PHI1101 Textbook Notes

Chapter 1

Critical thinking: thinking about thinking. Evaluating our thoughts and subjecting them to logical analysis. The ultimate objective is to come to correct conclusions.

When we come to a conclusion, we have a **belief**. A belief is **propositional (True or False).**

Beliefs are the same as *judgements* and *opinions*. When declared in a propositional sentence, we call this a **claim** or an **assertion.**

Objective claim: whether it is True or False is independent of whether or not people think it is True or False. Ex. *There is life on Mars*. It doesn't matter what we believe; the truth of whether there is life on Mars or not is independent.

Subjective claim: whether a subjective claim is True or False is **not** independent of whether people think it is True or False. Ex. *Obama is cool*. It could be that one person believes he is cool, while another person does not believe he is cool. Either way the truth value of the claim is subjective to the person making the claim. However, if no one believes he is cool, then he is not cool.

Objective opinions: opinions that have a factual truth value. Note that the truth value does not necessarily need to be true.

Relativism: the idea that truth is relative to the standards of a given culture. If it is believed that water refers to the chemical H_2O in one culture, but it doesn't in a different culture. It does not mean that one culture is right and the other is wrong.

Moral Subjectivism: the idea that moral opinions are subjective. If you think that something is morally wrong, then it is wrong *for you* and no further truth needs to be considered.

Issues: an issue is simply a question. Ex. *Is he taller than her?* This raises the issue on whether some he is taller than some her. In other words, we are evaluating the truth value of the claim *He is taller than her.* Note that this would be an **objective issue** because whether he is taller or not is not subjective.

The first thing one must do when it comes to critically thinking is to determine what the issue is. If you cannot determine the issue, then there is no sense in continuing further.
Arguments: an argument presents a consideration for accepting a claim. Ex. *A dog would keep me company; so I should get one.*

The first portion of the argument that provides the reason for accepting an argument is called the **premise** of an argument. There can be more than one premise. The final portion is called the **conclusion**.

Some conclusions don't require an argument. Such as, *My throat is sore*, this can be determined automatically without an argument.

Cognitive Biases: belief formation is also affected by unconscious features of human psychology. These skew our apprehension of reality and interfere with our ability to think clearly, process information accurately, and reason objectively. Ex. *All dogs are animals. Some animals are German shepherds. Therefore some dogs are German shepherds.* This is not a logically founded argument because we might as well conclude that some dogs are cats.

The tendency to evaluate reasoning by the believability of its conclusion is known as **belief bias.** A closely related cognitive bias is **confirmation bias**, which refers to the tendency to attach more weight to evidence that supports our viewpoint.

Some cognitive biases involve **heuristics,** general rules we unconsciously follow in estimating probabilities. Ex. **Availability heuristic,** which involves unconsciously assigning a probability to a type of event on the basis of how often one thinks of that type of event. Ex. *Just because you see an increase in plane crashes on the news does not mean that the probability of a plane crash has increased.*

False consensus effect: refers to the inclination we may have to assume that our attitudes and those held by people around us are shared by society at large.

Bandwagon effect: refers to an unconscious tendency to align one's thinking with that of other people.

Negativity bias: the tendency people have to weight negative information more heavily than to positive information when evaluating things. Ex. *Nobody wants X* is more powerful than *Everybody wants Y*. This is hardwired in human brains: the brain displays more neural activity when reacting to negative things than to positive things.

Loss aversion: people generally are more strongly motivated to avoid a loss than to accrue a gain.

In-group bias: the tendency to form negative opinions of people who don't belong to our group.

Fundamental attribution error: the tendency to not appreciate that others' behaviour is as much constrained by events and circumstances as our own would be if we were in their position.

Obedience to authority: a tendency to comply with instructions from an authority figure.
Overconfidence effect: a bias that leads us to overestimate what percentage of our answers on a subject are correct.

Better-than-average illusion: a self-deception bias that leads us to overestimate our own abilities relative to those of others.

Knowledge: if you believe something, have an argument beyond a reasonable doubt, and have no reason to think you are mistaken, then you can claim you know it.

Chapter 2

Conclusions Used as Premises
The same statement can be the conclusion of one argument and a premise in another argument. Consider this:

Premise: The brakes aren't working, the engine burns oil, the transmission needs work, and the car is hard to start.
Conclusion 1: The car has outlived its usefulness.
Conclusion 2: We should get a new car.

Here the first conclusion is drawn from the premise, and is used to draw the second conclusion.

Unstated Premises and Conclusions

Premise: You can't check out books from the library without an ID.
Conclusion: Bill can't check out any books.

The unstated premise is that Bill has no ID. Moreover, we can have arguments with unstated conclusions:

The political party that best reflects mainstream opinion will win the presidency in 2016 and the Republican Party best reflects mainstream opinion.

The unstated conclusion is that the Republican Party will win the 2016 presidency. This is done because sometimes conclusions are too obvious to be worth mentioning.

Deductive: the premises of a deductive argument, if true, prove or demonstrate the conclusion.

Validity: an argument is valid if it isn't possible for the premise to be true and the conclusion to be false. Ex.

Premise: Jimmy Carter was president immediately before Bill Clinton, and George W. Bush was president immediately after Bill Clinton.
Conclusion: Jimmy Carter was president before George W. Bush.

There is no way that the premise here can be true and the conclusion can be false. Thus, it is valid.

Although the premise in the above example is not true, it is still a valid argument. Essentially: if the premises *were* true, the conclusion *could not* be false.

When the premise of an argument is **true** then it is a **sound argument**. So, the above argument is **not sound**. When we have a **valid sound argument** then the conclusion has been demonstrated.

