Paper Feedback Presents:

Our Guide to Better Grades

Your entire university experience is centred on developing critical thinking skills. It's about utilising logical arguments in defence of a position that you take. Anyone can write a sentence, but writing a logical, and compelling argument is more difficult. A complaint most students have is that essays are an unfair way of assessing arts students' abilities. *"How can you formally mark something so subjectively? How is it fair to grade one person's view as a First, and another person's view as a 2:2?"*

The truth is essays are not assessed according to the student's views or opinions. Essays are assessed on the strength and coherence of the student's arguments. Behind every successful essay is a core of critical thinking and logic; all the expressive vocabulary and rhetorical sleight of hand that you have at your disposal mean nothing if your argument doesn't stand up. Academia, even in the arts, is still fundamentally about the application of logic and principles.

Fear not!

The following eBook was put together by our team of analysts from across the globe. It is designed to help you with dissecting your arguments and putting them back together. Within this eBook are the secrets that your university professors will never tell. They simply do not have the time to help every student learn these fundamentals of arguing. With the application of these specific frameworks for academic writing, your essays will flow more smoothly, your arguments will be more coherent, and best of all, your grades will be much better.

Please note that it is easy to read this eBook, and it might already know some or all of the advice contained here but to get the most out of your time at university, you will need to internalise the lessons learned in this guide. You cannot simply learn about how to argue better, you have to put these lessons into practice immediately. You should refer back to this eBook on a regular basis because the best way to grow academically is to revise your intellectual development through practice.

I'd Like To Have An Argument Please!

Professors grade hundreds of papers per semester. For the most part, this is really boring to them. So that they actually engage with what you are writing, your paper needs to be argumentative. It is too often the case that a student will simply describe what they have read in their own words, and not challenge what they have read, or take a position of their own. You want to pick a fight with your professor, or agree with their views. In either case, you need to have an argument. To have an argument you must think critically, that is to say, you need to question how you think because most of the time, people do not actually think critically.

Arguments + Critical Thinking = Better Grades

The fundamental concern of critical thinking is questioning the quality of your beliefs. That is not a judgement on your opinions; it is not about what you think, but about *how* you think. Pretty much everything is arguable, and there are always alternatives to what might seem like the obvious. It is a cliché but it's worth repeat that – generally speaking – there are no right or wrong answers. If there were, then nobody would have any opinions, politics and religion wouldn't exist, and conversations would be far less interesting. A belief is worth accepting if we have good reasons to accept it, and likewise, a belief is worth ignoring if we have good reasons to ignore it.

Critical thinking entails, therefore, the systematic evaluation or formulation of beliefs or statements according to rational standards. The evaluation of beliefs (for critically assessing existing ones) and the formulation of beliefs (for devising new ones) involve distinct procedures and methods, which determine how well beliefs are supported by reasons.

Let's put this in terms of logic, which is the study of the rules that govern good reasoning or inference.

Every argument you have in a paper is going to need to have within it the following core items:

a) the statement,
b) the argument/premises/conclusions,
c) the inferences,
d) the explanation,
e) disagreements, and the
f) indicator words

The Statement: an assertion that something is, or isn't, the case (i.e., somebody's belief).

- It is either true or false; for example, "my eyes are brown."
- Reasons provide support for a statement, and a statement backed by good reasons is worthy of acceptance.

The Argument: the assertion of reasons in support of a statement.

- Premises: statements given in support of another statement.
- Conclusion: the statement that the premises are intended to support.
- An argument is, therefore, the combination of premises which provide reasons for a conclusion.
- In extended argumentative passages, premises and conclusions make up only a small amount; most of it tends to be background information and restating the premises and conclusions.
- An example of an argument with two premises is: *smoking is bad for your health because it is known to cause lung cancer and cigarettes contain high levels of nicotine.*
    - Premise 1: it is known to cause lung cancer.
    - Premise 2: cigarettes contain high levels of nicotine.
    - Conclusion: smoking is bad for your health. This is the statement that the premises are intended to support.

The Inference: the process of reasoning from a premise or premises to a conclusion.

- A mere declaration of beliefs is *not* an argument!

The Explanation: tells is why something is the case.

- An explanation is not the same as an argument, although they are easily confused; an argument has something to prove, an explanation is a neutral presentation of facts.

The Disagreement: a rebuttal of an argument.

- A disagreement does not contain an argument; that is a counter-argument.

The Indicator Words: words that are used to indicate a premise or a conclusion.

- They are the signposts for an argument so that a reader can quickly understand what you are saying, and get the gist of your argument.

Signals of Conclusion	***Signals of Evidence***
therefore	because
thus	since
hence	for
so	
as a result	
clearly	

Critical thinking is the evaluation and formulation of statements according to this logical framework. Sometimes, you may not be able to assign any substantial weight at all to the reasons for or against a statement; there simply may not be enough evidence to rationally decide. A lack of critical thinking means that a person is not critically analysing (i.e. carefully and rationally judging) their own beliefs, and if somebody is not aware of their beliefs, then they are not guided by themselves but by beliefs which are out of their control. A lack of critical thinking means, therefore, a lack of personal freedom.

But what about emotions?

So far, our logical terms seem to treat arguments and statements in a rather non-human fashion; of course, we are not always logical, because our emotions often override rationality. Critical thinking and emotion complement each other; emotions can stimulate the desire to believe in a statement, but critical thinking is needed to assess and enhance these emotions.

