# Argument

## Definitions

* A logical process of argumentative by deriving a conclusion from certain premises.
* Premises + Conclusions = Argument
* Identify the argument
  + Find out the logical indicators
  + Find out the premises and conclusion
  + Formalize it

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# Not argument

## Report （报告）

### Definition:

* Facts or quotes from third party, without offer reasons

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| Report | Arguments |
| The ethicist argues that abortion should be legalized because the mother has the right to control over their own body. | Abortion should be legalized because the mother has the right to control over their own body. |

### Unsupported Statements of Belief or Opinion(无根据的信念)

* Without supporting reasons
* Wishful thinking, superstitions(迷信), subjective news(主觀看法), false statements
* Something that got no point of saying.
  + I think…. as start of sentence.

### Conditional Statement (條件, 或假設)

* If…then statement.
* Symbolized by p->q, where p is a hypothesis while q is conclusion.
* The conditional is defined to be true unless a true hypothesis leads to a false conclusion.
* Reference Link: https://www.mathgoodies.com/lessons/vol9/conditional#:~:text=Definition%3A%20A%20conditional%20statement%2C%20symbolized,leads%20to%20a%20false%20conclusion.

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| Conditional Statement (if p, then q) | Arguments  (if p, then q. if q, then r, so , if p then r) |
| If the curve is not flatten, then the community infection would become worse. | If the curve is not flattening, then the community infection would become worse. If the community infection would become worse, then the country will be locked down again. Therefore, if the curve is not flatten, then the country will be locked down again. |

### Illustration （述说一件事情）

* + make things clear
  + not to proof things right
  + examples provided must be observable

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| Illustration | Arguments |
| We should be an eco-friendly carnivore. Reducing our meat consumption, eating chicken rather than lamp or beef, etc. are the optional ways. | We should be an eco-friendly carnivore. High consumption of meat means high demand of livestock. High demand of livestock means high percentage of greenhouse emission. This will harm to our environment. |

### Explanation （解释）

* + To show why something is a case, not to prove it.
  + How to do and why is true
  + Cannot be argue
  + Conclusion is always correct.
    - Arguments: Reasons -> Claims (disputable)
    - Explanations: Reasons(disputable)->Claims

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| **Explanation** | **Argument** |
| **P1. CO2 emissions do harm.**  **P2. The earth’s temperature, ocean temperature and sea level is rising.**  **C: Therefore, global warming is real.** | **P1. We ought not to harm.**  **P2. CO2 emissions do harm.**  **C. Therefore, we ought to reduce CO2 emissions.** |

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# Language of Arguments

## Vagueness （模糊不清）

* + Fuzzy
    - Example:
      * I’ll be back later.
      * We should raise taxes on wealthy.
    - Advantages:
      * Suitable caution
      * Add richness, subtlety, complexity
      * Avoid revealing important information

## Over generality （过度普遍或者笼统，宽泛）

* + Too broad and unspecific enough in a given context
  + Not borderline cases
    - Example:
      * More than 20 years old.
* Comparison between Vagueness and Over-generality

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|  | Vagueness | Over-generality | Precise |
| How old are you? | So young! | More than 15 | 20 years old |
| How many students take this subject? | No less | Around 100 | 154 students |
| When will you complete the work? | Soon | By next week | On Monday |

## Ambiguity (模拟两可, 歧义)

* A word has two or more distinct meaning in the language.
* The context does not make clear which meaning is intended.
  + Example:
    - Bank
    - Japanese teacher
    - Light

### Type of ambiguity

* Semantic Ambiguity (语义歧义)：一个相同的字可能有不同意思
  + Uncertainty about the meaning
    - Example:
      * I will go to bank.
* Syntactical Ambiguity(语法问题)
  + Faulty grammar or word order
    - Example:
      * Mr Tan will give a lecture on money game in the classroom.
* Referential Ambiguity (指称歧义): 一个东西可能代表2到3个人造成不确定
  + Unclear on what a pronoun or object is referring to
    - Example:
      * John hit Mike with his phone. Then he died.

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# Deductive arguments

## Definition:

* + Conclusion logically necessary derived from the premises.
  + Premises must be true; conclusion could not possibly be false.
  + Denial of conclusion lead to contradiction.

## Example: (Blue for premises, red for conclusion.)

* + All humans are mortal. Socrates is human. Therefore, Socrates is mortal.
  + He is studying at Southern University College. So he must be a college student.
  + If you have scars on your body, then you have been abducted by space aliens. You obviously do have scars on your body. Therefore, you have been abducted by space aliens.

## Common patterns:

* + Categorical Syllogism
  + Hypothetical Syllogism
  + Disjunctive Syllogism
  + Argument based on mathematics
  + Argument from definition

### Categorical Syllogism

* + Begin word with all, some, no.
    - Example:
      * All humans are mortal.
      * Some humans are female.
      * No human is reptile.

### Hypothetical Syllogism

* Contain at least one hypothetical or conditional premise.
* If then, only if, unless, insofar as, etc.
* Example of antecedent and consequent:(blue for antecedent, red for consequent)
* If the match is burning, then there is oxygen in the room.