Inductive: the premises of an inductive argument simple support the conclusion. They don't prove it. Ex.

Nobody has ever run a mile in less than 3 minutes. Therefore, nobody will ever run a mile in less than 3 minutes.

The more support the premises provide the **stronger** the argument is; the less, the **weaker**.

Beyond A Reasonable Doubt
Lower standard than deductive demonstration.

Unstated premises are determined by the listener, so it is possible that the unstated premise will make the argument deductive or inductive. Ex.

Inductive
Premise: The wind is from the south.
Unstated premise: Around here, south winds are *usually* followed by rain.
Conclusion: There will be rain.

Deductive
Premise: The wind is from the south.
Unstated premise: Around here, south wind is *always* followed by rain.
Conclusion: There will be rain.

Although, considering the nature of the argument, the speaker most likely intended the first argument.
Balance of Considerations: considering the different reasons for doing something. This may contain deductive and inductive elements. Ex.

*Should assault weapons be banned? On the one hand, doing that would violate the Second Amendment to the U.S. Constitution **[deductive]**. But on the other hands, when guns were outlawed in Australia the number of accidental gun deaths fell dramatically; that would probably happen here, too **[inductive]**. It is a tough call.*

Inference to the Best Explanation (IBE): an argument whose conclusions explains the cause of something. Ex.

I awakened this morning with a backache. The only thing that could explain it is the different mattress I slept on last night. Therefore, sleeping on that mattress caused my backache.

This is sometimes called **abduction.**

If … then … sentences are not arguments.

Lists of facts are not arguments.

A because B are sometimes not arguments. If what follows the because is a cause then it is not an argument. If it is evidence then it is an argument. Ex.

Mike is in his swimsuit because he was swimming.
Mike was swimming because he's in his swimsuit.

The first is a cause, while the second is an argument providing evidence.

Ethos: speaker's personal attributes can be used for persuading.
Pathos: some personal connection can be used for persuading.
Logos: rational argumentation can be used for persuading.

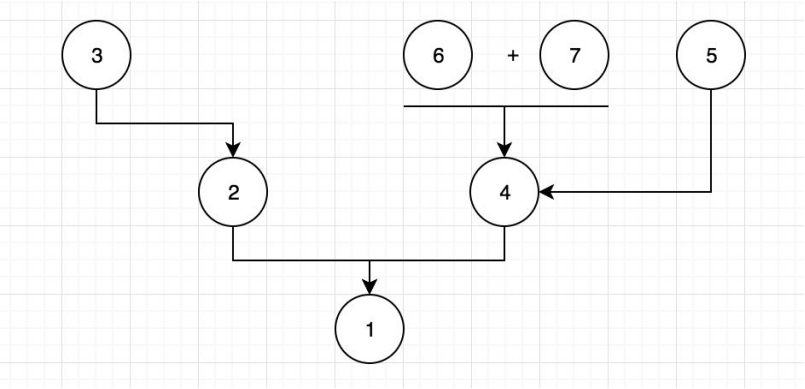
Clarifying an Argument's Structure

I don't think we should get Carlos his own car. He is not responsible in view of the fact that he doesn't care for his things. And anyway, we don't have enough money for a car for him, since we even have trouble making our own payments. Last week you yourself complained about our financial situation, and you never complain without really good reason.

This can be divided like so:

(1) [I don't think we should get Carlos his own car.] (2) [He is not responsible] in view of the fact that (3) [he doesn't care for his things.] And anyway, (4) [we don't have enough money for a car for him], since (5) [we even have trouble making our own payments.] (6)[Last week you yourself

complained about our financial situation,] and (7) [you never complain without really good reason.]



Arrows represent **therefore**. The + and line underneath two (or more) premises shows that they work in conjunction. Counterclaims are shown as an arrow with hash lines along the tail.

Chapter 3

Vague: if we cannot say with certainty what it includes and what it excludes.

When a claims is not too vague to convey appropriately useful information, its level of vagueness is acceptable.

Ambiguity: when it has more than one possible meaning. Ex. *Jessica is renting her house.* Does this mean Jessica is renting her house to someone or renting from someone?

Semantic ambiguity: a claim is ambiguous by containing an ambiguous word or phrase. Ex.

1. *Collins, the running back, always lines up on the right side.*
2. *Jessica is cold.*
3. *Aunt Delia never used glasses.*

1. It could be that he lines up on the right not left side or the correct side.
2. It could be talking about her temperature or her personality.
3. Glasses could mean eyeglasses or glasses for drinking.

Grouping ambiguity: results when it is not clear whether a word is being used to refer to a group collectively or to members of the group individually. Ex.

Secretaries make more money than physicians do.

This is true if the speaker is speaking collectively, because there are a lot more secretaries than physicians. But false if the speaker is referring to secretaries and physicians individually.

Syntactic Ambiguity: occurs when a claim is open to two or more interpretations because of its structure or syntax.

Players with beginners' skills only may use Court 1.

1. Beginners may use *only* Court 1.
2. Players with *only* beginners' skills may use Court 1.
3. *Only* players with beginners' skills may use Court 1.

Ambiguous pronoun references: occur when it is not clear to what or whom a pronoun is supposed to refer.

Generality: lack of specificity. The more *X's* that the word applies to, the more general.

Purposes of Definitions:

1. Tell us what a word means. This is called a **lexical definition.**
2. Sometimes the usual meaning of a word is too vague or too general. Ex. In some contract the word *dollars* may be used, but it is not specific to what kind of dollar. We make the meaning more precise by *stipulating* that dollars refers to Canadian dollars. We can also redefine words for different contexts, such as a *desktop* referring to a computer screen. Furthermore, we can assign meanings to words we invent.