The Truth About Falsehoods

Critical thinking doesn't just happen, though; several conditions must be present before successful critical thinking is possible. People are, by nature, fallible, and so there are thousands of ways in which our reasoning can fail. However, there are methods to detect errors in our thinking, restrain attitudes and emotions which can distort our thinking, and achieve a level of objectivity concerning our own beliefs.

To do this successfully requires three things; awareness, practice and motivation. We must be aware of not only what good critical thinking involves, but just as importantly, what sloppy thinking involves, as we can only break bad habits if we know about them. Avoiding the pitfalls of sloppy thinking and using the skills and techniques that good critical thinking takes practice and motivation.

The most common hindrances to critical thinking can be separated into two groups; hindrances because of *how* we think, and hindrances because of *what* we think. How we think is caused by psychological factors, and is affected by fears, attitudes, motivations and desires, while what we think is caused by certain philosophical ideas that we hold, and is affected by our beliefs about our beliefs.

When evaluating a claim, it is important to break away from thinking about one's own needs by watching out for when things get personal, being alert to ways in which objectivity and rational analysis become undermined, and ensuring that nothing has been left out. A basic principle of scientific work is to not accept a favoured theory until alternative, competing theories have been thoroughly examined, which should be the same approach to critical thinking.

It is also essential to avoid the effects of group pressure on your own critical thinking. Group pressure often comes in the form of peer pressure, and appeals to popularity and to common practice; democracy is a wonderful thing, but not when two irrational thinkers can drown out one critical thinker! Good critical thinking requires a degree of individuality in order to avoid group-centred thinking, which can degenerate into narrow-minded thinking, resistance to change, and stereotyping. The best way to defend yourself against this is to always set your acceptance of a claim proportionally, according to the strength of reasons.

However, none of us is immune to psychological obstacles, which constitute most products of egocentric (or individual-centred, as opposed to group-centred) thinking. We may accept a claim solely because it advances our interests or helps us to save face, but we need to be aware that strong emotions can warp our thinking.

A worldview is a philosophy of life, a set of fundamental ideas that helps us to make sense of a wide range of issues; we all have a worldview, and even the rejection of a worldview is a worldview. Some elements of worldviews can undermine critical thinking. Below are some terms for situations where flaws in our thinking affect our rationality:

Subjective Realism

- The idea that truth depends on what someone believes, but just because you believe that something is true, that doesn't make it true.
- When you do this in critical thinking, it is referred to as Subjectivist Fallacy.
- The biggest problem with this fallacy is that it is self-defeating, which is that its truth implies falsity; i.e., Subjective Realism undermines the argument that it is trying to support.

Social Relativism

- Some people posit that truth is relative to societies, but this is also self-defeating,

which again means that truth in one context is false in another.

Scepticism

- There are some who believe that we know much less that we think we do, or that we know nothing at all (this second, rather self-denying principle is known as Philosophical Skepticism).
- Knowledge requires certainty.
- Doubt is always possible, but it is not always reasonable.

Key Words: The Truth About Falsehoods

Appeal to common practice: the fallacy of accepting or rejecting a claim based solely on what groups of people generally do or how they behave.

Appeal to popularity: the fallacy of arguing that a claim must be true because a substantial number of people believe it

Peer pressure: group pressure to accept or reject a claim based on what one's peers think or do.

Philosophical scepticism: the view that we know much less that we think we do or nothing at all.

Philosophical sceptics: those who believe the view above.

Social relativism: the view that truth is relative to societies

Stereotyping: Drawing conclusions about people without sufficient reasons

Subjective relativism: the idea that truth depends on what someone believes.

Subjectivist fallacy: accepting the notion of subjective relativism

Making Sense Of Arguments

The point of devising an argument is to try to show that a statement or claim is worthy of acceptance. If you can do this, your professor will be impressed. Likewise, the point of evaluating an argument is to see whether that argument has been successful. A good argument is one worthy of acceptance; a bad argument is not. Arguments can be classed as either deductive or inductive, depending on the type of support they provide for their conclusion.

A deductive argument is intended to provide logically conclusive support for its conclusion; a deductive argument that succeeds in this is *valid*, because if the premises are true, then the conclusion must also be true (i.e., the logical structure guarantees the truth of the conclusion if the premises are true). An argument which fails to provide such support is *invalid*. However, bear in mind that validity is *not* a synonym for truth; an opinion can be substantiated by valid deductive arguments, but that does not make it true. Instead, deductively valid arguments are said to be truth-preserving. A deductively valid argument that has true premises - actually, genuinely true premises - is said to be *sound*. The kind of support that a deductive argument can give the conclusion is absolute; either the conclusion is shown to be true, or it is not.

An inductive argument is intended to provide probable, but not conclusive, support for its conclusion; an inductive argument that succeeds in providing this is said to be *strong*. An argument which fails to provide such support is weak. When inductively strong arguments have true premises - actually, genuinely true premises - they are said to be *cogent*, and, logically enough, when they do not, they are not cogent. Inductive arguments, however, are not truth-preserving, because the arguments for the conclusion are not logically absolute.

Judging Arguments

How can you tell whether an argument is deductive or inductive? And how can you determine whether it gives good reasons for accepting the conclusion (i.e., whether the argument is sound or cogent)?

