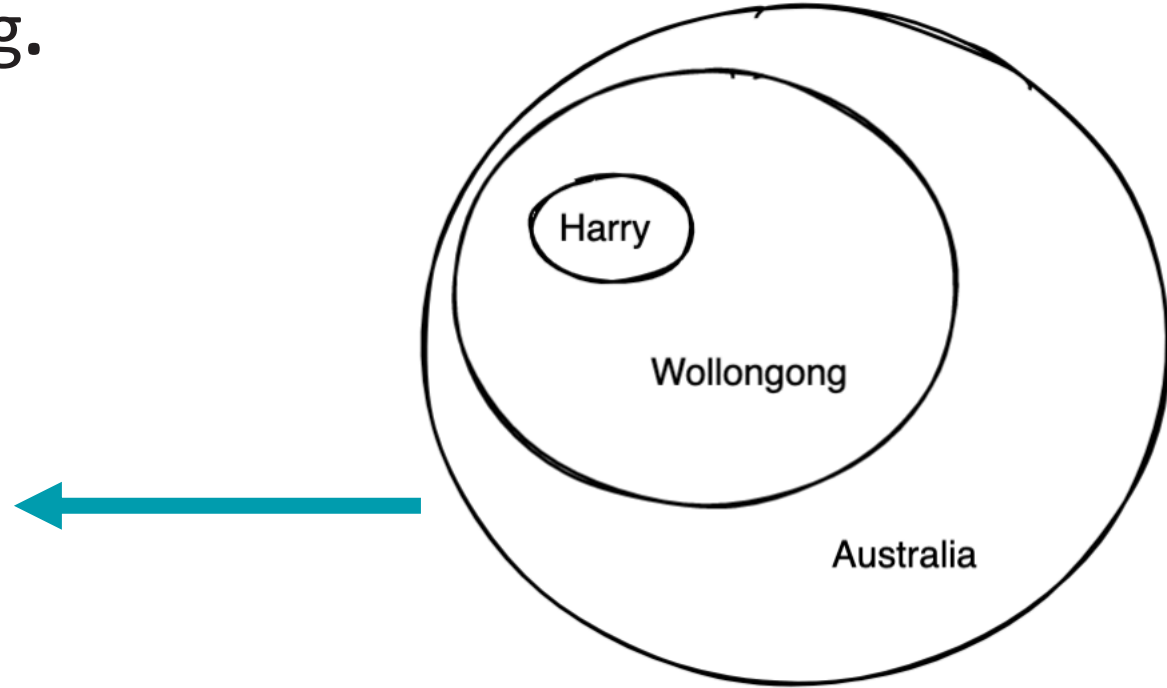
## Example: Validity 1

Harry was born in Wollongong.

Wollongong is in Australia.

Therefore,

**Harry was born in Australia.**



Valid

## Example: Validity 2



Harry was born in Australia.

Wollongong is in Australia.

Therefore

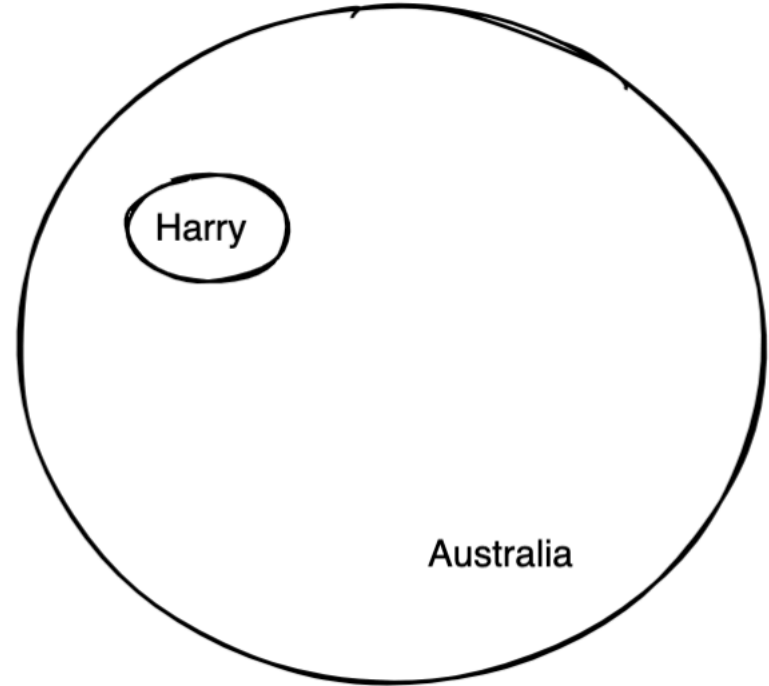
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**Harry was born in Australia.**

Wollongong is in Australia.