   Definitions that make a term more precise or that stipulate new or different meanings for them are often referred to as **precising definitions** or **stipulative definitions.**
3. Can be used to persuade; such use is often labeled the **persuasive** or **rhetorical** use of definitions.

   This can be dangerous as we can assign **emotive meaning (rhetorical force)** to the meaning. Such as *government guaranteed health care* vs *government takeover of health care*. In other words, there is some other connotation associated with the term.

Definition by example (ostensive definition): pointing to, naming, or otherwise identifying one or more examples of the sort of thing to which a term applies.

Definition by synonym: giving another word or phrase that means the same as the term being defined.

Analytical definition: specifying the features that thing must possess in order for the term being define to apply to it. Ex. *A mongoose is a ferret-sized mammal native to India that eats*

snakes and is related to civets. So, if an animal is found to possess these feature, then it is a mongoose.

Chapter 4

Assessing credibility is done by evaluating the claims themselves and the source of the claim. Moreover, additional information and knowledge that may provide more context can help determine the credibility of a claim.

Two questions to ask:

1. When does a claim itself lack credibility - that is, when does its content present a credibility problem?
2. When does the source of a claim lack credibility?

A claim lacks inherent credibility to the extent that it conflicts with what we have observed or what we think we know - our background information - or with other credible claims.

Does the claim conflict with our personal observations?
We may be 100% sure. On the other hand, our observations and our recollections of them can go wrong all manner of reasons: tired, distracted, worried, emotionally upset, feeling ill etc.

Wishful thinking: which occurs when we allow hopes and desires to influence our judgement and colour beliefs.

Does the claim conflict with our background information?
Reports must always be evaluated against our background information - that immense body of justified beliefs that consist of facts we learn from our own direct observations and facts we learn from others.

When we first encounter a claim, we assign them a certain **initial plausibility**, a rough assessment of how credible a claim seems to us. This assessment depends on how consistent the claim is with our background information.

Interested Parties: a person who stands to gain from our belief in a claim. Must be viewed with much more suspicion than **disinterested parties**.

Evaluate expertise: education, experience, accomplishments, reputation, and position.

- Claims lack credibility to the extent they conflict with our observations, experience, or background information, or come from sources that lack credibility.
- The less initial plausibility a claim has, the more extraordinary it seems; and the less it fits with our background information, the more suspicious we should be.

- Interested parties should always be viewed with more suspicion than disinterested parties.
- Doubts about sources generally fall into two categories: doubts about the sources' knowledge or expertise and doubt about the source's veracity, objectivity and accuracy.
- We can form reasonably reliable judgements about a person's knowledge by considering his or her education, experience, accomplishments, reputation, and position.
- Claims made by experts, those with special knowledge in a subject, are the most reliable, but the claims must pertain to the area of expertise and must not conflict with claims made by other experts in the same area.
- Major metropolitan newspapers, national newsmagazines, and network news shows are generally credible sources of news, but it is necessary to keep an open mind about what we learn from them.
- Governments have been known to influence and even to manipulate the news.
- Sources like Wikipedia, institutional websites, and news organization can be helpful, but skepticism is the order of the day when we obtain information from known Internet sources or advocacy TV.
- Advertising assaults us at every turn, attempting to sell us goods, services, beliefs and attitudes. Because substantial talent and resources are employed in this effort, we need to ask ourselves constantly whether the products in question will really make the differences in our lives that their advertising claims or hints they will make. Advertisers are always more concerned with selling you something than with improving your life. They are concerned with improving their own lives.
- What goes for advocacy television also goes for talk radio.

Chapter 5

Rhetorical Force
Words and expressions have more than a literal meaning. They also have what is know as **emotive meaning** or **rhetorical force**. This is their power to express and elicit various psychological and emotional responses.

Rhetorical Devices

Euphemism: a neutral or positive expression used in place of one that carries negative associations. Ex. *Passed away* vs *died.*

Dysphemism: used to produce a negative effect on someone's attitude about something, or to tone down the positive associations it may have. Ex. *Eating animal flesh* vs *eating meat*.

Weaselers: help protect the claim from criticism. Ex. *Up to 5 more miles per gallon*. You may not gain any miles per gallon. But it's still technically true.

Downplayers: attempt to make someone or something look less important or less significant. Ex. *He only won by 6 votes.*

Stereotypes: a cultural belief or idea about a social group's attributes, usually simplified or exaggerated. Can be positive or negative.

Innuendo: the power of suggestion to disparage (say something bad about) someone or something. Ex. *Ladies and gentlemen, I am proof that at least one candidate in this race doesn't make stuff up.* This is insinuating that the other candidates are liars, without explicitly stating it.

Loaded Question: used to imply something without coming out and saying it through the form of a question. Ex. *Have you stopped beating your wife?* This assumes that the person asked beats their wife, which may be completely untrue.

Ridicule/Sarcasm: also known as a **horse laugh**. This can be done in numerous ways and are done to ridicule the speaker and making the listener think that their points are ludicrous.

Hyperbole: an extravagant overstatement or exaggeration.

Rhetorical definitions: employ rhetorically charged language to express or elicit an attitude about something. Ex. Defining abortion as *the murder of an unborn child.*

Rhetorical analogy: likens two or more things to make one of them appear better or worse than another. Ex. *Likening of Saddam Hussein to Adolf Hitler.*

Proof surrogates: suggests there is evidence or authority for a claim without actually citing such evidence or authority. Ex. *Sources state …* or *Studies show …*

Repetition: simply making the point over and over again at every opportunity.