Firstly, find the argument's conclusion and premises. What is the argument trying to say, and what support for this does it provide? Is it a case where if the premises are true then the conclusion must be true? If so, this is a deductive argument. However, if it is a case where the truth of the premises means that the conclusion is probably true, then it is an inductive argument. Finally, assess the validity of the argument; does the argument succeed or fail in offering conclusive or probable support for its conclusion?

Finding The Assumptions Of Arguments

Authors often rely on previous knowledge or context in their work, and to quote out of this context is jarring because the unstated premises which make sense in the author's work are not carried forward into your own. When should you explain an unstated, or *implicit*, premise?

Take the following example:

"Health officials claim that because the foods and beverages mentioned or consumed on many television programs are extremely low in nutritional value, watching television has a bad influence on the dietary habits of television viewers."

(The assumption in the above statement is that watching = doing.)

You should do so when there appears to be something essential missing from the argument. This does not mean common sense or generally accepted assumptions (in a geography essay, we can safely assume that the world is round, otherwise you'll be over the word count before

you've even started!), but something more which the argument requires.

The trouble is, it is often the case that the problem with the argument is not unstated premises or implicit knowledge, but an invalid or weak structure. How can you distinguish between the two? To make sure that you've been reasonable and thorough in finding implicit premises, firstly, search for a credible premise that would make the argument valid. Use the one that is the most plausible and best represents the author's intent. If this can't be done, then search for a credible premise that would make the argument as strong as possible. After this, evaluate the reconstituted argument.

Argument Patterns

Argument forms are distinct from argument content, and the more common argument patterns are deductive (see above) or conditional, which is when an argument contains at least one "if X then Y" statement. A conditional argument contains an antecedent (the "if X" part) and a consequent (the "then Y" part).

An independent premise stands alone; it offers support to a conclusion without the help of other premises. A dependent premise has to work together with other dependent premises to collectively support the conclusion.

Diagramming Arguments

Diagramming arguments can really help to visually assess an argument's validity. Use the following guidelines to annotate a text, and see how much easier it is to look at it objectively.

- Underline all premise and conclusion indicator words.
- Number the statements.
- Cross out all extraneous material (exclamations, irrelevant material)
- Draw diagram using squares for premises and circles for conclusions.
- Sub-conclusions get a circle inside a square.
- Dependent premises share one line and one arrow.
- All arrows point down.

Key Words: Making Sense Of Arguments

Antecedent: the first part of a conditional statement (If, then).

Cogent Argument: A strong inductive argument with all true premises.

Conditional Statement: an 'if, then' statement. It contains both an antecedent and a consequent.

Consequent: the second part of a conditional statement—the 'then' part.

Deductive Argument: An argument intended to provide logically conclusive support for its conclusion.

Dependent premise: A premise that depends on at least one other premise to provide joint support for the conclusion.

Independent Premise: A premise that does not rely on any other premises—it provides support for the conclusion on its own.

Inductive argument: An argument where the premises are intended to provide probable, not conclusive, support for the conclusion.

Invalid Argument: a deductive argument that fails to provide conclusive support for its conclusion.

Strong argument: an inductive argument that succeeds in providing probable support for its conclusion.

Syllogism: A deductive argument made of three statements: two premises and a conclusion.

Truth-preserving: a characteristic of a valid deductive argument in which the logical structure (form) guarantees the truth of the conclusion if the premises are true.

Valid argument: A deductive argument that succeeds in providing conclusive support for its conclusion

Weak Argument: An inductive argument that fails to provide strong support for its conclusion.

VALID Conditional Argument Forms	*Example*

1. Affirming the Antecedent (MODUS PONENS)

If P, then Q.	If it's raining, it's windy.
P	It's raining.
Therefore, Q.	Therefore, it's windy.

2. Denying the Consequent (MODUS TOLLENS)

If P, then Q.	If it's sunny, I am happy.
Not Q.	I am not happy.
Therefore, not P.	Therefore, it is not sunny.

3. Hypothetical Syllogism

If P, then Q.	If it's sunny, then the birds chirp.
If Q, then R.	If the birds chirp, then the bees sting.
Therefore, if P, then R.	Therefore, it it's sunny, then the bees sting.

4. Disjunctive Syllogism

Either P or Q.	Either she wears pink or yellow.
Not P.	She's not wearing pink.
Therefore, Q.	Therefore, she's wearing yellow.

INVALID Conditional Argument Forms	*Example*

1. Affirming the Consequent

If P, then Q.	If he's angry, then she's sad.
Q.	She's sad.
Therefore, P.	Therefore, he's angry.

2. Denying the Antecedent

If P, then Q.	If he's angry, then she's sad.
Not P.	He's not angry.
Therefore, not Q.	Therefore, she's not sad.

The Core Challenge Of Any Argument

Reasons for Doubt

When two claims conflict, they simply cannot both be true; at least one of them has to be false. Therefore, if a claim conflicts with other claims that we have good reason to accept, then there are good grounds for doubting this claim. There is no justification for believing either claim until you determine which claim is true, so you may need to do some research to establish the evidence for each claim in order to assess both claims critically.

