

*“Arguments are to people as what lampposts are to drunks:  
they are used for support rather than illumination”*

*- Unknown*

# Arguments

## Critical Thinking

# Arguments for Winning

- When people think of an argument, they usually think of a heated debate, almost a fight (‘they’re having an argument’).
- That we see argument as fights is unfortunate:
  - Fights are between two people, rather than between their ideas or beliefs. Indeed, on this view, the goal of an argument becomes ... winning! (“She won the argument”, “He was better in the debate”)

# Arguments for Persuasion

- Similarly, people often use arguments to persuade other people to believe or do something.
- So again, the focus is on the person, not the idea.

# Arguments for Truth-Finding

- In this course, we look at arguments as a means by which we try and discover truth.
- In critical thinking, a good argument is one that helps us discover truth; it is not necessarily one that is persuasive or that makes our opponents shut up!

# Premises and Conclusion

- An argument has any number of supporting claims, and 1 supported claim.
- The supporting claims are the *premises* of the argument.
- The supported claim is the *conclusion*.
- Example: ‘We shouldn’t get pepperoni on the pizza, because pepperoni makes me sick.’
  - 1 premise: ‘Pepperoni makes me sick’
  - conclusion: ‘We shouldn’t get pepperoni on the pizza’

# Identifying Arguments in Real Life

# Arguments vs Expressions of Arguments

- In real life you'll find *expressions of arguments*:
  - they can be written, spoken, or communicated otherwise
  - they can be stated in English, or any other language
- This is not the same as the *argument* itself
  - The argument is abstract: the same argument could have been expressed in many different ways (see above, but also think of how statements can be reorganized)
  - Individual statements can be stated in different ways
  - Sometimes, whole premises, or even the conclusion, aren't even stated at all!
    - These are called hidden premises (or hidden conclusion)

# Getting Clear on the Argument

- As critical thinkers, we need to focus on the argument, not the expression thereof.
- We may need to paraphrase, elaborate, specify, reorganize, add hidden premises or other statements, remove superfluous ones, etc etc.
- Anything that will lay out the argument in a clean and clear fashion, ready for evaluation.



# Getting Clear on the Issue

- It is important to get clear exactly what issue you are addressing; exactly what question you are trying to answer; exactly what claim you are debating.
- A lot of time can be wasted when people are talking past each other.
- Example: Abortion is wrong
  - Always? Sometimes? In what respects?

# Premise and Conclusion Indicators

- Premise Indicators
  - ‘since’, ‘because’, ‘for’, ‘given that’, etc.
- Conclusion Indicators
  - ‘therefore’, ‘in conclusion’, ‘it follows that’, ‘hence’, ‘thus’, etc.
- Note: these indicators are *not* part of the premise or conclusion
  - They merely signal them!

# Arguments and Explanations

- Arguments are different from explanations.
  - I believe in God because that's how I was raised
  - This is an explanation: it explains why it is true (or how it has come to be) that you believe in God. But it provides no reasons to believe that the claim “God exists” is true
- Similarly, explanations are not justifications
  - The 9/11 hijackers did what they did because of what the U.S. had done in their home countries.

# Arguments and Explanations II

Argument:

That which we use  
to argue for something:  
reasons, facts,  
evidence, etc

True

Premises

Conclusion

Controversial

In both cases, we  
have a (supposedly)  
logical connection:  
The bottom part follows  
from the top part

That which we  
argue for

Explanation:

Our proposed  
explanation:  
hypothesis, theory

Controversial

Explanans

Explanandum

That which we  
try to explain

True

# Prudent Reasons

- “I believe in God because I need to believe in something.” (argument or explanation?)
- “I believe in God because if I don’t, and God does exist, there’ll be hell to pay.”
- These may be prudent reasons to go ahead and adopt or accept a certain belief, but they do not support the claim “God exists”.
  - Accepting claims on the basis of what others are saying can likewise be a prudent reason to believe that something is true, but they are not valid reasons for why any of those claims would be true.

# What makes a Good Argument?

## Properties of Arguments

# Valid Reasoning

- While in every piece of reasoning something is *believed to* follow from something else, this may in fact not be so.
- Example: “If I win the lottery, then I’m happy. However, I did not win the lottery. Therefore, I am not happy.”
- A piece of reasoning in which Y is believed to follow from X is *valid* if Y does *indeed* follow from X. Otherwise, the reasoning is said to be *invalid*.