Persuasion through visual imagery: while images, films and such are not arguments in of themselves, they can invoke certain psychological effects and emotions. Ex. *A photograph of children in Palestine being pulled out from the rubble may convince someone to donate and be on the Palestinians side of the argument.*

Rhetoric of demagoguery: Four techniques:

1. *Otherizing*: dividing people into two groups of people *us* and *them*.
2. *Demonizing*: trying to induce loathing of someone or something by portraying the person or thing as evil.
3. *Fostering xenophobia*: the fear or dislike of what is foreign or strange.
4. *Fear and hate mongering*: trying to stimulate and audience's fear, resentment and hatred.

Chapter 6

Fallacy: a mistake in reasoning, an argument that doesn't really support or prove the contention it is supposed to support or prove.

Relevance Fallacy: when the premise of an argument has no relevance to the issue in question. Also called **red herrings.**

Argumentum Ad Hominem: this fallacy is committed when you dismiss someone's position (idea, proposal, claim, argument, etc.) by dismissing him or her.

Poisoning the Well: essentially a pre emptive **ad hominem,** to dismiss what someone is *going to say*. Ex. *You can forget about what Bill is going to say, he's a priest so he has to think that way.*

Guilty by Association: refers to the concept that person is judged by the company that he or she keeps. Occurs when a speaker or writer tries to persuade us to dismiss a belief by telling us that someone we don't like has that belief. Ex. *You think waterboarding is torture? That sounds like something these left-wing college professors would say.*

Genetic Fallacy: occurs when it is argued that the origin of a contention in and of itself automatically renders it false. Ex. *Where on earth did you hear that? On talk radio?* or *God is just an idea people came up with way back before they had science.*

Straw Man Fallacy: occurs when a speaker or writer attempts to dismiss a contention by distorting or misrepresenting it. Ex. *What do I think about outlawing large ammunition clips? I think the idea of disarming everyone is ridiculous and dangerous.*

False Dilemma (Ignoring other alternatives): occurs when someone tries to establish a conclusion by offering it as the only alternative to something we will find unacceptable, unattainable, or implausible. Ex. *We either eliminate Social Security or the country will go bankrupts. Therefore we must eliminate Social Security.*

The Perfectionist Fallacy: two false dilemma arguments are so common they have their own names. One is called the **perfectionist fallacy:** committed when a speaker or writer ignores options between "perfection" and "nothing". Ex. *A single English course won't make anyone a great writer, so I don't see why we have to take one.*

The Line-Drawing Fallacy: the other version of the false dilemma fallacy. This occurs when a speaker or writer assumes that either a crystal-clear line can be drawn between two things, or

there is no difference between them. Ex. *You can't say exactly when a video game is too violent; therefore no video game is too violent.*

Misplacing the Burden of Proof: when people try to support or prove their position by misplacing the burden of proof. Ex. *Guns should be outlawed. I'll bet you can't think of a single good reason they shouldn't.* The speaker has incorrectly shifted the burden of proof to the listener. In the US, people have a constitutional right to own a gun, so the burden of proof is on the speaker to explain why the right should be removed.

Appeal to Ignorance: when someone asserts that we should believe a claim because nobody has proved it false, the fallacy is a version of misplacing the burden of proof. Ex. *Nobody has proved ghosts don't exist; therefore they do.*

Begging the Question (Assuming what you are trying to prove): a speaker or writer is guilty of begging the question logically when he or she tries to "support" a contention by offering as "evidence" what amounts to a repackaging of the very contention in question. Ex. *Obviously the president told the truth about Benghazi. He wouldn't lie to us about it.*

Appeal to Emotion: when a speaker or writer "supports" a contention by playing on our emotions rather than by producing a real argument.

Argument from outrage: attempts to convince us by making us angry rather than by giving us a relevant argument.
Scare Tactics: occurs when a speaker or writer tries to scare us into accepting an irrelevant conclusion. Ex. *You really should buy life insurance. What would happen to your family if you die? Remember, you are their main source of income.* Sometimes called the **Peer Pressure Fallacy.** Ex. *Obviously the federal government must cut spending. You agree with the rest of us, I assume.*

Appeal to Pity: occurs when a speaker or writer tries to convince us of the something by arousing our pity rather than by giving a relevant argument. Ex. *Jane is the best qualified candidate because she is out of work and desperately needs a job.*

Other appeals to emotion: playing on pride is **Apple Polishing**, making us feel guilty is **Guilt Tripping**, arousing envy is called **Appeal to Envy**, and playing on jealousy is **Appeal to Jealousy**.

Often some arguments can *seem* as though they are using some sort of appeal to emotion tactic, but they are sound valid arguments. Ex. *You should let that dog out of your car, because it is suffering from heat and thirst and will die very soon*. This is not an appeal to pity.

Irrelevant conclusion: relevance fallacies that do not fit into the above categories. Ex. *I don't think I missed too many classes to pass. My attendance has been much better lately.* An improvement in attendance doesn't mean he didn't miss too many classes.

Two Wrongs Make a Right: Ex. *Why should I tell them they undercharged me? You think they would say something if they overcharged me?* The fact that they wouldn't inform him of an overcharge only supports a negative appraisal of their ethics, not a positive appraisal of his.

Wishful Thinking: happens when we forget that wanting something to be true is irrelevant to whether it is true.

Denial: happens when we forget that wanting something to be false is irrelevant to whether it is false.

Chapter 7

Fallacies in induction: arguments that are supposed to raise the probability of their conclusions, but are so weak as to fail almost entirely to do so.