This background information is (or at least, should be) a collection of well-supported beliefs that we all rely on in order to inform our actions and choices. So, if a claim conflicts with our background information, then there is good reason to doubt it, and the more background information that the claim conflicts with, the more reason to doubt the claim. It is not reasonable to accept a claim if there is good reason to doubt it. Accordingly, our belief in a claim should be proportionally to its supporting evidence; more evidence should instil a stronger belief, and less evidence should instil weaker belief or doubt.

It is not just the quantity of reasons which should inform our judgements, but also the strength of reasons. Experts, or people who are more knowledgeable in a particular subject area or field than most others, provide us with stronger reasons for believing a claim because they are far more likely to be correct or accurate within their specialist area. They have access to more information on the subject than we do, and are better at judging this information than we are; consequently, reasons for a claim which are given by experts are stronger and worth more than reasons for a claim given by non-experts. So, if a claim conflicts with expert opinion, we have good reason to doubt it.

So, how can you tell if an expert really is an expert? Research their backgrounds; have they received education and training from reputable places? Do they have experience in making reliable judgments in this area? How is their reputation among their peers, as reflected in the opinions of others? And what are their professional accomplishments? These last two criteria, their reputation and their accomplishments, are very important because they are more likely to be correlated with the intellectual qualities expected in true experts. Education and experience can be misleading.

This links in with the fallacy of appealing to authority. People often believe a bogus expert opinion in two ways; regarding an expert in one field as an expert in all fields, and regarding a non-expert as an expert. Although somebody can be an expert in their specialist area, that does not make them an expert outside that area; any opinion they offer outside their field is no more authoritative than non-experts. We also sometimes give notable people more credibility than their expertise is worth - people like actors, athletes, politicians, or indeed any recognisable name. This is a more prevalent form of appeal to authority, as any tv show featuring “talking heads” will demonstrate.

However, even after finding a bona fide expert, different experts often disagree over a claim; this is where critical thinking is necessary in order to establish whether the experts have an agenda or personal, non-rational reasons for their opinions. How, then, can you establish whether an expert is biased? When an expert is biased, they are motivated by something other than the search for the truth, such as financial gain, professional ambition, or an emotional investment. We can suspect bias when an expert is being paid by a special-interest group or identifies with a certain group of people, such as institutions, social circles, or particular religious groups.

Personal Experience

Personal experience, broadly defined, arises from our senses, our memory, and our judgement involved in those faculties; it’s reasonable to accept

the evidence provided by personal experience, but only if there's no good reason to doubt it. This is because personal experience is reliable, but by no means infallible; our senses and memory are useful but cannot be trusted.

There are always impairments to our senses and memory, and if any impairing factors are at play, the risk of misperception is high; this gives us good reason to doubt the trustworthiness of what we experience. Perception and memory are constructive, which means that an experience may be an inaccurate representation of the actual event. Expectation is another common trap; we often perceive exactly what we expect to perceive, and therefore our expectations construct our perception and memory. This is similar to pareidolia, the psychological phenomenon of a vague stimulus being interpreted as far more significant than it actually is; an example of this is the Rorschach Inkblot Test, where a random composition of blotches is interpreted as a visual image. Expectation, therefore, affects our perception of events. Finally, there is the problem of innumeracy; people are terrible at figuring probabilities. One common error is the misjudgement of coincidences. Coincidences occur all the time, but people tend to focus on particular coincidences and explain them with fate, or similar non-critical methods. Another common error is the idea that past events can affect the outcome of a random event; this is known as the Gambler's Fallacy. If a coin is flipped three times in a row and lands on heads each time, people are often likely to believe that landing on heads is more likely due to past events, when in actual fact, the chances are 50:50 every time, no matter what.

Fooling Ourselves

Fooling ourselves is the very human tendency to resist evidence that flies in the face of our cherished beliefs, and despite its irrationality, it is difficult to overcome. We deny evidence, or change it to suit our own beliefs, while applying more critical scrutiny to evidence that doesn't support our beliefs and expectations. There is also the *confirmation bias*, which is when we seek out and use only the evidence that confirms our expectations, while ignoring evidence which does not. Another common mistake is to prefer the available evidence; evidence that is more memorable or striking is more psychologically available, despite often being unfounded. This is clear from newspapers; sensationalist tabloid headlines are more striking and more memorable, and therefore often carry greater influence, than more measured, more accurate broadsheet headlines. Speaking of which …

Claims in the News

Knowledge is true belief supported by good reasons; information in the media doesn't have this vaulted status. Editors and reporters may skew their reporting, deliberately or unconsciously, both in order not to offend their advertisers, readers, and stakeholders, and in order to attract more advertisers, readers, and stakeholders. How do we know what claims in the news are worthy of belief?

Firstly, consider whether the report conflicts with what you have good reason to believe. Does the report fit with established background knowledge of the area? Secondly, critically analyse the language. Reporters may use loaded, biased language, emotional appeals, appeals to authority, and any of the logical fallacies already described in this guide; all of which undermine the reasoning of the report. There is also the source of the information - did the reporter uncover the facts themselves? This brings into question the reliability of the report. Is the reporter known for covering only certain stories in the past? It is also necessary to check for missing information, false emphasis, and to look at alternative news sources before reaching a thorough decision concerning a report's claim.

