

PHI 1101 [N] Reasoning and Critical Thinking, Winter 2018, John Atytalla

What is reasoning?

- The capacity to understand, evaluate and produce ARGUMENTS
- An argument is not just a dispute or a desire to prove that you are right
- “Argument” describe a group or set of statements in which one or more of those statements called **PREMISES** support, justify, or make it reasonable to believe that another one of these statements called the **CONCLUSION** is true.
- An argument is a set of statements which are connected by logic rather than rhetoric which is the scaffold by which the potential truth of certain statements (conclusions) can be derived from other statements (premises).

Logic vs. Rhetoric

- Rhetoric: is the art of convincing or persuading someone of some claim or another *regardless of whether the claim is true or whether the person believes it to be true*

Evaluating arguments: two ways...

1. To question the quality of their reasoning from premises to conclusion
 2. To question the truth of their premises
- Questioning the *quality of inferences* is questioning the **validity** of the argument
 - An argument is valid **IF the premises WERE true** the conclusion would be guaranteed also to be true
 - Questioning the *truth of premises* is questioning the **soundness** of the argument
 - A sound argument is one in which the premises **ARE TRUE** and the argument as a whole is *valid*

Arguments

What is an argument?

- to describe a group or set of statements in which one or more of those statements called PREMISES support, justify, or make it reasonable to believe that another one of these statements called the CONCLUSION is true.
 - Premises: supporting statements
 - Conclusion: what is supported by these statements
- The two parts of an argument (premises & conclusions) are connected by an INFERENCE: “an act in which the conclusion is derived (or drawn or inferred) from the premises”

- Arguments ARE NOT an“attempts to persuade someone that some claim or other is true”
- Thus arguments describe attempts and inferring conclusions from premises regardless of whether that attempt is successful according to the laws of logic.

Good vs. Bad Arguments:

- Two ways in which arguments can be evaluated:
 1. VALIDITY of the argument: This is then assessing the quality of the inferences made.
 - “An argument is said to be valid if it would be impossible for its conclusion to be false if all of its premises were true.”
 2. SOUNDNESS of the argument: This is then assessing the truth of the premises from which the conclusion is inferred.
 - A sound argument is one in which the premises ARE TRUE and the argument as a whole is valid
 - So ALL sound arguments are valid but NOT ALL valid arguments are sound

Not All Words or Ideas are Arguments:

- Contradiction: When a statement is false by definition or false because it makes one claim that denies the truth of the other.

Propositions vs. Other Expressions:

- The sorts of sentences which are relevant to logic are called PROPOSITIONS: Sentences that have the ability to be true or false.

How to Identify Arguments:

Premise indicators	Conclusion indicators
as	as a consequence
as shown by	as a result
as we can see from	for these reasons
because	hence
considering that	it follows that
for	it must be that
insofar as	so
on account of	therefore
since	thus
	we may conclude/infer
	which proves/shows that

Explanations and Arguments:

- EXPLANATIONS: Giving reasons for something that is already taken for granted as true.
- ARGUMENTS: Giving reasons in order to demonstrate that something is true
- Some arguments can be converted into explanations and vice versa.
 - This depends on what we take for granted as true as well as the “tense” or temporal sequence specified by the sentence.

Simple and Complex Arguments:

- Simple Arguments: When arguments only involve one inference.
- Complex Arguments: Involve more than one inference, where one or more conclusion serves as a premise in another argument (these are called Intermediate Conclusions)

Real Life is Messy: common speech is messy and this can make it hard to figure out what arguments is intended by a speaker. It also uses this to emphasis that RHETORICAL DEVICES (speech designed merely to convince rather than to rationally support a conclusion) often obscure the argument.

The Principle of Charity:

- It can be difficult to interpret an argument made in natural language and this includes the fact that we can interpret what people say in a number of ways.
- Ask yourself this: “What are the best reasons I could give to hold that opinion” & “Under what circumstances might I think it reasonable to believe what they do”

Principle of Forms of Inference: They are a way if deriving conclusions from premises but t is not always clear how the conclusion was derived.

- Usually guided by general principles or patterns of inference.
- Ex: Unreliable pattern of inference: X is a Y \rightarrow So X is a Z
- Ex: Reliable pattern of inference: X is a Y, ALL Y are a Z \rightarrow So X is a Z

Diagramming Arguments:

- Independent premises: premises can work on their own to come to the conclusion
- Dependent premises: all premises need to be true at the same time for the conclusion to come out
- Diagramming Complex Arguments: see example on p. 22-23

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Fallacies: A fallacy is a pattern of reasoning that should not convince anyone but which many people nevertheless find convincing. They are pattern of inference which are by definition erroneous

1. Often described as “red herrings” deliberate diversion of attention with the intention of trying to abandon the original **argument**.
2. Slippery Slope Fallacy: “if A happens, so will B, and then C, D... and finally Z, where Z is usually decreasing in probability from one event to another.