Generalizations: general statements are often supported by feeble inadequate reasoning; there are two important ways this can happen. This also concerns the reverse mistake, one that can be involved when we reason from a general statement to a specific statement.

Generalizing from too few cases (hasty generalization): arriving at a general statement or rule by citing too few supporting cases. Ex. *The food in L.A. is lousy, judging from this meal.* Also known as the **fallacy of the lonely fact.** Ex. *The police stopped me for driving 5 miles over the speed limit. Around here they will stop you for anything.*

Argument by anecdote: when a speaker or writer tries to support a general claim by offering a story. Ex. *Did you hear about Brad Pitt doing that thing? Hollywood actors are the worst.*

Fallacy of small sample: when someone derives a statement about all or most members of a **population** from a statement about a tiny sample of the population.

Generalizing from exceptional cases: arriving at a general statement or rule by citing an atypical supporting case. Ex. *Animals will live longer if they are on a calorie-restricted diet. This has been shown in experiments with rats.* This might be true for rats and also *might* be true for other animals, but to claim this for all animals is ridiculous.

Fallacy of biased sample: occurs when a speaker incautiously bases a generalization about a large population on an atypical or skewed sample. Ex. *Almost everyone in the Tea Party thinks*

the president should be impeached. Therefore most americans think the president should be impeached.

Self-selection fallacy: occurs when someone generalizes incautiously from a self-selected sample.

Accident: occurs when a speaker assumes that a general statement automatically applies to a specific case that is exceptional. Ex. *It is illegal to use a cell phone while driving. Therefore that police officer that was using his cell when driving committed a crime.*

Weak analogy (false analogy): weak argument based on a debatable or unimportant similarities between two or more things. Ex. *My mom is like Hitler. I don't think she'll let me go out tonight.*

Fallacious appeal to authority: a speaker commits this when they try to support a contention by offering as evidence the opinion of a non authoritative source. Ex. *My dad thinks the President lied. So, the President lied.*

Fallacious appeal to popularity (fallacious appeal to common belief): happens when a speaker treats an issue that cannot be settled by public opinion as if it can. Ex. *The Iranians have nuclear weapons. Everyone knows that.*

Fallacious appeal to common practice (fallacious appeal to tradition): try to justify a practice on the grounds that is traditional or is commonly practiced. Ex. *This is the right; it's the way it has always been done.*

Bandwagon fallacy: when a speaker uses "everyone thinks" as a psychological ploy. Ex. *Rand Paul has earned your support. Everyone is endorsing him.*

Post hoc, ergo propter hoc: "After this, therefore because of it". Committed when a speaker assumes that the fact that one event came after another established that it was caused by the other. Ex. *I prayed before my exam for an A. And I got an A. Therefore it was because I prayed.*

Overlooking the possibility of coincidence: a special case of **post hoc, ergo propter hoc**. Ex. *I didn't forward that chain mail. Then I got an accident. It's because I didn't forward that email.* It could just be coincidence.

Overlooking a possible common cause: another instance. Ex. *I slept with the lights on. Then I woke up with a headache. Therefore sleeping with the lights on caused my headache.* Leaving the lights on and waking up with a headache probably had a common cause, such as being tired or intoxicated.

Overlooking the possibility of random variation: occurs when we ignore the fact that value of variables can fluctuate randomly. Ex. *We asked a group of men to throw a football. Then they wore our wristband and threw 10 meters farther on average. So our wristband is why.*

Overlooking the possibility of regression: occurs when we ignore this fact: if the average value of a variable is atypical on one measurement, it is likely to be less atypical on a subsequent measurement. Ie. *a regression to the statistical mean.*

Cum hoc, ergo propter hoc: "With this, therefore because of it". Committed when the speaker assumes that the fact that two events happen at about the same establishes that one caused the other. Ex. *John had a heart attack while praying. Therefore the prayer caused the heart attack.*

Overlooking the possibility of coincidence: a special case of **cum hoc, ergo propter hoc**. Ex. *I got cancer when I was living in Chicago. Therefore living in Chicago caused my cancer.*

Overlooking a possible common cause: another instance. Ex. *Chimney fires and long underwear purchases increase in frequency at the very same time. Therefore chimney fires cause people to buy long underwear.* It's most likely because that it's getting cold that both of these are occuring.

Overlooking the possibility of reversed causation: Ex. *People who walk long distances enjoy good health. Therefore walking long distances will make you healthy.* It's probably the reverse. Good health means you can walk long distances.

Argument by anecdote (casual variety): trying to support (or disprove) a cause-and-effect claim by telling a story. Ex. *Statistics say cigarettes kill. But my grandfather was a smoker and lived to 110. And he didn't even die from a cigarette related disease; he was hit by a car.*

Slippery slope: argument that rests on an unsupported warning that is controversial and tendentious, to the effect that something will progress by degrees to an undesirable outcome. (A tendentious assertion is one that is slanted toward a particular point of view). Ex. *We should not require gun owners to carry liability insurance, because if we do that, before long they will repeal the Second Amendment.*

Untestable explanation: when someone offers an explanation that could not be tested even in principle. Ex. *He has heart issues because of sins done in a previous life.*

Chapter 8

There are three formal fallacies: *affirming the consequent, denying the antecedent, and undistributed middle.*

Affirming the consequent: Ex.

1. *If Jane is a member of sorority, then Jane is a female.*
2. *Jane is a female.*
3. *Therefore, Jane is a member of sorority.*

The structure or "form" of this argument is what makes it invalid rather than its content. In other words.

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

The first part of the claim is the **antecedent**, the part after is the **consequent.**

Denying the antecedent: Ex.

