

Handout

Arguments: the basics

An argument in logic is not a quarrel or dispute; instead, it is a list of sentences.¹ The last sentence is the conclusion, and the other sentences are the premises. Thus:

- (1) No professors are ignorant.
All ignorant people are vain.
No professors are vain.

and:

- (2) All lions are fierce.
Some lions do not drink coffee.
Some creatures that drink coffee are not fierce.

are both arguments. (These two examples are taken from Lewis Carroll, who was an amateur logician, as well as the author of *Alice in Wonderland*.) The readings will usually not contain arguments in this nice form. Rather, you will have to extract premises and conclusions from much more complex and lengthy passages of text. In doing this, it is helpful to look out for certain key words which often serve as indicators of (“flags” for) premises or conclusions.

Some common premise-indicators are **because, since, given that, for**. These words usually come right before a premise. Examples of the use of such “flags” for premises:

- (3) Danish pastries should be renamed, **because** the Danish cartoonists committed blasphemy.
(4) **Given that** euthanasia is a common medical practice, we might as well make it legal.
(5) **Since** marijuana is a dangerous recreational drug, it should not be prescribed by doctors.
(6) We must engage in affirmative action, **for** America is still a racist society.
(7) **Because** gay marriage is a hotly contested issue in this country, nobody should force his opinion about it on anyone else.

Some common conclusion-indicators are **thus, therefore, hence, it follows that, so, consequently**. These words usually come right before the conclusion of the argument.

¹ More exactly, sentences that are either true or false. Thus ‘Shut the door!’, and ‘Is the door shut?’, although perfectly acceptable sentences, cannot form part of an argument as explained here. !

Examples of the use of such “flags” for conclusions:

- (8) Either Clinton lied about sex, or about whether he was alone with Monica, or about the meaning of ‘alone’; **so** he lied about something.
- (9) Affirmative action violates the rights of white males to a fair shake; **hence** it is unjust.
- (10) It is always wrong to kill a human being, and a fetus is undoubtedly a human being. **It follows that** abortion is always wrong.
- (11) Sarah Palin is a woman of impeccable integrity and would never lie. **Consequently**, she has been wrongly accused.
- (12) Tony Soprano is seeing a psychiatrist and **so** is not playing with a full deck. **Thus**, he won’t make a good mob boss and should **therefore** be taken out.

It is also helpful to use these premise- and conclusion-indicators in your own writing, to make the structure of your arguments clearer. Don’t use them lightly, however: make sure they really are “flagging” either a premise or a conclusion of your argument, as appropriate. Anyone reading your paper is entitled to think that sentences preceded by **because**, etc., are premises, and that sentences preceded by **therefore**, etc., are conclusions. Make sure they are, or you are misleading the reader.

Evaluating arguments

Definitions:

A conclusion is entailed by (or is a logical consequence of) some premises just in case it is not possible for all the premises to be true and the conclusion false. Put another way, the conclusion is entailed by the premises just in case, necessarily, if the premises are all true, the conclusion is true.²

An argument is valid just in case its conclusion is entailed by its premises. (An argument that is not valid is invalid.)

Note that there are perfectly good arguments (in the sense that if you *were* to know that the premises are true, you *would* have good reason to believe that the conclusion is true) that are nonetheless invalid. For example:

- (13) Past Congresses have always contained many adulterers.
The current Congress contains some adulterers.
- (14) We have examined a large random sample of rats, and found that they can all solve sudoku puzzles.
Most rats can solve sudoku puzzles.

²At any rate, this will do for our purposes; if you want to read about some complications, see the Stanford Encyclopedia entry on Logical Consequence (<http://plato.stanford.edu/entries/logical-consequence/>). !

Such arguments are called inductively strong. (Deductive logic is the formal/mathematical theory of entailment or logical consequence; it is controversial whether there is a similarly formal/mathematical theory of inductive strength.) Although invalidity is not necessarily a sign of failure, the first thing you should ask yourself in evaluating an argument from the readings—or one of your own—is whether it is valid. Is it possible for the conclusion to be false and the premises true? Exercise: determine, for each of the two arguments from Lewis Carroll (i.e. (1) and (2)), and for each of the following arguments, whether it is valid or invalid. If the argument is invalid, explain why.

(15) Clinton’s troubles were caused either by a right-wing conspiracy, or by his own animal urges.

They were caused by his animal urges.

There was no right-wing conspiracy.

(16) If Britney Spears is a space alien, then I’ll eat my hat.

Britney Spears is a space alien.

I’ll eat my hat.

(17) All politicians enjoy cheating on their spouses.

Some male politicians enjoy cheating on their spouses.

(18) Abortion is morally wrong.

Abortion is not a constitutional right.

Abortion ought to be against the law.

Sometimes an argument which is invalid (and also not inductively strong) as written can easily be “fixed up” so that it is valid and in line with what the proponent of the argument intended. The most common reason for this kind of “corrigible” invalidity is missing premises. Sometimes a writer does not state all of his or her premises explicitly, and this renders his or her argument invalid. In such cases we can make the argument valid by supplying an appropriate premise, supposing that the writer intended it to be a premise all along. You should become adept at filling in missing premises so that you can see the structure of an argument more clearly. Exercise: supply the missing premises to arguments (17) and (18) above, and to the following arguments:

(19) If your failure to pay taxes is revealed, you’ll lose your reputation as a man of integrity.

