Arguments Worksheet

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Philosophers and others use *arguments* to establish their claims. What are arguments? And what makes some arguments better than others?

Arguments

An *argument* is a list of claims all but the last of which are called "premises" and the last of which is called a "conclusion".

This is a technical definition. Obviously, we often use the word 'argument' much more loosely in everyday life.

Here are some examples:

1.
P1	The vast majority of scientist say that human activity is contributing to climate change.
P2	It is very unlikely that the vast majority of scientist are wrong on a point like this.
C	It is very likely that human activity is contributing to climate change.

2.
P1	My 4-year-old niece says that human activity is contributing to climate change.
P2	It is very unlikely that my 4-year-old niece is wrong on a point like this.
C	It is very likely that human activity is contributing to climate change.

These are all arguments. They are not, however, all *good* arguments. What makes an argument good?

3.
P1	Polar bears are white.
C	It is very likely that human activity is contributing to climate change.

Validity

An argument is *valid* if and only if it is impossible for all its premises to be true and its conclusion false.

Two things to note. First, validity is a matter of how the premises relate to the conclusion. The premises need *in fact* be true in order for the argument to be valid. Second, if an argument is invalid, we should be able to find a *counterexample:* a possible situation according to which all the premises are true but the conclusion is false. If you want to show that an argument is invalid, you should give a counterexample.

Here is an example of a valid argument:

1.

P1	Vaccines cause autism.	
P2	If vaccines cause autism, then we shouldn't vaccinate children.	
	———————————————	
C	We shouldn't vaccinate children.	

An argument is *invalid* if and only if it is not valid. Here is an example of an invalid argument:

1.

P1	All senators from Massachusetts are honest.
P2	Elizabeth Warren is honest.
	———————————————
C	Elizabeth Warren is a senator from Massachusetts.

Are the following arguments valid or invalid?

1.

P1	Alma and Betty have each taken Art and Biology courses and only Art and Biology courses.
P2	Alma's mean grade in Art is higher than Betty's mean grade in Art.
P3	Alma's mean grade in Biology is higher than Betty's mean grade in Biology.
	———————————————
C	Alma's *overall* mean grade is higher than Betty's.

2.

P1	Harvard is located in Massachusetts.
P2	Harvard is not located in Massachusetts.
	———————————————
C	Vaccines cause autism.

3.

P1	Harvard is located in Massachusetts.
	———————————————
C	If Princeton is in New Jersey and Rutgers is in New Jersey, then Princeton and Rutgers are both in New Jersey.

Soundness

An argument is *sound* if and only if it is valid and all its premises are true.

The conclusion of a sound argument *must* be true. Why? Because if the argument is sound, then it is valid. So it is impossible for all its premises to be true and its conclusion false. Furthermore, because the argument is sound, all its premises are in fact true, so its conclusion must be true too.

Exactly one of the two following arguments is sound:

1.

> **P1**   An *even* number of people voted in the 2012 U.S. Presidential election.
> _____
> **C**   An *even* number of people voted in the 2012 U.S. Presidential election.

2.

> **P1**   An *odd* number of people voted in the 2012 U.S. Presidential election.
> _____
> **C**   An *odd* number of people voted in the 2012 U.S. Presidential election.

Sound arguments are powerful. If we are disagreeing about some claim *C* — you think it is true, and I don't — then if you give me a valid argument for *C* I must either come to agree with you about *C* or challenge the truth of one of the premises of your argument.

Potential Convincingness

An argument is *potentially convincing for some person* if and only if, prior to being confronted with the argument, she or he believes its premises without yet believing its conclusion and is in a position to see that the argument is valid.

Although exactly one of the two arguments above is *sound*, neither argument could ever be *potentially convincing* for someone.

Why is that? Because if you believe the premise you thereby believe the conclusion. They are the same thing. So no one can be in a position of believing the arguments premise without yet believing the conclusion.