3. Non Sequitur: “it does not follow”, the conclusion is either true or false, but the argument nonetheless asserts the conclusion to be true and is thus **fallacious**.
4. Post Hoc: “**after** this, therefore because of this”, is a logical **fallacy** that states “Since event Y followed event X, event Y must have been caused by event X.”... does not mean that one event caused the other even, it is not logically connected.
5. Bandwagon: is a **fallacy** based on the assumption that the opinion of the majority is always valid: that is, everyone believes it, so you should too.
 - Truth is indifferent to popular opinions
 - Used to subjugate people
6. Ad Hominem: is an argumentative strategy whereby an **argument** is rebutted by attacking the character, motive, or other attribute of the person making the **argument**, or persons associated with the **argument**, rather than attacking the substance of the argument itself.
7. False Authority: Using an **authority** as evidence in your argument when the **authority** is not really an **authority** on the facts relevant to the argument.
8. Hasty Generalization: informal **fallacy** of faulty **generalization** by reaching an inductive **generalization** based on insufficient evidence—essentially making a rushed conclusion without considering all of the variables.
9. Tu quoque: one attempts to discredit an opponent's position by showing that the person making the argument has been unable to act in accordance with the position being argued for.
10. Appeal to force: When **force**, or even a threat of **force** is used in place of a reason in an attempt to justify a conclusion.
11. Appeal to ignorance: The assumption of a conclusion or fact based primarily on lack of evidence to the contrary. Usually best described by, “absence of evidence is not evidence of absence.” *X is true because you cannot prove that X is false.*
12. False Dichotomy: black-and-white thinking
13. Begging the Questions: **meaning** assuming the initial point), is a logical **fallacy** in which the writer or speaker assumes the statement under examination to be true. In other words, **begging the question** involves using a premise to support itself.
14. Equivocation: occurs when a key term or phrase in an argument is used in an ambiguous way, with one **meaning** in one portion of the argument and then another **meaning** in another portion of the argument
15. Straw Man: occurs when someone argues that a person holds a view that is actually not what the other person believes.
16. Argumentum ad nauseam: Repeating an argument or a premise over and over again in place of better supporting evidence.

Evaluating Arguments

Good Reasoning vs. Good Premises:

- The questions of good premises vs. good reasoning are independent since there are arguments with:
 - Good premises and good reasoning
 - Good premises and bad reasoning
 - Bad premises and good reasoning
 - Bad premises and bad reasoning

Evaluating Premises:

In some sense this section is really an introduction to another topic called epistemology or “theory of knowledge”.

- Epistemology studies how it is we come to know things and, in particular, under what circumstances would it be reasonable to accept some claim or other as an instance of knowledge.
 - In some sense it can then be understood as studying the conditions under which claims to knowledge can be justified.
 - Reasoning is then the study of the patterns of inference that are used in deriving certain propositions from others.
 - Epistemology would then be concerned with how we might determine the truth of premises that we start with
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- We usually set out sights not on certain truth, but on *rational acceptability*, asking ourselves: is it reasonable to accept this claim, even if we are not entirely sure that it is true?
 - We can also distinguish *degrees of acceptance of premises*.

Scope of Claim:

- The scope of a claim regards the number of objects to which it applies
- Particular claims: “one or more objects of a certain kind have a certain property”
- General claims are made “about a more substantial number of objects or individuals of a certain kind”
 - These may be vague or precise

Universal Claims:

- Universal generalization is a claim made about all things of a certain kind.

- E.g. All mammals are warm-blooded
- There are also negative universal generalization.
 - E.g. No bird is a mammal.
- It's obvious that such negative claims are also universal generalizations which can be seen as saying something about all things of a certain kind
 - E.g. No-birds are mammals implies that all birds are non- mammals
- It's hard to prove the truth of some universal generalizations
- (though not all)
- It's easy to prove the falsity of a universal generalization
 - Eg. All Crows are Black would be very hard to prove (as you would have to see each and every crow) whereas it's easy to falsify (requires you observe one crow which isn't black.
- On the other hand Particular claims cannot be refuted by counter-example.
 - Citing one example of a male prime minister does not show the particular claim "there has been a female British prime minister" to be false.
 - Though citing one female prime minister would falsify the general statement "all British prime ministers have been mal.

Analytic vs. Synthetic Propositions:

- Analytic propositions are propositions who are true by virtue of the meaning of their terms alone.
 - E.g. All bachelors are unmarried, All triangles have three sides
- Synthetic propositions are those whose truth or falsity is not determined by the meaning of the terms alone.
 - E.g. Every asteroid in our galaxy contains some ir
- Universal generalizations which are analytic are easy to prove but those which are synthetic are not so easy.

Sources of information:

- Things to consider:
 - Is the source reliable?
 - Has it ever steered you or others wrong before?
 - Is the source competent and in a position to know the relevant facts?
 - Is there any reason to expect the source to be biased? Is there a conflict of interest, for example?
 - Do other independent and reliable sources agree? How many?
 - Do any reliable sources disagree? How many?