Advertising

All advertising is designed to influence, and it certainly does influence us; however, we are often in denial or oblivious to how much it influences us. Advertisements use the following methods to persuade and affect our decisions:

- Identification: they invite us to identify with attractive or famous people.
- Slogans: they contain catchy, memorable phrases that are difficult to forget.
- Misleading Comparisons: they are often deliberately vague or ambiguous when comparing the product being advertised with rival products.
- Weasel Words: this is when advertisers want to appear to make a strong claim, but to avoid blatant lying. These phrases make the advertisement technically true, but superficially misleading, such as *reportedly, possibly, virtually, may, seem, perhaps* … for example, "inside this envelope may be your Cruise Vacation Prize!".

This sentence is not blatantly false, but it creates false expectations in the reader, who is led to believe that the possibility of it being true is far greater than it actually is.

So, we generally have good reason to doubt advertising claims and to be wary of advertiser's persuasive powers.

Key Words: The Core Challenge of Any Argument

Appeal to Authority: the fallacy of relying on someone's opinion who is deemed to be an expert but in fact is not an expert.

Background information: the large collection of very well supported beliefs that we all rely on to inform our actions and choices—it's common sense and common knowledge.

Expert: someone who is more knowledgeable in a particular subject matter or field than most others are.

Gambler's fallacy: the error of thinking that previous events can affect the probabilities in the random event at hand.

Faulty Reasoning

Common flawed arguments are known as fallacies, and described as fallacious. Fallacies can often seem plausible and can be psychologically persuasive, but they are logically impotent and can be divided into two categories; irrelevant premises and unacceptable premises.

Irrelevant Premises

Irrelevant premises are premises which have no bearing on the truth of the conclusion. There are 11 fallacies associated with irrelevant premises, detailed in the table below.

Unacceptable Premises

Unacceptable premises are premises which are relevant to the conclusion, but nonetheless dubious in some way; they do not adequately support the conclusion, the evidence offered is too weak to support the claim, or even no support is offered at all. There are 5 fallacies associated with unacceptable premises, also detailed in the table below.

Fallacy Name	Definition	Additional Notes & Examples
Irrelevant Premises		
Genetic Fallacy	Arguing that a claim is true or false based on the origin of the claim.	They fail because they are recognised solely on the basis of where they come from and not on their merits. "Wanda has no idea what she's talking about since she is not aboriginal."
Composition Fallacy	Arguing that what is true of the parts must be true of the whole.	Likewise, we assume that what's true of a member of a group is true of the group as a whole. "Each note in the song is great. Therefore, the song will be great."
Division Fallacy	Arguing that what is true of the whole must be true of the parts.	These arguments are fallacious because they assume that the characteristics of the whole must transfer to the parts and vice versa. "Her apartment building is nice, so her unit must be nice."
Appeal to the Person (*ad hominem*, 'to the man') 3 types: 1. Abusive *ad hominem* 2. Circumstantial *ad hominem* 3. Tu Quoque	Rejecting a claim by criticising the person who makes it rather than the claim itself. *Tu Quoque* –'you're another'. A type of *ad hominem* fallacy that argues that a claim must be true (or false) just because the claimant is hypocritical. "Poisoning the Well"—the idea that you can't get safe water out of a poisoned well, you can't get reliable claims out of a discredited claimant.	They are fallacious because they attempt to discredit by appealing to a person's character, or circumstances. "Jason claims to support the environment, but he drives a huge SUV, so he can't really support the environment, he must not support it." (*tu quoque*)

Fallacy Name	Definition	Additional Notes & Examples
	But you can't automatically dismiss someone for this.	
Equivocation	This fallacy is the use of the same word in two different senses in an argument.	Often plays a central part in arguments about abortion. "The *end* of everything is its perfection. The **end** of life is death. Therefore, death is perfection." End = means both *purpose* and **termination**.
Appeal to Popularity	This fallacy arises when arguing that a claim must be true merely because a substantial number of people believe it.	It is fallacious because it assumes truth merely because many people believe it. "The vast majority of Canadians believe the monarchy is a good thing."
Appeal to Tradition	Arguing that a claim is true because it's part of a tradition.	This is fallacious because tradition, like the popular opinion, can be wrong; however, automatically rejecting a claim because it's traditional is not reasonable either. "Acupuncture has been used for thousands of years in China. So, it must work."
Appeal to Ignorance	Arguing that a lack of evidence proves something. OR Arguing that a claim must be false because it hasn't been proved to be true.	A lack of evidence can neither prove nor disprove something—it just shows our ignorance. "You can't prove that God doesn't exist, so he must." This is related to the Burden of Proof, which is the weight of evidence or argument required by one side in a debate. There is a problem when Burden of Proof is placed on the wrong side. Usually, the Burden of Proof rests on the side that makes a positive claim—an assertion that something exists or is the case, rather than something doesn't exist or isn't the case.
Appeal to Emotion	Use of emotions as premises in an argument. Trying to persuade someone of a conclusion solely by arousing their feelings rather than presenting relevant reasons Rhetoric is an example of this.	Arguments try to persuade through logic and reasons. Rhetoric tries to persuade through the artful use of language.

Fallacy Name	Definition	Additional Notes & Examples
Red Herring	The deliberate raising of an irrelevant issue during an argument.	People put forth claims and then couple it with what seem to be supporting claims, but in fact are mere distractions.
Straw Man	The distorting, weakening, or oversimplifying of someone's position so that it can be easily attacked.	Reinterpret claim X so that it becomes weak or absurd claim Y. Attack claim Y. Conclude that claim X is unfounded.