Therefore

Harry was born in Wollongong.

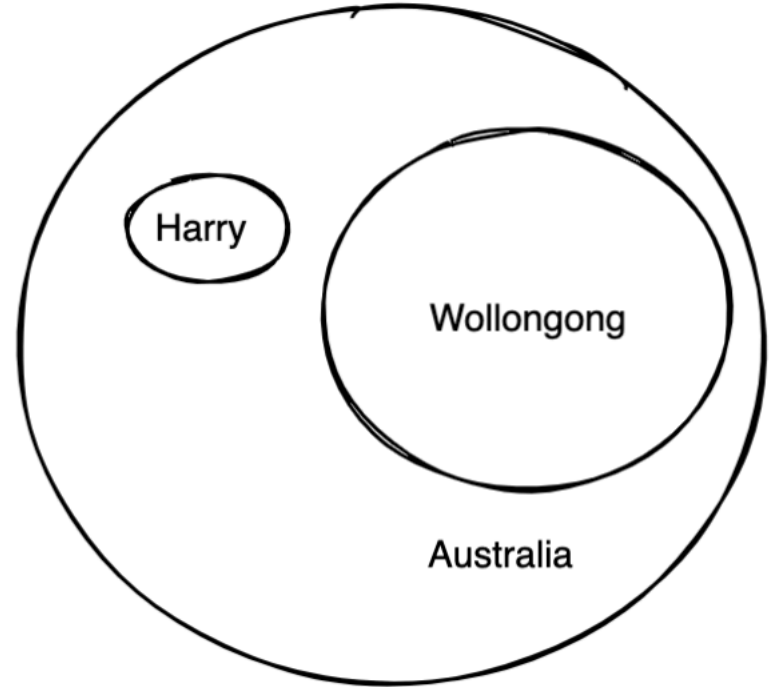


Harry was born in Australia.

**Wollongong is in Australia.**

Therefore

Harry was born in Wollongong.



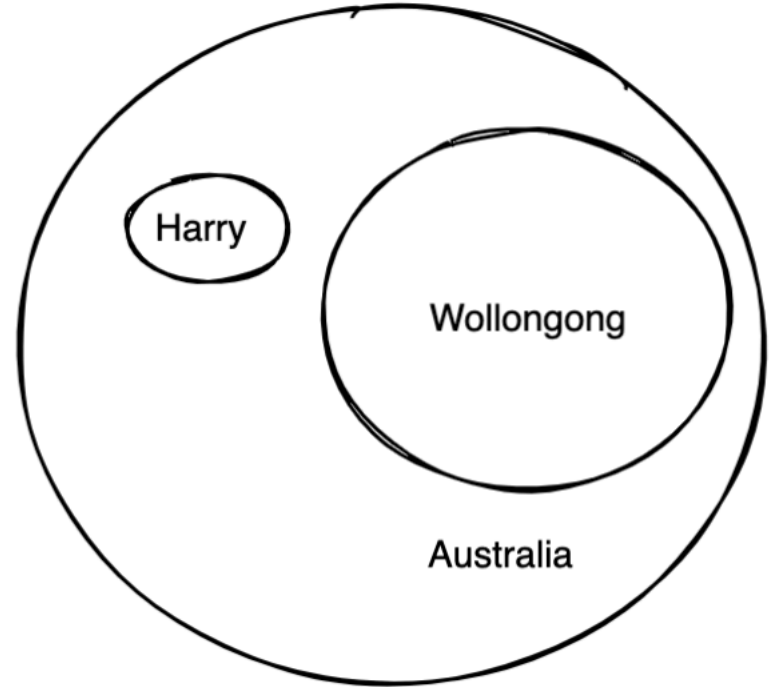
## Example: Validity 2

Harry was born in Australia.

Wollongong is in Australia.

Therefore

Harry was born in Wollongong.



