

is a case where the premises of the argument are true but the conclusion is not, making the argument invalid.

The point of all this is that inductive arguments—even good inductive arguments—are not (deductively) valid. They are not *watertight*. Unlikely though it might be, it is *possible* for their conclusion to be false, even when all of their premises are true. In this book, we will set aside (entirely) the question of what makes for a good inductive argument. Our interest is simply in sorting the (deductively) valid arguments from the invalid ones.

So: we are interested in whether or not a conclusion *follows from* some premises. Don't, though, say that the premises *infer* the conclusion. Entailment is a relation between premises and conclusions; inference is something we do. So if you want to mention inference when the conclusion follows from the premises, you could say that *one may infer* the conclusion from the premises.

Practice exercises

A. Which of the following arguments are valid? Which are invalid?

1. Socrates is a man.
 2. All men are carrots.
 ∴ Socrates is a carrot.

premise 1 (blue), premise 2 (green), carrots (orange)

VALID because Socrates is a man and all men are carrots

1. Abe Lincoln was either born in Illinois or he was once president.
 2. Abe Lincoln was never president.
 ∴ Abe Lincoln was born in Illinois.

VALID -- premise 1 gives two options, premise 2 eliminates one of the options and the conclusion is the other option

1. If I pull the trigger, Abe Lincoln will die.
 2. I do not pull the trigger.
 ∴ Abe Lincoln will not die.

INVALID -- Abe Lincoln dies of a heart attack & I do not pull the trigger

1. Abe Lincoln was either from France or from Luxemborg.
 2. Abe Lincoln was not from Luxemborg.

Premise 1 still true (but irrelevant); Premise 2 true

this is the counterexample

Conclusion: false because he died of heart attack

CHAPTER 2. THE SCOPE OF LOGIC

∴ Abe Lincoln was from France.

VALID -- premise 1 gives two options, premise 2 eliminates one option, leaving the conclusion option

1. If the world ends today, then I will not need to get up tomorrow morning.
 2. I will need to get up tomorrow morning.
- ∴ The world will not end today.

VALID -- premise 2 being true is easy to understand. Imagine if the conclusion was false. That would mean "The world will end today". BUT in that situation, Premise 1 says "I will not need to get up tomorrow morning." This contradicts premise 2.

INVALID
consider
counterex
Joe (Riesen)
is 19 y/o
and Joe
(Cuchta) is
87 y/o and
Bob is 10
years old.

1. Joe is now 19 years old.
 2. Joe is now 87 years old.
- ∴ Bob is now 20 years old.

B. Could there be:

1. A valid argument that has one false premise and one true premise?
2. A valid argument that has only false premises?
3. A valid argument with only false premises and a false conclusion?
4. An invalid argument that can be made valid by the addition of a new premise?
5. A valid argument that can be made invalid by the addition of a new premise?

In each case: if so, give an example; if not, explain why not.