

# Logical Reasoning in Academic Writing

Students often struggle to understand how **academic reasoning** differs from the reasoning processes they use in daily life. It is not the reasoning that differs so much as the requirement that all steps in the reasoning process be expressed in a written paper. In academic writing the author must assume a reader does not have access to the same background data.

- Is my reasoning following a defined process?
- What external sources help determine criteria for choices?
- Are my criteria situational or universal? How do I know?

We are not accustomed to expressing our reasoning processes. Often, we are unaware of these processes ourselves. Asking questions while writing helps clarify the steps taken in reaching a decision or opinion.

Questions to ponder:

- What is a “logical” argument?
- Is “reason” enough to justify an opinion? An action?
- Can a choice be reasonable and unethical?

## Claims

- **Claims** are *reasonable conclusions* based on **evidence**
- Your thesis and conclusions are claims
  - **Warning:** Logical reasoning by different people, in different or even similar contexts can lead to different claims.
- There are several models for how claims and evidence relate in an academic paper:
  - Experience ⇒ Reasoning ⇒ Claim
  - Claim ⇒ Reasoning ⇒ Evidence
- Examples of evidence, reasoning, and claims
  - Evidence: facts, examples, statistics, history, lab results
  - Reasoning: **induction, deduction, causation, relation** (*analogies*)

## Induction

- Induction is reaching a conclusion based on perceived patterns
  - **Warning:** Humans tend to search for patterns, even when patterns might not exist.
- Example inductive logic:
  - A, C, E... ?
  - Is the next in the series “G” logically?
- There are limits and risks to induction.
  - You need sufficient data
  - Most things are a **probability**, not a certainty
  - Decisions can be **cost/benefit**, actuarial (*risk-analysis*)
- Real life:
  - Marketing and business projections are induction
  - Insurance rates are induction

## Deduction

- Deduction is recognizing **definite facts**, relations, and connections until one explanation for a situation remains
- Example deductive logic:
  - $A=B, B=C, C\_A$  ?
  - Does  $C=A$  logically?
- Must have and present all facts to an audience
- Should be “reproducible” by others

## Causal

- Causal logic looks for “cause and effect” sequences that can be verified and replicated.
- A causes B, based on...
- Seldom a perfect relationship
  - Probability must be considered
  - Often other explanations can be suggested
- Causal claims are common in social sciences
  - Harder to test than lab work
  - “Hard science” starts with causal, uses deduction

- Risks using causal claims and reasoning:
  - Do not oversimplify
  - One cause (event/stimuli) might have many effects
  - An effect (result) might have many contributory causes
  - Some effects are dependent on a series of rare/unlikely events

## Analogies

- An analogy assumes that members of a group experience the same or similar phenomena.
- Example:
  - Most rich defendants are found not guilty of first degree murder
  - Therefore... O.J. Simpson was **likely** to be found not guilty
- Risks using analogous cases / examples:
  - The object, items, or cases might not be parallel examples
  - Analogies are based on probability, not certainty

## Fallacies

**Note:** You have an ethical responsibility to avoid misleading your audience.

- Ad hominem attacks: attacking the character of those (persons) with opposing views
  - Only a cold-heartless person could oppose universal healthcare!
- “Strawman” examples (or “strawperson” if you prefer): creating a weak and misleading example of your opponent’s view, then using logic to attack the simplified position you have created
  - If motorcycle helmets save lives, should we wear helmets while walking?
- Using absurdity (reductio as absurdum): extending an opposing argument beyond what is reasonable or actually intended by your opposition
  - If the minimum wage helps people, why not make it \$50 per hour?
- Accusing opponents of a “slippery slope” view: suggesting actions recommended by an opponent will lead to undesired results.
  - If we ban smoking in malls, how long before we ban smoking in private homes?
- Circular logic/reasoning: arguing in such a way that your points “require” each other to be true.
  - I believe Dr. Phil is a relationship expert. His books say he is an expert.

- Semantics: arguing over the meaning of words or phrases, instead of addressing the actual concerns of your audience.

**References:**

Schnelbach, S. D., & Wyatt, C. S. ( 18 April, 2020 ). Tameri Guide for Writers. Retrieved [date accessed], from <https://www.tameri.com>