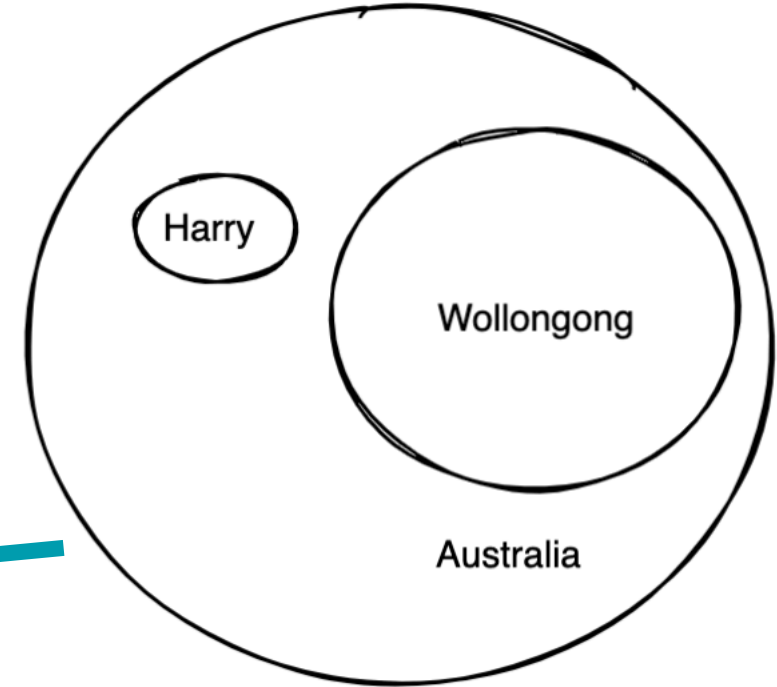
## Example: Validity 2

Harry was born in Australia.

Wollongong is in Australia.

Therefore

**Harry was born in Wollongong.**



Invalid

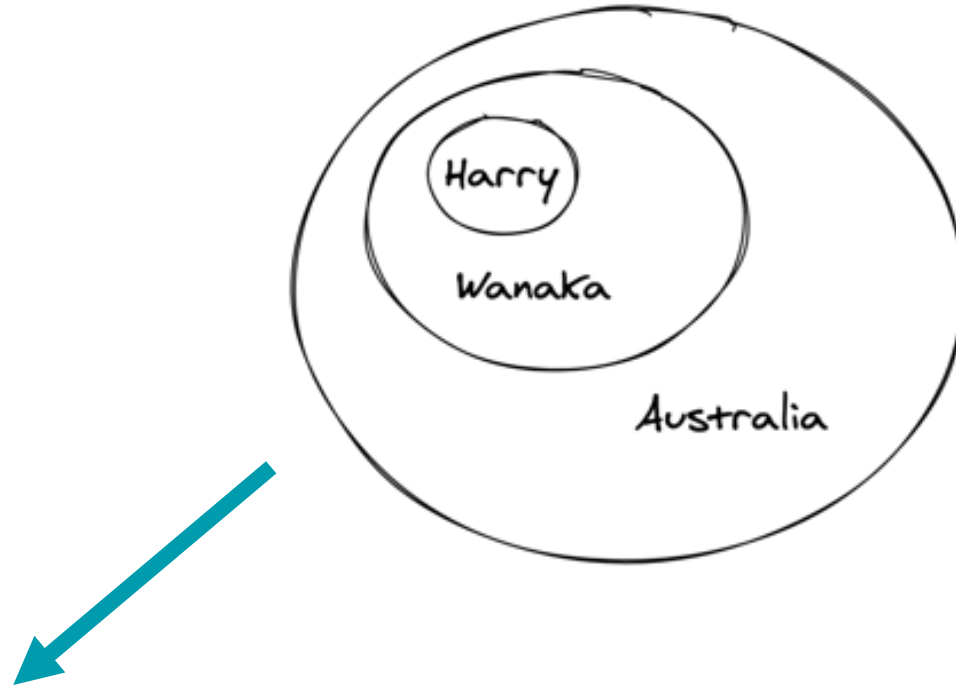
## Example: Soundness

Harry was born in Wanaka

Wanaka is in Australia.

Therefore

Harry was born in Australia.