Fallacy Name	Definition	Additional Notes & Examples
Unacceptable Premises		
Begging the Question (arguing in a circle)	This is the attempt to establish a conclusion by using that conclusion as a premise in the argument.	P. Therefore, P. "The bible says that God exists. The bible is true because God wrote it. Thus, God exists."
False Dilemma	Asserting that there are only two alternatives to consider when there are actually more than two.	
Slippery Slope	Arguing, without good reasons, that taking a particular step will inevitably lead to a further, undesirable step.	Doing A will lead to B, and B will lead to C. So, you shouldn't do A. This is often used in arguments about marijuana as a gateway drug.
Hasty Generalization	This happens when we draw conclusions about a whole group based on an inadequate sample from the group.	"All Aboriginals have drinking problems, because my neighbour has a drinking problem and he's aboriginal."
Faulty Analogy	Things being compared are not sufficiently similar in relevant ways. These arguments are said to be weak	We conclude something about the TARGET by comparing it to the ANALOGUE "Eating apple pie is like killing a squirrel with a BB gun." Target=eating apple pie, Analogue=killing squirrels

Deductive Reasoning and Propositional Logic

Propositional logic, also known as truth-functional logic, is the branch of deductive reasoning that deals with the logical relationships among symbols to represent and clarify these relationships. Propositional logic allows you to understand the dynamics of deductive reasoning and evaluate the validity of very complex arguments.

Connectives and Truth Values

Propositional logic uses symbols to stand for the relationships between statements. This is not just the variables P and Q to represent propositions (or statements), but the language of symbolic logic, connectives which specify the relationship between the statements and shape the form of the argument. These connectives are detailed below:

Symbol	*Meaning*	*Example*
&	Conjunction (and)	p & q It rained, and Marty cried.
V	Disjunction (or)	p v q Either it rained, or Marty cried.
~	Negation (not)	~p Marty did not cry. It is not the case that Marty cried.
→	Conditional (if, then)	p→q If it rained, then Marty cried.

A simple statement is one that doesn't contain any other statements as constituents, while a compound statement is composed of at least two simple statements. Every statement has a truth value; a true statement has a truth value of TRUE, while a false statement, predictably, has a truth value of FALSE. Questions and exclamations do not have truth values; they seek to establish truth values or comment upon them, but do not have inherent truth values themselves.

The combination of truth values in an argument affects its validity. If there is a combination where the premises could be true and the conclusion false, then the argument is invalid; if not, the argument is valid.

Conjunction

A conjunction is two simple statements joined by a connective to form a compound statement. Each component of the compound statement - i.e., each simple statement - is known as a conjunct. However, it is important to make sure that the connective is actually joining two statements together, and is not denoting a set of compound nouns. The truth value of a conjunction depends on the combination of truth values in the conjuncts, and a graphic way of displaying all truth value possibilities can be shown in a truth table.

Conjunction Truth Table:

P	Q	P & Q
T	T	T
T	F	F
F	T	F
F	F	F

So, if just one statement in the conjunction is FALSE, then the whole conjunction is FALSE; only if BOTH conjuncts are TRUE is the whole conjunction TRUE. For example, if Wales play Ireland at rugby, and P represents the statement "Wales won" and Q represents the statement

“Ireland lost”, then P & Q can only be TRUE if Wales won and if Ireland lost.

Disjunction

We assert that either P *or* Q is true (even though both might be), and that even if one of the statements is false, the WHOLE disjunction is still TRUE. Each statement in a disjunction is called a disjunct, and the symbol for disjunction ‘v’ is called a wedge, which is roughly equivalent to the word “or”. “Either” or “neither” signals the start of a disjunction.

Disjunction Truth Table:

p	Q	P v Q
T	T	T
T	F	T
F	T	T
F	F	F

So, the table shows us that P v Q is TRUE in every combination, except where P and Q are both FALSE. There are two senses to disjunctions; there is the inclusive sense, where P v Q means “P, or Q, or both”, and the exclusive sense, where P v Q means “P, or Q, but not both”. The standard practice in logic is to assume the inclusive sense.

Negation

The denial of a statement, which we indicate with the word ‘not’, or a term that means the same thing. The symbol ~ is called a tilde, and when we say ~P aloud, we say “not P”. This symbol makes a true statement becomes false, and makes a false statement becomes true. In logical terms, a double negation is the same thing as no negation.

Negation Truth Table:

P	~Q
T	F
F	T

Conditional

When symbolised, a conditional looks like P → Q, where the arrow is the connective. A conditional asserts that if the antecedent is true, then the consequent must be true.

Conditional Truth Table:

p	Q	P → Q
T	T	T
T	F	F
F	T	T
F	F	T

So, a conditional is FALSE in only one situation: where the antecedent is true but the consequent is false.

There are several ways of phrasing conditionals:

- If: introduces the antecedent
- Only if: introduces the consequent
- Provided: introduces the antecedent
- Unless: introduces the antecedent
- Whenever: introduces the antecedent

Inductive Reasoning

Firstly, a quick recap on inductive arguments, last seen in Making An Argument. Inductive arguments are intended to supply only probable support for the conclusion, not logically conclusive support as is the case with deductive arguments. If this support is provided, the argument is strong – if not, it is weak. The argument is cogent if its premises are TRUE.