1. *If Sandy passed the final, then she passed the course.*
2. *Sandy did not pass the final.*
3. *Therefore, Sandy did not pass the course.*

In other words:

1. *If P then Q.*
2. *Not P.*
3. *Therefore, not Q.*

The undistributed middle: happens when a speaker or writer assumes that two things related to a third thing are otherwise related to each other. Ex.

1. *All cats are mammals.*
2. *All dogs are mammals.*
3. *Therefore, all cats are dogs.*

In other words:

1. *X has feature a.*
2. *Y has feature a.*
3. *Therefore, X is Y.*

Or,

1. *All Xs are Ys.*
2. *a (some individual) is a Y.*
3. *Therefore a is an X.*

Or,

1. *X is a Z.*
2. *Y is a Z.*
3. *Therefore, X is a Y.*

Finally,

1. *If P is true, then Q.*
2. *If R is true, then Q.*
3. *Therefore, if P is true, then R is true.*

Fallacies of Equivocation and Amphiboly
Ambiguous claims can produce a fallacy as well, Ex. *All banks are alongside rivers, and the place where I keep my money is a bank. Therefore the place where I keep my money is alongside a river.* Here the speaker is referring to a river bank not a monetary bank. This is the fallacy of **equivocation**: when semantic ambiguity leads to an incorrect conclusion.

Amphiboly is the fallacy for syntactic ambiguity. Ex. *If you want to take the motor of the car, I'll sell it to you cheap.* Does "it" refer to the car or the motor?

Composition: occurs when a feature of the parts of something is erroneously attributed to the whole. Ex. *This building built from rectangular bricks; therefore it must be rectangular.*
Ex. *The public thinks highly of individual members of Congress. Therefore, the public thinks highly of Congress as a whole.*

Division: opposite of composition; occurs when a feature of the whole is erroneously attributed to the individual parts. Ex. *My stock portfolio has gone up. Microsoft is in my stock portfolio. Therefore Microsoft has gone up.* This does not necessarily need to be true.

Confusing explanations with excuses: It is one thing to *explain* why or how something may have happened, and it is another thing entirely to *justify* or *excuse* the event. Ex. *I heard on the History channel that the poor economy after World War I helped Hitler gain power. Why are they trying to excuse the Germans for what they did?* They're not excusing them, they are simply explaining what had happened. There is no argument.

Confusing contraries and contradictories: Ex.

Visitor: I understand that all the fish in this pond are carp.
Curator: No, quite the opposite, in fact.
Visitor: What? No carp?

"None are carp" is not the opposite of "All are carp". A pair of claims that are exact opposites of each other are **contradictories**, meaning they *never* have the same truth value. But two claims that can not both be true, but both be false are not exact opposites: they are **contraries**.

Consistency and inconsistency: a group of beliefs is considered to be consistent if, and only if, it is possible that each and every one of them is true at the same time. A group of beliefs is inconsistent if it is not possible for all of them to be true at the same time. Individual claims can also be consistent or inconsistent. It is consistent if it was at least *possible* for it to be true, and it is inconsistent if it simply cannot be true - in which case it is self-contradictory.

Miscalculating probabilities: common mistakes people make when they calculate probabilities. Ex. *Rolling a 1 is a ⅙ chance. So rolling snake eyes is a 2/12 chance.*
It's actually (⅙)(⅙)=1/36

Gambler's Fallacy: common mistake when we don't realize independent events are really independent. Ex. *The last 3 coin flips were heads. It's got to be tails now.* Remember when dealing with independent events, past history has no effect.

Overlooking Prior Probabilities: the **prior probability** of something is its probability everything else being equal. The prior probability of a coin flip coming up heads is 1 in 2, is 0.5. The prior probability of a given newborn baby's being male is also .5, since about 50 percent of newborns are male. This fallacy occurs when someone fails to take these underlying probabilities into account.

Ex. *Bill is the best football player in school. Henry is the best hockey player in school. Their chances of becoming pro athletes are equal.* But this is not the case because the chances of becoming a pro footballer is much better than becoming a pro hockey player, by looking at previous probabilities.
Overlooking false positives: simple a false alarm. Ex. *Check engine light comes on, but nothing wrong with your car.* This fallacy occurs when the probabilities of something's happened are calculated.

Ex. *Ten percent of the people in in Hayfork have come down with a stomach ailment, and most of these people ate vegetables from Olsen's stand in the public market. It seems wise to street clear of Olsen's stand.* This doesn't consider those who ate the vegetables and didn't get sick. When everything is taken into consideration, we find that a very small portion of people who ate from the stall got sick. Therefore, it is not Olsen's vegetables that are causing the stomach ailment

Chapter 9

Categorical logic: logic based on the relation of inclusion and exclusion among classes. Like propositional logic, categorical logic is useful in clarifying and analyzing deductive arguments.

Category: a group or a lass or a population. Ex. *Dogs, Cats, Christians, Arabs, People who read Critical Thinking.*

In the form, *All X are Y*, *X* and *Y* are known as **terms**; where *X* is the **subject term** and *Y* is the **predicate term.** Ex. *All Arabs are Middle Eastern. Arabs* and *Middle Eastern* are terms, where *Arabs* is the subject term and *Middle Eastern* is the predicate term.

There are 4 different kinds of categorical claims:

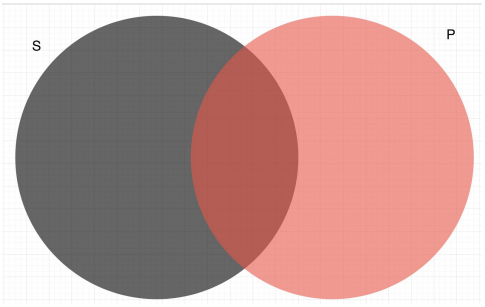
A: All X are Y.
E: No X are Y.
I: Some X are Y.
O: Some X are not Y.

