

Instructions: Read the passage below. After you have read, please answer the questions about this reading that are on the 3rd page.



Evaluating arguments

Evaluating an argument involves establishing whether or not it is sound—that is, whether or not the conclusion follows from the premises and whether or not those premises are true.

A good argument

If an argument's conclusion follows from its premises (see pp.236–237), that argument is “good.” This is true whether or not the premises are true. So some—or all—of the premises of a good argument might be false. For example: “All women are immortal [premise 1]. Socrates is a woman [premise 2]. Socrates is immortal [conclusion].” Both premises here are false. However, the conclusion follows from the premises in that if the premises were true, the conclusion would also be true—so the argument itself is good. When a conclusion does not follow from the premises, the argument is “bad.”

premises are true or false. However, it is often difficult to know if a premise is true or false. This is why it is so important that arguments are good.

If a deductive argument is good and its conclusion turns out to be false, then we know that at least one of its premises must be false (see pp.242–43). A good deductive argument with a false conclusion can therefore be extremely useful in identifying one or more false premises. Inductive arguments are not quite so useful, as the conclusion might follow from true premises and still be false (see pp.244–45).

Philosophers are experts on whether or not arguments are good, but it is scientists who tend to be experts on whether or not the premises of an argument are true (see box). The ideal argument is good, and all of its premises are true. This is what we call a “sound” argument. All sound arguments are good, but not all good arguments are sound, because a good argument can still have false premises.

If a conclusion follows from a set of premises, then accepting that the premises are true gives us good reason to believe the conclusion. In a good deductive argument (see pp.242–243), we can be sure that if the premises are true, the conclusion is true. In a good inductive argument (see pp.244–245), if the premises are true, the conclusion is likely (though not, as with deductive arguments, certain) to be true.

A sound argument

Once we have established that an argument is good, the next stage is to question whether or not its

THE SCIENTIFIC METHOD

The scientific method uses good deductive arguments to determine whether a hypothesis (commonly reached by inductive argument) is false. For example, in 1859, the mathematician Urbain Le Verrier discovered that the conclusion of the good argument below is false:

Premise one: If Newton's Laws of Motion are correct, Mercury's orbit will be regular.

Premise two: Newton's Laws of Motion are correct.

Conclusion: Mercury's orbit is regular.

Le Verrier observed that Mercury's orbit is not regular (so the conclusion of this deductive argument is false). This meant at least one of the premises of this good argument must be false. So either we have misunderstood Newton's Laws of Motion (they do not imply that Mercury's orbit will be regular) or Newton's Laws of Motion are not correct. Einstein later proved that the mass of the Sun affects Mercury's orbit (and that Newton's Laws of Motion are not always and everywhere correct).

Valid is good

In a good argument, the conclusion (the assertion made) follows from the premises (the reasons given), regardless of whether the premises are true or false (see pp.240–241). A good deductive argument is called a “valid” argument. An argument is valid if and only if there is no logically possible situation in which its premises are true and its conclusion is false.

The notion of validity is often misunderstood. We may think, for example, that a deductive argument with false premises cannot be valid. But as long as we can work out (deduce) the argument's conclusion from the premises given—whether the premises are true or false—that argument is valid.

False but still valid

Just as a deductive argument with false premises can be valid, so can a deductive argument with a false conclusion. For example: “Tigers always have stripes [premise 1].

Domestic cats are little tigers [premise 2]. Domestic cats always have stripes [conclusion].” This is a valid (good) deductive argument because if the premises were true, the conclusion would also be true. But the conclusion isn't true, so the argument is not sound—at least one of its premises is false. (Even if premise 2 is metaphorically true, it isn't literally so.) In a sound argument, the premises must be true, and the conclusion must follow from those premises.

Validity and truth

If we know that the conclusion of a deductive argument is false but that the argument is valid, we can deduce that a premise must be false. So validity and truth are not the same thing. Validity preserves truth; it does not generate it. If the premises of a valid argument are true, then the conclusion of that argument is guaranteed by logic also to be true. This is an extremely useful property for an argument to have.

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QUESTIONS ON NEXT
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