# Well-Founded Reasoning

- Not all valid reasoning is good reasoning.
- Example: “If I win the lottery, then I’ll be poor. So, since I did win the lottery, I am poor.”
- This piece of reasoning is valid, but not very good, since part of what it assumed is false (‘If I win the lottery, I’ll be poor.’ Huh??) (also, I did *not* win the lottery ☹ )
- A piece of reasoning where  $Y$  is believed to follow from  $X$  is *well-founded* if  $X$  is true.



# Sound Arguments

- An argument is *sound* if it is both valid and well-founded:
  - Valid: The premises *support* the conclusion
    - Or: the conclusion *follows from* the premises
    - Or: *If* the premises are true, *then* the conclusion will be true as well
  - Well-Founded: The premises are *true*

# Sound Arguments and Good Arguments

- All sound arguments have a true conclusion.
- So, a sound argument does what we want a good argument to do (establish that something is true)
- So, for now, let us define a good argument as a sound argument (we'll actually change this later)

# Argument Diagrams

# Independent Premises

- Premises are independent if the falsity of one would not cancel the support the others provide for the conclusion
- Example:
  - [premise] “cheating on exams will hurt your character and, besides, [premise] it will throw off the grading curve. So [conclusion] don’t cheat on exams.”
- There are two separate reasons, or two ‘lines’ of reasoning here.
  - So, if one reason turns out to be false, you are still left with another reason.

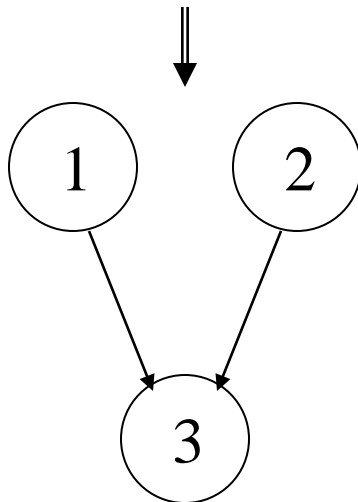
# Dependent Premises

- Premises are dependent if the falsity of one would cancel the support the others provide for the conclusion
- Example:
  - [premise] “cheating on exams will hurt your character and [premise] good character is very important. So [conclusion] don’t cheat on exams.”
- While there are 2 premises, there is only 1 ‘line’ of reasoning here.
  - So, if one of the premises turns out to be mistaken, the whole argument is worthless.

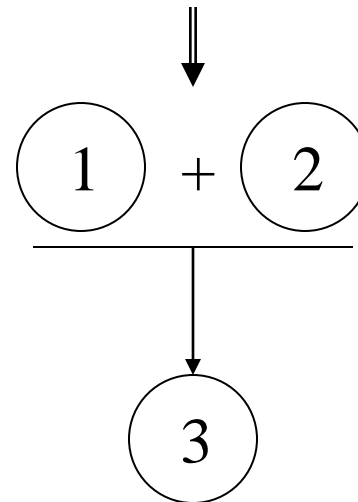
# Argument Diagrams

Argument diagrams can show dependency of premises:

(1) “cheating on exams will hurt your character and, besides, (2) it will throw off the grading curve. So (3) don’t cheat on exams.”



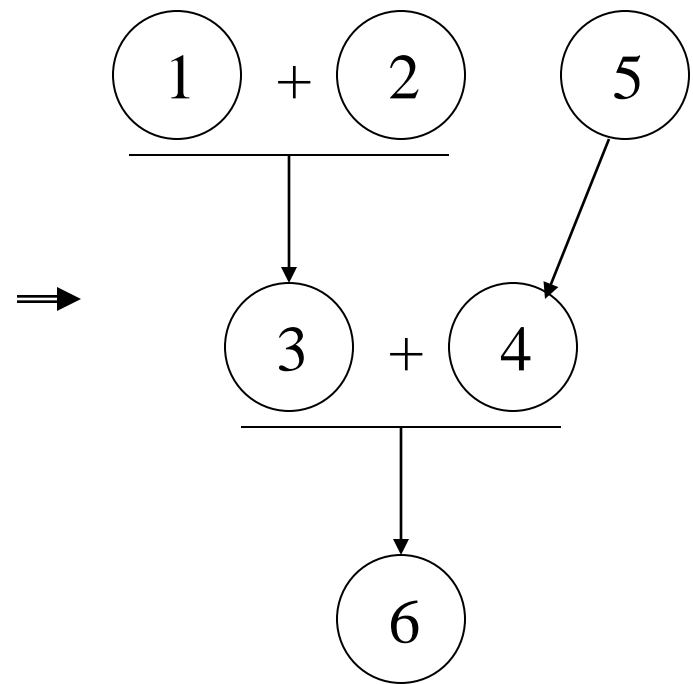
(1) “cheating on exams will hurt your character and (2) good character is very important. So (3) don’t cheat on exams.”