Unreliability doesn't always mean bad intentions:

- Incompetence, ignorance and false confidence allows many ideas to spread widely despite their not being rationally grounded.
- *Ad populum* fallacy is important here just because many people believe something it doesn't mean it's true. This is more obvious in our times where any opinion can be expressed by way of modern communication technologies
- Bias and fraud are other, more obvious reasons that a source of information might lead us astray.

Experts and Authorities:

- Rules of thumb in assessing the claims of experts:
 1. There should be a genuine field of expertise. No one can be an expert in the fields of phrenology or orgone therapy, for example.
 2. The authority should be an expert in the relevant field. Someone who is a reliable source for matters in his or her field may well be a crackpot when speaking on other subjects.
 3. Get a second, third,...opinion. For there are many cases where experts in a field disagree.
 4. You may still decide to take the side of one party of experts even when there is no consensus on a particular topic. If you do this, however, you should at least try to explain how the other party may have come to hold what you consider to be a mistaken view.

Consistency and Inconsistency:

- A set of claims is inconsistent if it is impossible for all of them to be true together.
 - E.g. Jack is older than Jill. Jill is older than Jack.
 - We can recognize this as inconsistent even if we don't know which of these claims is either true or false. One of the two claims must be false though.
 - If we recognize a set of statements to be inconsistent we must then conclude that at least one of them must be false.
- People will sometimes say that inconsistent claims contradict one another. For our purposes contradictory statements are two statements where the former denies the truth of the latter.
 - E.g. I didn't eat the cookies. You did too!

Deductive and Non-Deductive Reasoning:

- Deductive reasoning is where the premises guarantee the truth of the conclusion.
 - When assessing deductive reasoning, we call good reasoning VALID
 - An argument is said to be valid if it would be impossible for its conclusion to be false if all its premises were true.
 - Deductive arguments have CERTAIN conclusions.

- Non-Deductive reasoning is then probabilistic. Good non-deductive reasoning will be reasoning which, does not guarantee the truth of the conclusion but nonetheless gives us good reason to regard it as likely to be true.
- Hence the earlier discussion of degrees of certainty. Deductive arguments have the highest degree of certainty whereas non-deductive arguments concern things that we can only know to be likely or probable.

Deductive Reasoning - Validity and Soundness:

- REMEMBER: VALIDITY AND SOUNDNESS ARE PROPERTIES OF DEDUCTIVE ARGUMENTS
- For ALL types of argument there are two questions to consider when evaluating them
 - Are the premises good?
 - Is the reasoning (the inference) good?
- Validity is a way of assessing the inference in deductive arguments
- Soundness assess both the reasoning as well as the quality of the premises
- Remember: all sound arguments are valid but not all valid arguments are sound
- This is because a sound argument is one that is valid with all true premises

Implications and Equivalence:

- When an argument is valid we also say that it's premises imply (or entail) its conclusion.
- A few important properties of implications:
 - Every proposition implies itself. (Implication is reflexive)
 - If proposition A implies B, it isn't necessarily the case that B implies A. For example, let A= Joe buys cigarettes legally, and B = Joe is over 18. (Implication is not symmetric).
 - In some cases A implies B and B implies A. For example, let A = Sam is older than Dave, and B = Dave is younger than Sam.
 - If A implies B and B implies C, then A implies C (Implication is transitive).
 - E.g. Let A = You slept through your alarm, B = So, you'll be late to class, C = So, you'll be late for the exam
- A few important properties if equivalence:
 - Every proposition is equivalent to itself (Logical equivalence is reflexive).
 - If A is equivalent to B, then B is equivalent to A (Logical equivalence is symmetric)
 - E.g. Let A = Sam is older than Dave, and B = Dave is younger than Sam.
 - E.g. Let A = The plants will die unless they're watered, and B = The only way that plants will live is if they are watered.
 - If A is equivalent to B, then B is equivalent to C, then A is equivalent to C (logical equivalence is transitive)

Evaluating Non-Deductive Reasoning:

- Are the premises acceptable?
 - Always asked about each premise separately.
- Are the premises relevant?
 - “A premise is said to be relevant to a given conclusion if it provides any support at all, no matter how much, to that conclusion”
 - Often asked about each premise separately.
- Are the premises adequate?
 - “A set of premises is said to be adequate if they provide enough support to make it reasonable to accept the conclusion”
- Concerns “the entire set of premises that are deemed both acceptable and relevant: we want to know if it is rational to accept the conclusion based upon all the evidence that has been presented and found worthy, not just some piece of it.
- In some sense adequacy replaces validity in non-deductive arguments as a measure
- “Is the reasoning (the inference) good?”
- “When asking about adequacy the best place to begin is with a careful consideration of the conclusion”
- How strong is it?
- What is its scope?
- “How well does the evidence provided by the premises matches the strength with which the conclusion is stated? A weaker conclusion obviously requires less support than a strong one”
- People often go too far (and less often not far enough) in putting forward a claim. I.e. they draw too strong a conclusion from the evidence provided by the premise