Recognizing, categorizing, and assessing arguments

Basic tools

Erik Hoversten

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The meanings of statements

- Statements are sentences that are put forward with **assertoric** force.
- Sentences can also be put forward as **questions**, **suppositions**, or **commands**.
- A propositions is the **content** of a sentence; the meaning to which different force can be applied.

Example

Sentence	Force	Content
"The door is ajar."	statement	*the door is ajar*
"Is the door ajar?"	question	*the door is ajar*
"I wonder if the door is ajar."	supposition	*the door is ajar*
"Shut the door!"	command	*the door is ajar*

Assertoric force is the linguistic force whereby one makes a claim about the world.

Arguments in general

Arguments are:

1. sets of propositions
2. where the premises stand in a relation of support to the conclusion, and
3. the conclusion is put forward with assertoric force

Not just anything is an argument

- It's not always obvious how to reconstruct an argument in our sense from a bit of prose that we may be presented with.
- Even if the writing is clear enough that we can identify the propositions each statement makes, not all sets of propositions constitute arguments.

Examples of non-arguments

No supporting premises

- Bald claims: New Jersey is better than New York in every way.
- Opinion: Anyone who can root for the Yankees has got a view of baseball that I can't understand.

No relation of support

- Report, exposition, illustration
- These provide a list of statements, but don't impose a structure on them.

Lack appropriate force

- Warnings: Whatever you do, don't go to the Golden Rail on gamedays.
- Advice: Before taking on a job during the semester, you should get a sense of your full course load.

Premise and conclusion indicators

Common premise indicators
- Since...
- Because of...
- In light of the fact that...
- It's well established that...

Common conclusion indicators
- Therefore... Thus... So...
- It follows that...
- One can conclude that...
- ∴

Recognizing deductive arguments

Common deduction indicators
- Necessarily...
- It follows directly...
- It must therefore be that...

Deductive argument types
- Definitions
- Categorical syllogism
- Hypothetical syllogism
- Disjunctive syllogism

Recognizing inductive arguments

Common induction indicators
- Probably...
- There's a good chance that...
- Most likely...

Inductive argument types
- Prediction
- Analogy
- Generalization
- Causal inference

Atomic propositions

- Atomic propositions are the basic building blocks of arguments.
- They are composed of a **subject** and a **predicate**.
- They are called **particular** if their subject is a specific individual.
- They are called **general** if their subject is a group of individuals or an unspecific individual.

Examples
- John is American. (particular)
- Mary went to the bank. (particular)
- Dogs have tails. (general - group)
- The first person on Mars will be very brave. (general - unspecific)
- Some swans are black. (general - group and unspecific)

Compound propositions

Negations...

- are composed of a negation word (not, no, un-) plus an atomic proposition.
- have the opposite truth value of the atomic proposition.
- *It is not the case that* the Moon is made of cheese.

Disjunctions...

- are composed of two atomic propositions connected by "or".
- are true just in case *either* of the atomic propositions are.
- John is stuck in traffic *or* he overslept.

Conjunctions...

- are composed of two propositions connected by "and".
- are true only if *both* of the atomic propositions are.
- Susan had the polenta *and* Willie had the eggplant.

Compound propositions

Conditionals

- Conditionals are composed of two atomic propositions connected by "if … then __".
- we call the first proposition the **antecedent**.
- we call the second proposition the **consequent**.

Sufficient condition

- The conditional says that whenever you have the antecedent, that is enough to get the consequent. This means that the *antecedent* is a **sufficient** condition for the consequent.

Necessary condition

- The conditional says that you can't have the antecedent without also having the consequent. This means that the *consequent* is a **necessary** condition of the antecedent.

Example arguments with conditionals

Modus ponens

1. If it rained last night, then the sidewalks are wet.
2. It rained last night. (*sufficient condition*)
3. ∴, the sidewalks are wet.

Modus tollens

1. If it rained last night, then the sidewalks are wet.
2. The sidewalks are **not** wet. (*necessary condition*)
3. ∴, it did **not** rain last night.

Deductive arguments

Validity (measures the *support* relation)

- Deductive arguments purport to give conclusive reason to believe the conclusion.
- If the argument is a good one, the conclusion follows directly from the premises.
- We say that a deductive argument is valid just in case **if the premises are all true, then the conclusion must be true.**

Soundness (measures the *truth* of the premises)

- But not all valid arguments have true premises.
- If a valid argument also has true premises, we say that it is **sound**.
- If we have a sound argument, we know for certain that the conclusion is true.

Example problematic deductive arguments

Invalid argument

1. All penguins are birds. (True)
2. Some birds fly. (True)
3. ∴, penguins fly. (False)

Valid but unsound argument (disjunctive syllogism)

1. Either Eli Manning is a running back or dolphins are fish. (False)
2. Dolphins are **not** fish. (True)
3. ∴, Eli Manning is a running back. (False)

Inductive arguments

Strength (measures the *support* relation)

▸ Inductive arguments purport to give reason to believe that the conclusion is probable.
▸ The better the argument is, the more probable the conclusion becomes.
▸ We say that an inductive argument is *strong* just in case **if the premises are all true, then the conclusion is very likely to be true.**

Cogency (measures the *truth* of the premises)

▸ But not all strong arguments have true premises.
▸ If a strong argument also has true premises, we say that it is **cogent**.
▸ If we have a cogent argument, we know that the conclusion very probably true.

Example problematic inductive arguments

Weak argument (does not provide a representative sample)

1. I know a lawyer who is a total liar. (True)
2. Bill is also a lawyer. (True)
3. ∴, Bill is probably a liar. (False)

Strong but not cogent argument (the study was inaccurately run)

1. 89% of male college basketball players are over 6 feet tall. (False)
2. Bill is a college basketball player. (True)
3. ∴, Bill is probably over 6 feet tall. (False)