# Argument Diagrams II

Argument diagrams can also show intermediate conclusions:

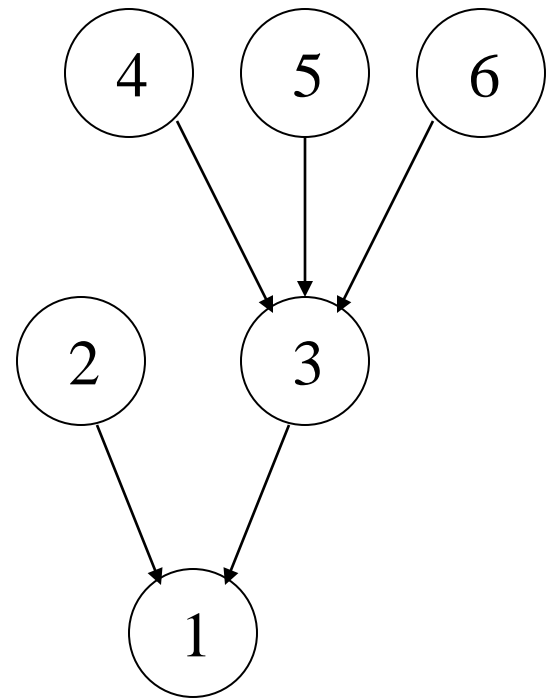
(1) The past does not exist, and (2) neither does the future. Hence, (3) only the present exists. However, (4) during the present there can be no lapse of time, since (5) the present is always instantaneous. Therefore, (6) time does not exist.



*-David Hume*

# Argument Diagrams III

I don't (1) hate cheerleading just because (2) it's about as safe as porcupine-juggling. I also hate it because (3) it's dumb. (4) The Velcroed-on smiles. (5) The bizarre arm movements stolen from the Navy signalmen's handbook. (6) The same cheers done by every troupe in every state.



- Letter to the Editor



# Evaluating Arguments

# Soundness of Arguments and Truth of Conclusions

- Again: All sound argument have a true conclusion.
- Ergo: Any argument with a false conclusion is unsound (i.e. either invalid or not well-founded)
- But: Not all arguments with a true conclusion are sound!
  - Example: “God exists. Therefore, snow is white”
- ***Moral: Just because the conclusion of an argument is true doesn't mean it's a good argument!!***

# Refuting Arguments

- We just saw that we shouldn't praise an argument just because it has a true conclusion.
- Likewise, while a false conclusion indicates *that* there is something wrong with the argument (or at least, that it cannot be sound), it still doesn't tell us *what* is wrong with the argument.
- ***Moral: Just because you can refute the conclusion of an argument doesn't mean that you have refuted the argument itself!***

# Elaboration on this Last Moral

- First, a concrete example: [Zeno's Paradox]
- Second: Suppose person X has an argument that concludes that God exists. But person Y says: "Your argument is wrong, because God does not exist. In fact here is an argument that concludes that God does not exist!". Well, from the standpoint of a third person Z, there are now 2 arguments, but with opposite conclusions (indeed, person X could just as well say that his argument shows that Y's argument is wrong!). The only way to make progress (i.e get closer to the truth) is to show *what* is wrong with one (or both) of the arguments!

# Refuting Arguments and Refuting Conclusion

- We just saw that refuting the conclusion of some argument does not constitute a refutation of that argument.
- However, the reverse holds as well: a successful refutation of an argument does not constitute a refutation of its conclusion.
- Example: “Snow is white. Therefore, God exists”
  - Invalid argument, so bad argument. But we can’t say: Aha, and therefore God does *not* exist!
- ***Moral: refuting an argument, and refuting the conclusion of that argument are two completely different things!***