There are three main forms of inductive reasoning:

1. Enumerative Induction

Many inductive arguments use the premises of one individual, or a small group of individuals, to form conclusions about the entire group. This pattern, from the particular to the general, is a natural and useful way of reasoning – we tend to form opinions about a thing based on the subset of information that we have about that thing, and apply our opinions on the subset to the whole.

A sample is a good example of inductive reasoning which uses enumerative induction. With samples, information is collected from sample members (the observed individuals of the target population) in order to form a conclusion about the target population (the whole collection of individuals in question) concerning the relevant property (i.e., what we're interested in). Enumerative inductive arguments can fail in two main ways – if the sample size is too small, and/or if the sample is not representative.

Sample Size

The larger the sample size, the more likely it is to reliably reflect the nature of the larger group. A conclusion drawn about a target group based on an inadequate sample size is known as a hasty generalisation. The more homogenous a target group is in terms of the property in question, the smaller the sample can be; the less homogenous, the larger the sample should be. For example, a sample about people who listen to rock music requires a large sample, while a sample about people who listen specifically to didgeridoo music from a certain region of Australia requires a small sample.

Representativeness

In order to be representative, a sample must resemble the target group in all ways that matter. A sample must be like the target group by having all the characteristics which are relevant to the sample, and must have these characteristics in the same proportions that the target group has. If not, then the sample is biased.

In all samples, you must be careful to avoid selective attention, which is the biased tendency to observe and remember things that reinforce our beliefs, at the expense of what the sample is actually telling us.

Random Sampling

Random sampling is where the sample is selected randomly from the target group. This ensures that the sample is representative, although each attempt at sampling will yield slightly different results. These differences are referred to as the margin of error, and competent samples will state both their results and their margin of error; for example, if 62 ± 5% of people in the UK were found to have been to France, this means that the true value is somewhere between 57% and 67%.

The confidence level is the probability that the sample will accurately reflect the target group within the margin of error. A confidence level of X means that there is an X% chance that the results from the sample group, taking into account the margin of error, will accurately reflect the results of the entire target population.

Opinion Polls

Opinion polls should be strong, have true premises, use a large enough sample that accurately represents the target population, and generate

accurate data. A poll can fail to do this due to poorly phrased or leading questions, bad interview technique, and data-processing errors.

2. Analogical Induction

Analogical induction is argument by analogy, or a comparison of two or more things which are apparently alike in specific respects. It is a useful tool, but can only establish conclusions with a limited degree of probability. The greater the degree of similarity between the two things being compared, the more probable the conclusion is.

A typical analogical induction form is:

> Thing A has properties P1, P2, P3 and P4.
> Thing B has properties P1, P2, and P3.
> Therefore, Thing B *probably* has property P4.

In order to judge the strength of an analogical inductive argument, the two things being compared must have relevant similarities (or dissimilarities), and it is essential to know in how many instances they have been compared, and how diverse the cases are.

Relevant Similarities
The more relevant similarities there are between the things being compared, the more probable the conclusion will be. Other, non-relevant similarities in an analogical induction can't strengthen the argument at all, as they have nothing to do with the conclusion.

Relevant Dissimilarities
Similarly, the more relevant dissimilarities there are between things being compared, the less probable the conclusion will be. Dissimilarities weaken arguments by analogy, because every relevant way in which the two things being compared are not similar serves to undermine an analogical argument.

The Number of Instances Compared
The greater the number of instances, or cases, that show the relevant similarities between the things being compared, the stronger the argument will be.

Diversity Among Cases
The greater the diversity among the cases that exhibit the relevant similarities, the stronger the argument will be.

3. Causal Arguments

When we try to answer questions that arise from chaos, we make a causal claim. A causal claim is a statement about the cause of things, and when we try to prove this statement, we make a causal argument. A causal argument is an inductive argument where the conclusion contains a causal claim, and can only give us probable conclusions. Causal arguments are best supported by inference to the best explanation, which is where we inductively reason to a causal conclusion by pinpointing the best explanation (or, causal claim) for a particular effect.

Testing for Causes

Mill's Methods of Inductive Inference is the process of testing for causes, named after the philosopher John Stuart Mill.

Firstly, there is Mill's Method of Agreement, which states that if two or more occurrences of the phenomenon have only one relevant factor in common, then that factor must be the cause. Public health officials often use this method to identify causes in large populations of people. This can be shown in a logical schematic:

Instance 1: Factors A, B, and C are followed by result E.
Instance 2: Factors A, C, and D are followed by result E.
Instance 3: Factors B and C are followed by result E.
Instance 4: Factors C and D are followed by result E.

Therefore, C is probably the cause of E.

Similarly, there is also Mill's Method of Difference, which states that if a relevant factor is present when a phenomenon occurs and is absent when the phenomenon does not occur, then that relevant factor must be the cause. The logical schematic for the Method of Difference is as follows:

Instance 1: Factors A, B and C are followed by result E.
Instance 2: Factors A and B are not followed by result E.

Therefore, C is probably the cause of E.

Mill's Joint Method of Agreement and Difference is a combination of the two methods above, and when used together, it increases the probability that the conclusion is true. For example:

Instance 1: Factors A, B, and C are followed by result E.
Instance 2: Factors A, B, and D are followed by result E.
Instance 3: Factors B and C are not followed by result E.
Instance 4: Factors B and D are not followed by result E.