A and *E* are **universal** claims because they concern the entire category, while *I* and *O* are **existential** claims because they concern *at least 1* thing in that category.

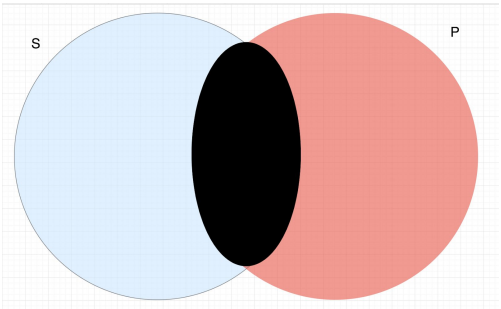
Venn Diagrams
In a venn diagram, when doing universal claims we black out the area that are *empty*; when doing existential claims we mark the categories where the claim is correct with an X.

Ex.

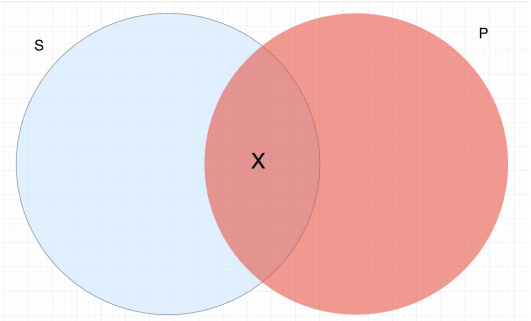
A: All S are P.



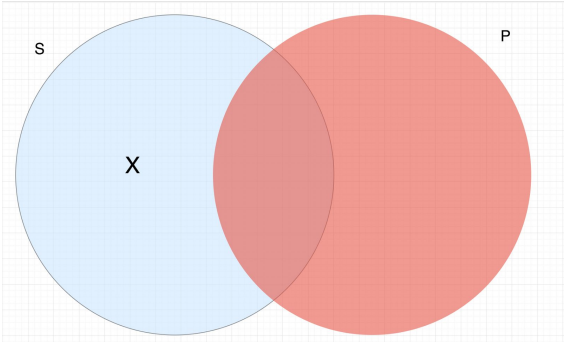
E: No S are P.



I: Some S are P.



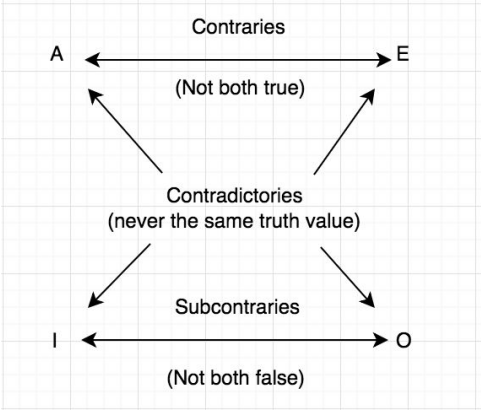
O: Some S are not P.



The two claims types that *include* one class or part of one class within another (*A and I*) are **affirmative claims.** The other two claim types that *exclude* one class or part of one class from another (*E and O*) are **negative claims**.

Equivalent claims: two claims are equivalent, if and only if, they would be true in all and exactly the same circumstances. Essentially if the two claims are "saying the same thing". Ex. *Only sophomores are eligible candidates.* Would this be: *All sophomore are eligible candidates* or *All eligible candidates are sophomores*? Well, just because someone is a sophomore, doesn't necessarily mean they are an eligible candidate. We are saying that only sophomores are eligible, so if someone is a sophomore, they might or they might not be. But, everyone who is an eligible candidate *must* be a sophomore. Therefore the equivalent is *All eligible candidates are sophomores*.

The square of opposition: claims can be rewritten from universal claims to existential claims and vice-versa. Ex. *All Sunnis are Muslim* can be rewritten as *Some Muslims are Sunni.* This is made simple using the square of opposition.



A and E can both be false, but they cannot both be true, so they are **contrary claims**.
I and O can both be true, but they cannot both be false, so they are **subcontrary claims**.
A and O, and I and E, respectively, cannot both be true, so they are **contradictory claims.**

Three Categorical Relations

Conversion
You can find the **converse** of a claim by switching the positions of the subject and predicate terms. Note, *All E and I claims, but not A and O claims, are equivalent to their converses.*

Obversion
This involves the *universe of discourse* (the group of people to which the claim applies). Ex. *Everybody passed the exam* refers to the class that took the exam, not everyone in the world.

Complementary terms are terms that are opposite of each other. Ex. *Students* and *Non Students.*

To find the **obverse** of a claim, (a) change it from affirmative to negative (or vice versa), (b) replace the predicate term with its complementary term. Ex.
A: All Sunnis are Muslim. → No Sunnis are Non Muslim.
E: No fish are mammals. → All fish are non mammals.
I: Some citizens are voters. → Some citizens are not non voters.
O: Some contestants are not winners. → Some contestants are non winners.

Contrapositive
You can find the contrapositive of a categorical claim by (a) switching the places of both the subject and predicate terms, (b) replacing both terms with complementary terms. Ex.
A: All Mongolians are Muslims. → All non Muslims are non Mongolians.
O: Some citizens are not voters. → Some non voters are not non citizens.

