

Hypothetical Syllogisms¹

Compound syllogisms are composed of different kinds of sentences in their premises and conclusions (not just categorical propositions, statements or sentences). Compound syllogisms are more familiar and are more often used than categorical syllogisms, and the rules of their uses are much easier to grasp. There are several kinds of compound syllogisms including hypothetical, disjunctive, conjunctive, dilemmas, and sorites. Today, hypothetical syllogisms (and a little symbolic logic as well).

I. Hypothetical Syllogisms

A. Definition

A hypothetical syllogism is built around a hypothetical statement which takes the form: "IF . . . THEN." Hypothetical syllogisms are not entirely hypothetical, but one of its premises is. Three hypothetical statements would not lead to any conclusion!

"IF . . . THEN."

"IF . . . THEN."

Therefore, "IF . . . THEN."

Rather, this kind of syllogism must be constructed of a conditional major premise, and an unconditional minor premise leading to an unconditional conclusion.

1. A conditional major premise.
2. An unconditional minor premise.
3. An unconditional conclusion.

Rather than having three terms as categorical syllogisms do, a hypothetical syllogism has only two terms. Instead of talking about subjects and predicates, here we will be talking about antecedents and consequents.

* The antecedent is the "IF" part of the statement. It states the condition under which the "THEN" part is true.

¹ NB: This material is taken from several logic texts authored by N. Geisler, H. Kahane, and others. I make no claim to originality in this material.

* The consequent is the "THEN" part, the consequence of or what follows from the antecedent if the "IF" part is true. All the minor premise has to do is say that the "IF" part "is" (modus ponens) or the "THEN" part "is not" (modus tollens). Either way, the conclusion is valid.

IF _____ (antecedent; first term) ... then _____ (consequent; second term).

B. MODUS PONENS: Affirming the Antecedent

1. Definition

The first way to get a valid conclusion from a hypothetical or conditional premise is to affirm the antecedent, which in Latin is called modus ponens (lit. way of affirmation). That is, the minor or second premise will assert that the antecedent or "if" is not just a speculation, but a reality. And if the "if" is true, then the "then" has to follow, and that becomes the conclusion. In symbolic logic (which simply uses symbols instead of words to indicate relations), the sideways horseshoe indicates and "if, ... then" relation.

If P, then Q	P... Q
P	P
Therefore, Q	Q

2. Examples of valid modus ponens syllogisms (see fallacies below):

1. If you can put an argument into symbolic logic that looks like this (P), then you have a modus ponens argument (Q).
 2. You can put an argument into symbolic logic that looks like this (P).
 3. Therefore, you have a modus ponens argument (Q)!
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1. If Jesus Christ arose from the dead (P), then he is the Son of God (Q).
 2. Jesus Christ arose from the dead (P).
 3. Therefore He is the Son of God (Q).
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1. If a contingent being exists (P), then a necessary being must exist as its cause (Q).
 2. A contingent being exists (P).
 3. Therefore, a necessary being must exist as its cause (Q).

1. If there is design in the universe (d), then there must have been a Designer (D)
2. There is design in the universe (d).
3. Therefore, there must have been a designer (D).

1. If I am Chinese, I am human.
2. I am Chinese.
3. Therefore, I am human.

C. MODUS TOLLENS: Denying the Consequent

1. Definition:

The other valid form of the hypothetical syllogism is to deny that the consequent is true. Modus ponens in Latin means "the way of affirmation," and, correspondingly, modus tollens in Latin means to "the way of negation" Hence, the hypothetical modus tollens syllogistic arguments are those which deny the consequent of a hypothetical statement, thereby negating the antecedent as well.

If there is a real connection between the antecedent and the consequent (the "if" and the "then,"), and the consequent is false, then the antecedent must be false also. Denying the consequent also involves the denial of the antecedent as well. So modus tollens is the reverse of modus ponens. If the antecedent were true, then so would the consequent (that's what modus ponens said!).

If P, then Q	P ... Q
Not Q	~ Q
Therefore, not P.	~ P

1. If anyone is born of God, then he loves his brothers.
2. Adolph does not love his brothers.
3. Therefore, Adolph is not born of God.

1. If the president acts forcefully, he will gain in the polls.
2. He is not gaining in the polls.
3. Therefore, the president is not acting forcefully.

1. If the national debt is paid off with inflated money, then borrowers will benefit and lenders will be harmed.
2. Borrowers are not benefited, and lenders are not harmed.
3. Therefore, the national debt is not being paid off with inflated money.

1. If a world government is established, wars will cease.
2. Wars are not ceasing.
3. Therefore, a world government is not being established.

1. If I have cash, I will loan you money.
2. I am not loaning you money.
3. Therefore, I do not have cash.

1. If I am Chinese, I am human.
2. I am not human.
3. Therefore, I am not Chinese.

II. Fallacies of the Hypothetical Syllogism

A valid hypothetical syllogism either denies the consequent (modus tollens-m.t.d.c.) or affirms the antecedent (modus ponens-m.p.a.a.) of the major premise; it does not deny the antecedent or affirm the consequent.

A. Denying the Antecedent:

That a particular condition is not fulfilled is not any proof that the consequent has not occurred since some other condition with which the consequent may be connected may be the cause of its fulfillment.

1. If abortion is murder, then it is wrong.
2. But abortion isn't murder.
3. Therefore, it is not wrong.

1. If Tom is late for work, then he will not attend the meeting.
2. Tom is not late for work.
3. Therefore, Tom will attend the meeting.

1. If I am Chinese, I am human.
2. I am not Chinese.
3. Therefore, I am not human.

1. If my name is Archibald, I am male.
2. My name is not Archibald.
3. Therefore, I am not male.

1. If Hawaii is ready for statehood, then Alaska is ready for statehood.
2. Hawaii is not ready for statehood.
3. Therefore, Alaska is not ready for statehood.

B. Affirming the Consequent:

The connection of a consequent with a condition (or antecedent) does not preclude the possibility that there are other conditions upon which the same consequent may follow. To affirm the consequent is no guarantee that the specified condition produced it. The fact that the consequent may have occurred is no proof or guarantee of that particular condition or antecedent.

1. If a member of the House of Commons is declared bankrupt, he loses his seat.

2. He has lost his seat.

3. Therefore, he is declared bankrupt.

1. If reincarnation is true, then past life regression therapy will work.

2. Past life regression therapy works.

3. Therefore, reincarnation is true.

1. If Reagan is still president, then a liar is in the White House.

2. A liar is in the White House.

3. Therefore, Reagan is president.

1. If I am Chinese, I am human.

2. I am human

3. Therefore, I am Chinese

1. If my name is Archibald, I am male.

2. I am male

3. Therefore, my name is Archibald.

1. If Hawaii is ready for statehood, then Alaska is ready for statehood.

2. Alaska is ready for statehood.

3. Therefore, Hawaii is ready for statehood.

Conclusion:

When you spot a conditional argument, you can test its validity very easily. First, make sure you know what the conditional or major premise is. Second, see whether the minor premise affirms or denies the antecedent or consequent in the major premise. If it affirms the antecedent or denies the consequent, a conclusion can be drawn and it is valid. Otherwise not.