Therefore, A is probably the cause of E.

Finally, Mill's Method of Concomitant Variables is a process to establish the existence of correlation rather than causation. This examines factors that are closely correlated with the occurrences, and when two events are correlated, they are probably causally related. This often provides indirect evidence of one thing causing another; for example, the link between smoking and lung cancer is a good example of the dose-response relationship outlined in this schematic:

Instance 1: Factors A, B, and C are correlated with result E.
Instance 2: Factors A, B, and increased C are correlated with increased result E.
Instance 3: Factors A, B, and decreased C are correlated with decreased result E.

Therefore, C is causally connected with E.

It is essential to note that a correlation could just be a coincidence. Further evidence is needed to establish a direct cause between them.

Causal Confusions

There are five main mistakes made in causal arguments which undermine or contradict the argument. Firstly, there is the misidentification of relevant factors; a key issue, indeed, the key issue,

is whether the factors that precede an effect are actually relevant to that effect. To take the smoking and lung cancer example, you can bet that every single lung cancer patient has spent their entire life breathing, but this does not make “breathing” a relevant factor. Secondly, the mishandling of multiple effects often leads to confusion. The biggest difficulty in evaluating causal connections is that there are so many relevant factors to consider, so it is important to choose relevant factors carefully. Thirdly, people can often be misled by coincidence; don’t assume that a causal connection exists unless you have a very good reason for doing so. Then, there is confusing cause with natural temporal order, which is a particularly prevalent type of misjudgement about coincidences. This is similar to assuming that breathing causes or is related to lung cancer; this logical fallacy is known as *post hoc ergo propter hoc*, or “after that, therefore because of that”. Just because Event B follows Event A, it does not mean that Event A causes or is related to Event B. Similarly, people sometimes confuse cause and effect; we may realise that there’s a causal relationship between two factors, but we are unsure of which is the cause and which the effect is. Again, it is important that you don’t assume that a causal connection exists unless you have a very good reason for doing so.

Necessary and Sufficient Conditions

There is a difference between necessary conditions and sufficient conditions. A necessary condition for the occurrence of an event is a condition without which the event cannot occur, while a sufficient condition for the occurrence of an event is one that guarantees that the event occurs.

For example, humans cannot live without water; water is therefore a necessary condition for the continuation of human life. However, water by itself is not a sufficient condition for us to live; we also need oxygen, food, and all kinds of other things, so water alone does not guarantee the continuation human life.

In contrast, being born in the USA is a sufficient condition for American citizenship (or at least, it was at the time of writing). It is not the only way of qualifying for citizenship, nor is it absolutely necessary - citizenship can also be given according to the length of time spent living and working in the USA, or having American parents. However, being born in the USA does by itself guarantee that that person qualifies for American citizenship, so “being born in the USA” is a sufficient, but not necessary, condition for American citizenship.

Key Terms: Causal Arguments

Analogy: a comparison of two or more things alike in specific respects.

Argument by analogy (analogical induction): an argument making use of analogy, reasoning that because two or more things are similar in several respects, they must be similar in some further respect.

Biased Sample: a sample that does not properly represent the target group.

Causal argument: an inductive argument whose conclusion contains a causal claim.

Causal claim: a statement about the causes of things.

Confidence level: in statistical theory, the probability that the sample will accurately represent the target group within the margin of error.

Enumerative induction: an inductive argument pattern in which we reason from premises about individual members of a group to conclusions about the group as a whole.

Hasty generalization: the fallacy of drawing a conclusion about a target group based on an inadequate sample size.

Inference to the best explanation: a form of inductive reasoning in which we reasons from premises about a state of affairs to an explanation for that state of affairs:

> Phenomenon Q.
> E provides the best explanation for Q.
> Therefore, E is probably the cause of Q.

Margin of error: the variation between the values derived from a sample and the true values of the whole target group.

Necessary condition: a condition for the occurrence of an event without which the event cannot occur.

Random sample: a sample that is selected randomly from a target group in such a way as to ensure that the sample is representative.

Relevant property (property in question): in enumerative induction, a property or characteristic that is of interest in the target group.

Representative sample: in enumerative induction, a sample that resembles the target group in all relevant ways.

Sample (sample member): in enumerative induction, the observed members of a target group.

Sufficient condition: a condition for the occurrence of an event that guarantees that the event occurs.

Target group (or population): in enumerative induction, the whole collection of individuals under study.

Internalise These Lessons

This eBook was put together by our team of analysts from across the globe because we feel that professors do not spend enough energy educating students. It is designed to help you with dissecting your arguments and putting them back together. Within this eBook are the secrets that your university professors will never tell. Not because they do not want you to know about them, but simply because they do not have the time to help every student learn these fundamentals of arguing. With the application of these specific frameworks for academic writing, your essays will flow more smoothly, your arguments will be more coherent, and best of all, your grades will be much better.

Please note that it is easy to read this eBook, and it might already know some or all of the advice contained here but to get the most out of your time at university, you will need to internalise the lessons learned in this guide. You cannot simply learn about how to argue better, you have to put these lessons into practice immediately. You should refer back to this eBook on a regular basis because the best way to grow academically is to revise your intellectual development through practice.

PaperFeeback.com Team - January 2011