Note *All A and O claims, but not E and I claims, are equivalent to their contrapositives.*

Categorical Syllogisms
A **syllogism** is a two-premise deductive argument. A **categorical syllogism** is a syllogism whose every claims is a categorical claim and in which three terms each occur exactly twice and in exactly two of the claims. Ex.
All Americans are consumers.
Some consumers are not Democrats.
Therefore, some Americans are not Democrats.

Major term: the term that occurs as the predicate term of the syllogism conclusion.
Minor term: the term that occurs as the subject term of the syllogism conclusion.
Middle term: the term that occurs in both of the premises but not at all in the conclusion.

Chapter 10

Truth-functional logic: propositional logic; that is, using letter terms to define claims and conclude arguments.

Claim variables: P's and Q's

Truth tables: a table used to represent the truth value of a letter claim. Ex.

p
T
F

Negation: the opposite truth value. Ex.

p	~p
T	F
F	T

Conjunction: a compound claim. If both truth values are true, then conjunction is true. Symbol is &.

Disjunction: If one of the truth value is true, then disjunction is true. Symbol is V.

Conditional claim: in the form p → q; read “If p, then q”, where p is the antecedent and q is the consequent.

Truth- functional equivalent: if both claims have the same truth values in the truth table.

If and only if: a bi-conditional claim: p ↔ q, can be thought of as p → q & q → p.

Modus Ponens: arguments in the form:

1. P → Q
2. P
3. Therefore, Q.

Modus Tollens: arguments in the form:

1. P → Q
2. ~Q
3. Therefore, ~P.

Chain argument: arguments in the form:

1. P → Q
2. Q → R
3. Therefore, P → R.

Disjunctive argument: arguments in the form:

1. P v Q
2. ~P
3. Therefore, Q.

Simplification: arguments in the form:

1. P & Q
2. Therefore, P.

Conjunction: arguments in the form:

1. P
2. Q
3. Therefore, P & Q.

Addition: arguments in the form:

1. P
2. Therefore, P v Q.

Constructive Dilemma: arguments in the form:

1. P → Q
2. R → S
3. P v R
4. Therefore, Q v S.

Destructive Dilemma: arguments in the form:

1. P → Q
2. R → S
3. ~Q v ~S
4. Therefore, ~P v ~R.

Double Negation: ~~P is the same as P.

Commutation: (P & Q) is the same as (Q & P); (P v Q) is the same as (Q v P).

Implication: (P → Q) is the same as (~P v Q).

Contraposition: (P → Q) is the same as (~Q → ~P).

DeMorgan's Law: ~(P & Q) is the same as (~P v ~Q); ~(P v Q) is the same as (~P & ~Q).

Exportation: (P → (Q → R)) is the same as (P & Q) → R.

Association: (P & (Q & R)) is the same as ((P & Q) & R).
Distribution: (P & (Q v R)) is the same as (P & Q) v (P & R).

Tautology: all values are true. (P v P) is the same as P; (P & P) is the same as P.

Chapter 11

Argument from analogy: an argument that something has an attribute because a similar thing has that attribute. Ex. *Bill likes hunting. Therefore his brother Sam likes hunting.* In this

argument, the things being compared are Bill and Sam; we call them **analogues**. Sam is the **conclusion-analogue** since he is the one argued to have the **attribute of interest** (liking hunting), because the **premise-analogue** Bill has it.

Ex. *Darby is an excellent dog-sitter. Therefore she would be an excellent babysitter.*
The conclusion-analogue (her performance as a babysitter) is argued to have the attribute of interest (being excellent) because the premise-analogue (her performance as a dog-sitter) is said to have it.

Note: the conclusion-analogue is sometimes called the *target analogue*; and the premise-analogue is sometimes called the *sample analogue*.

Evaluation of Arguments from Analogy

1. The more numerous and diversified the similarities are between the premise-analogue and the conclusion-analogue, the stronger the argument.
2. The more numerous and diversified the differences between the premise-analogue and the conclusion-analogue, the weaker the argument.
3. If there is more than one premise-analogue, the more numerous and diversified the premise-analogues are, the stronger the argument.
4. If there is more than one premise-analogue, the fewer the contrary premise-analogues, the stronger the argument, and the more the contrary premise-analogues, the weaker the argument.

Contrary premise-analogue: a premise-analogue that does not share the attribute of interest. Ex. *Bill, his sister, Sarah, and both parents like hunting. But the oldest brother, Peter, does not. Therefore the other brother Sam likes hunting.* Peter weakens the argument.

Attacking the analogy: the time-honored strategy for rebutting an argument from analogy - showing that the premise-analogue(s) are not as similar to the conclusion-analogue as stated or implied. If done properly, then we've determined the original argument was a **weak analogy**.
Ex.
Bill: *Since all Marxists are progressives, all progressives are Marxists.*
Jill: *Bill, that is a poor argument. That is like arguing that, since all dogs are animals, all animals are dogs.*

Note that analogies can be used for comparisons, explaining how things work, or what things are, but those don't consist of arguments. Ex. *Electricity going through a wire is like water going through a hose.*

Generalizing from a sample: when you reason that all, most, or some percentage of the members of a population have an attribute because all, most, or some percentage of a sample of the population have that attribute. Ex. *So far I've liked everyone of his lectures. Therefore, I will like all of his lectures.*

Evaluation of Arguments That Generalize from a Sample

1. The more atypical the sample, the weaker the generalization. An atypical (biased) sample is one that doesn't mirror or represent the overall population. It is one in which an important variable is disproportionately present or absent.
2. The less diversified the sample, the weaker the generalization.
3. Generalizations based on samples too small to accurately mirror the overall population are relatively weak.