Valid

## Example: Soundness

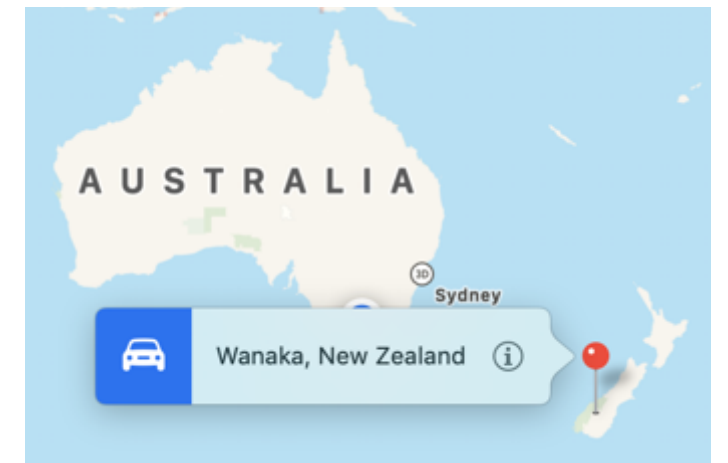
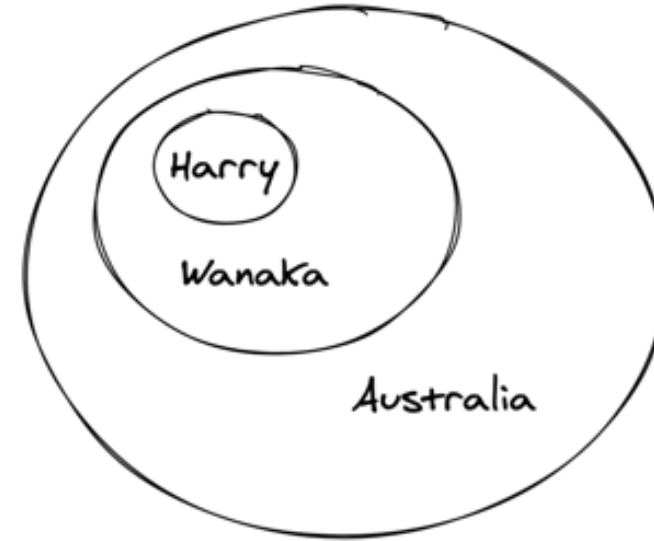
Harry was born in Wanaka

Wanaka is in Australia.

Therefore

Harry was born in Australia.

Unsound





## FIRST DATE WITH A LOGICIAN

These Venn Diagrams will save us a lot of time. We'll see where you fit in, where I fit in, and if any of it overlaps.



"Now, I'll give you one example: The change to fuel excise, the people that actually pay the most are higher income people, with an increase in fuel excise and yet, the Labor Party and the Greens are opposing it. They say you've got to have wealthier people or middle-income people pay more. Well, change to the fuel excise does exactly that. The poorest people either don't have cars or actually don't drive very far in many cases. But, they are opposing what is meant to be, according to the Treasury, a progressive tax."

The following day, Mr Hockey issued a media release explaining his comments. He said his statement relied on data from the Australian Bureau of Statistics, which showed that the 20 per cent of households with the highest incomes pay over three times more in fuel tax than the 20 per cent of households with the lowest incomes.

"The Australian Bureau of Statistics data is not something that I've concocted, it is the reality. These are dealing with the facts," Mr Hockey said.

"The fact of the matter is that I can only get the facts out there and explain the facts, how people interpret them is up to them."

The fuel excise is a progressive tax.

The people that actually pay the most are higher income people.

The poorest people either don't have cars or actually don't drive very far in many cases.

Data from the Australian Bureau of Statistics, which showed that the 20 per cent of households with the highest incomes pay over three times more in fuel tax than the 20 per cent of households with the lowest incomes.

The Australian Bureau of Statistics data is not something that I've concocted, it is the reality.

The fuel excise is a progressive tax.

The people that actually pay the most are higher income people.

The fuel excise is a regressive tax.

A progressive tax is one where the tax rate increases with the persons ability to pay.

The fuel excise tax takes a larger proportion of the income of low income people.

# Quiz

Validity and Soundness

**Questions?**

## 6. Evaluating Arguments





1. Identify the explicit structure
2. Consider the underlying structure and important unstated claims
3. Distinguish between independent lines of reasoning (and note important dependencies)
4. Check the validity of the lines of reasoning
5. Check the reliability of the sources and basic premises
6. Consider objections and rebuttals
7. Determine if the argument is successful or not



# Practice Exercises: Reasoning Structure

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- Reasoning and rigour
- Challenges of evaluation
- The parts of argument
- Surface-level vs underlying reasoning
- Validity and soundness
- Complications with language
- The evaluation process
- The Reasoning Stress Test approach

- Next seminar: Analysing argument structure
- Homework: Start writing an open-source report we can come back to later in the course (due Week 3)

# Exercise: Open Source Assessment

Homework exercise

## Demonstration: Lie detection





## ADVANCED ANALYTIC RIGOUR

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