

Argument Handout: Invalid Arguments

(D2) An argument is **valid** if and only if (iff) it is impossible for its premises to be true while its conclusion is false.

equivalently

(D2') An argument is **valid** (iff) if the argument's premises are true, then its conclusion is true.

From the definitions above we can see that a good way to show that an argument is invalid, is to come up with some possible story where the premises of the argument turn out to be true, but the conclusion turns out to be false.

Example One: Denying The Antecedent

1. If Julia ate an apple for lunch, then Julia ate a piece of fruit for lunch.
2. Julia didn't eat an apple for lunch.
3. Therefore, Julia did not eat a piece of fruit for lunch.

This argument is invalid. Consider the following possible scenario. Apples are fruits. So of course premise (1) is true. If Julia ate an apple, she ate a piece of fruit. However, suppose that Julia doesn't eat an apple for lunch, but eats a peach instead. Premise (2) is true, but our conclusion is false. She still ate a piece of fruit.

Example Two: Affirming The Consequent

1. If John rode in a Chevy to school, then John rode in an automobile to school
2. John rode in an automobile to school
3. Therefore, John rode in a Chevy to school.

This argument is invalid. Suppose John rode in a Ford to school. Premise (2) would be true. He rode in an automobile. Of course (1) is true. But the conclusion is false.

Denying The Antecedent (Invalid)

1. If P, then Q
2. not-P
3. Therefore, not-Q

Modus Tollens (Valid)

1. If P, then Q
2. not-Q
3. Therefore, not-P

Affirming The Consequent (Invalid)

4. If P, then Q
5. Q
6. Therefore, P

Modus Ponens (Valid)

1. If P, then Q
2. P
3. Therefore, Q