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| Affirming the antecedent | Denying the consequent |
| P1: If the match is burning, then there is oxygen in the room.  P2: It is burning.  C:Therefore, there is oxygen in the room. | P1: If the match is burning, then there is oxygen in the room.  P2: there is no oxygen in the room.  C:Therefore, the match is not burning. |
| P1: If it rains, then the floor is wet.  P2: It is raining.  C:So the floor is wet. | P1: If it rains, then the floor is wet.  P2: The floor is not wet.  C: It is not raining. |

* Chain argument
  + If A then B, if B then C, therefore, if A then C.
    - Example:
      * P1: If global warming becomes worse, then the temperature will raise.
      * P2: If temperature raises, then some animals will extinct.
      * C: Therefore, if global warming becomes worse, then some animals will extinct.

### Difference between Conditional Statement and Hypothetical Syllogism:

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| Conditional Statement | Hypothetical Syllogism |
| If p, then q.  Example:  If it rains, then the floor is wet. | If p, then q. Q. Therefore, p.  Example:  P1: If it rains, then the floor is wet.  P2: It rains.  C:Therefore the floor is wet. |

### Disjunctive Syllogism

* Logically rule out various possibilities until only a single possibility remains
* The options should exhaust all elements of the set.
* Either A or B, Not B. Therefore, A.
  + Example:
    - P1: Either Joe is in the campus or he is at home.
    - P2: Joe is not at home.
    - C: Therefore, Joe is in the campus.

### Argument Based on Mathematics.

* Proof with mathematical calculation.
* Boolean law, Euclid Geometry.
  + Example:
    - P1:8 is greater than 4.
    - P2: 4 is greater than 2.
    - C: Therefore, 8 is greater than 2.

### Argument Based on Definition

* Conclusion is true by definition
  + Example:
    - P1: Mike is a paediatrician.
    - C: Therefore, he is a doctor.

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# Inductive Arguments

## Definition

* Each conclusion is probably derived from the premises.
* Given the premises, the conclusion could possibly be false.
* If the premises logically possibly guarantee the true of conclusion, then it must be inductive.

## Common Patterns

* Inductive Generalization
* Predictive Argument
* Argument from Authority
* Causal Argument
* Statistical Argument
* Argument from Analogy

### Inductive Generalization

* Attributing some characteristic to all, most, or some member of a given set.
* Get conclusion from the set
  + P1: For any given set or group, A has characteristic X.
  + P2: B has characteristic X.
  + P3: C has characteristic X.
  + C: Therefore, the members of this group has characteristic X.
* Example:
  + P1: Alpha does not invest JJPTR
  + P2: Beta does not invest JJPTR
  + P3: Zeta does not invest JJPTR
  + C: Therefore, no students of SUC invest JJPTR.

### Predictive Argument

* About what may happen in the future
* Nothing in the future is absolutely certain.
* Examples:
  + P1: Every previous Prime Minister has been a man.
  + C: Therefore, it is likely that the next Prime Minister will be a man.
* Sometimes it can be deductive. (hypothetical syllogism)
  + P1: If Mr. Tan were not feeling well, then the class will be cancelled.
  + P2: Mr. Tan is not feeling well.
  + C: Therefore, the class will be cancelled.

### Argument from Authority

* Citing some presumed authority or witness who has said that the claim is true.
* P1: Person S stated that p.
* P2: S is a reliable source.
* C: Therefore, p is true.
  + Example:
    - P1: Whatever the Confucian Analects teaches is true.
    - P2: The Confucian Analects teaches that we should love our neighbors.
    - C: Therefore, we should love our neighbors

### Casual Argument

* Comprised of causal explanation
* Something causes, has caused, or will cause something else
* At most time, we can never fully certain the effected cause.
  + Example:
    - I cannot log on. The network must be down.
    - Rashid is not allergic to peanuts. I saw him eat a bag of peanuts this morning.
* Casual argument can be deductive. (hypothetical syllogism)
  + P1: Whenever iron is exposed to oxygen, it rusts.
  + P2: This iron pipe has been exposed to oxygen.
  + C: Therefore, it will rust.

### Statistical Argument

* Resting on statistical evidence
* Presented as probable rather than certain
  + Example:
    - P1: Eighty-five percent of SUC students are Johorians.
    - P2: Mike is SUC student.
    - C: So, Mike is probably a Johorian.
* Statistical argument can be deductive. (hypothetical syllogism)
  + P1: If Trump gets at least 270 electoral votes, then he will win the election.
  + P2: Trumps get 306 electoral votes.
  + C: Therefore, Trump wins the election.

### Argument from Analogy

* Comparison of two things
* To be alike in some relevant respect
* Analogy vs. Argument from analogy
  + Analogy simply point out a similarity
  + Argument from analogy claim that certain similarities are evidence that there is another similarity

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| Analogy | Argument from analogy |
| Our brain is like a muscle.  Capitalists are like vampires. | P1: Our muscle can be trained as fast and strong.  P2: Our brain is like a muscle.  C: Once you train it, it gets faster and stronger. |