Your nomination to head up Health and Human Services will collapse.

(20) Abortion involves terminating the existence of some organic matter.

Abortion is always morally wrong.

Note that sometimes a premise is left out because it is taken to be obvious, as in argument (17) above. However, sometimes the missing premise is contentious, as in (18) above. Sometimes, in fact, it is the most contentious premise of the argument, as in (20) above.

Definition:

A deductive argument is sound just in case it is valid and all its premises are true.

(An argument that is not sound is unsound.)

Argument (16) above is an example of a valid argument which is unsound.

Note the following fact, which is a consequence of the definitions of soundness and validity:

The conclusion of a sound argument is true.

This fact has practical import. It means that if you read an article and disagree with the conclusion, the onus is on you to show why the argument is unsound. For if it is sound, the conclusion is true. Therefore, if the conclusion is false, the argument must be unsound. This means that either the conclusion does not actually follow from the premises or at least one of the premises is false. In this subject, it is never enough simply to say that you disagree with someone's position, or that his or her position is mistaken. If it is mistaken, there must be something wrong with the argument, and you need to say what it is.

Soundness is thus a very important criterion in evaluating both arguments from the readings and your own arguments. After having identified the conclusion for which a writer is arguing, and the premises which he or she advances in support of that conclusion, you should attempt to determine whether the argument, thus reconstructed, is sound. If it is not sound, it may yet be inductively strong, with true premises. If it is neither, it may be committed to the flames.

Argument-forms and common flaws

Here are some examples of valid forms of argument.

Modus ponens. The general form of a modus ponens argument is given in (21). Two examples follow.

(21) If **P** then **Q**

P

Q

(22) If the NSA is listening to your phone conversations, then you are a terrorist.

The NSA is listening to your phone conversations.

You are a terrorist.

(23) If affirmative action is an effective way of achieving greater equality, then it ought to be practiced.

Affirmative action is an effective way of achieving greater equality.

Affirmative action ought to be practiced.

Modus tollens. The general form of a modus tollens argument is given in (24). Two

examples follow.

(24) If **P** then **Q**

Not-Q

Not-**P**

(25) If Obama solves the economic crisis in a year then he has supernatural powers.

He does not have supernatural powers.

Obama will not solve the economic crisis in a year.

(26) If abortion in the ninth month of pregnancy is acceptable, then infanticide is acceptable.

Infanticide is not acceptable.

Abortion in the ninth month of pregnancy is not acceptable.

Disjunctive syllogism. The general form of a disjunctive syllogism is given in (27a) and (27b). Two examples follow.

(27a) (Either) **P** or **Q**

Not-P

Q

(27b) (Either) **P** or **Q**

Not-Q

P

(28) Either Scooter is a liar, or else very forgetful.

Scooter is not a liar.

Scooter is very forgetful.

(29) Either Carrie spends all her money on shoes or Samantha does.

Samantha does not spend all her money on shoes.

Carrie does.

Categorical syllogism. Two general types of categorical syllogism are given in (30a) and (30b). Two examples follow.

(30a) All **F**s are **G**

x is (an) **F**

x is **G**

(30b) All **F**s are **G**

All **G**s are **H**

All **F**s are **H**

(31) All theories are unsupported hypotheses.

Evolution is a theory.

Evolution is an unsupported hypothesis.

(32) Abortion involves terminating the existence of organic matter.

It is always morally wrong to terminate the existence of organic matter.

Abortion is always morally wrong.

Arguments can have various kinds of flaws: for example, invalidity, false premises, dialectical ineffectiveness. NB: these are quite different, and should not be confused—false premises and failure to persuade an opponent are not *logical* flaws. Exercise: give an example of a dialectically ineffective argument (i.e. an argument that your imagined opponent will find unpersuasive) that is also sound.

Some of these flaws have common labels, as follows. The fallacy of equivocation: using key terms in different senses in different parts of the argument. Begging the question (also known as a circular argument): assuming what you are trying to prove. We will seldom see really obvious cases of begging the question in the readings. What we may see is a weak form of begging the question, namely putting forward as a premise something so close to the conclusion that no one would believe the premise who didn't already believe the conclusion. This is an ineffective mode of argument, precisely because it does not persuade. Proving too much: an argument is said to prove too much if it appeals to a principle which has consequences that the formulator of the argument would not accept, or which are clearly erroneous. Example: no politician should be taken seriously if he used to smoke pot. Ad hominem arguments: an ad hominem argument involves a personal attack on one's opponent rather than a reasoned objection to his or her position or argument. Appeals to authority: in philosophy, there are no authorities. It is never acceptable to support a position simply by pointing out that someone we've read holds it. Fodor is on the philosophy All-Star team, but that doesn't mean that nativism is true. Appealing to supposed authorities in this way is the mirror image of an ad hominem argument. Straw man arguments: representing your opponent's position or argument unfairly so that it is easier to shoot down. In such cases, all you have shot down is a "straw man", not your actual opponent.

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