ISS 305:002
Evaluating Evidence:
Becoming a Smart Research Consumer

2. Fallacies of reasoning

I. Notion of fallacies

II. Common deductive fallacies
   I. Fallacies of relevance
   II. Component fallacies
   III. Fallacies of ambiguity
   IV. Fallacies of omission

III. Common inductive fallacies

IV. Other fallacies, biases/errors, and heuristics

Reminder: Turn on your I<CLICKER

A or AA is the base

Fallacies

- A fallacious argument sounds reasonable or superficially true, but fails to provide good reasons to accept its conclusion (flawed/invalid) or is dishonest.
- **An argument can fail for many reasons. Like?**
- We humans too often "fall for" fallacious arguments that have certain forms/structures
  - We'll refer to them here as common/informal/rhetorical/logical *fallacies*
  - Such fallacies can also be thought of as *heuristics* = short cuts to help us make "quick and dirty" decisions

Many of the fallacies we'll consider look like deductive arguments; a few look like inductive arguments (https://web.cn.edu/kwheeler/fallacies_list.html)

Deductive arguments

Fallacies of Relevance – These fallacies appeal to evidence or examples that are not relevant to the argument at hand

- Ad Hominem
- Genetic Fallacy
- Appeal to Authority
- Bandwagon
- Appeal to Tradition / Past Practice
- Poisoning the Well
- Two Wrongs Make a Right
- Appeal to Emotion

Deductive Fallacies: 1. Ad hominem

Ad Hominem (Attack the Person)

- Disprove the conclusion of a person's argument by making a personal attack on the person
- Basic structure of Ad Hominem fallacy.
  A argues that B is true.
  A is a bad/ugly/stupid/mean... person
  Therefore, B is false.

- Examples:
  - 1. President Obama's drug enforcement efforts just won't work. He has admitted that he smoked marijuana in high school and college.
  - More?

Deductive Fallacies: 1. Ad Hominem

- Why does this look like a deductive fallacy?
- Could reframe as follows:
  Person A says that B is true.
  Person A is a bad person.
  ←**What goes here?**
  Therefore, B is false.
- **There's a hidden premise here (and in many of the other fallacies we consider). Here, what is it?**

Deductive Fallacies: 1. Ad Hominem

- Like most heuristics, this fallacy/shortcut "works" sometimes; the following is a pretty strong inductive argument:
  Person A says that B is true.
  Person A is a really bad person.
  Really bad people are, compared to good people, more likely to be wrong (because they lie, get their facts wrong, support evil things, etc.).
  Therefore, B is likely to be false.

- **What makes an Ad Hominem argument a deductive fallacy?**

Deductive Fallacies: 1. Ad hominem

- **Converse/Opposite of Ad Hominem** (Praise the Person)
  - Prove the conclusion of a person's argument by praising the person's character, looks, etc.
  - Basic structure of Converse-Ad Hominem fallacy.

    A argues that B is true.

    A is a good/smart/friendly... person.

    Therefore, B is true.

    What's the hidden (false) premise?
- Examples:
  - 1. "Dr. Bart is an easy grader and very nice. His teaching style will work best."
  - 2. Dennis Adams...

Deductive Fallacies: 2. Genetic

Genetic Fallacy

- If we can find some reason why the person might have made the claim (its origin or **genesis**) OTHER THAN its truth, we can dismiss the claim as false
- Reframed as a deductive argument:
  - Person A says that B is true.
  - Person A has some other (maybe ulterior) motive for saying B is true besides the truth of the statement.
  - Therefore, B is false.

Hidden premise?

- Examples:
  - 1. Accused on the 6 o'clock news of corruption and taking bribes, the senator said that we should all be very wary of the things we hear in the media, because we all know how very unreliable the media can be.
  - 2. 

  - 3.Dennis Adams...

Deductive Fallacies: 2. Genetic

Converse of Genetic Fallacy

- If we cannot find some reason why the person might have made the claim OTHER THAN its truth, we must accept the claim as true
- Reframed as a deductive argument:
  - Person A says that B is true.
  - Person A has no other apparent motive for saying B is true besides the truth of the statement.
  - Therefore, B is true.

Hidden premise?

- Examples:
  - 1. "LeBron James's contract with Gatorade has lapsed so he no longer is paid to say that it makes him a better athlete. Still, he says it really helps an athlete. So, it really must work."
  - 2. Dennis Adams...

Deductive Fallacies: 3. Appeal to (Questionable) Authority

- A says that P is true, therefore P is true (A should know because she's an **authority** on the subject)
- Converse: A says that P is true, therefore P is false (because A is **not** an authority)

Hidden premise?

A says that B is true.

A is an authority/expert/credentialed person.

Therefore, B is true.

What's the less extreme premise that underlies the value of the heuristic?

Deductive Fallacies: 3. Appeal to (Questionable) Authority

- Is it a fallacy to rely on authorities (like one's doctor)?
  - not if one doesn't assume that they MUST always be right AND
  - not if they are genuine experts
- Variation 1: If it's in print (or on the Internet), it must be true.
- Variation 2: If it is backed up with statistics, it must be true.
- Examples: 1. Political endorsements.
- 2. Hillary Clinton spoke about the retroactive classification of more than 2,000 emails she sent on her personal server while Secretary of State. "Colin Powell summed it up well," she told host John Dickerson. "He was told that some of his emails from more than 10 years ago were going to be retroactively classified, and he called it 'an absurdity.'" (*Face the Nation* – March 6th, 2016)
- Dennis Adams…

Deductive Fallacies: 4. Bandwagon

- Everyone does it, so it must be ok. **OR**
- Everyone believes it, so it must be true.
- Variation: That's common sense, so it must be true.
  - Converse: That's counterintuitive, so it must be wrong.

- **Hidden (false) premise?**

Everyone believes that B is true.

Therefore, B is true.

Deductive Fallacies: 4. Bandwagon

- What valid premises underlies the use of this heuristic?
  - Generally speaking, the more people that believe something, the more likely it is to be correct. (consensus heuristic; S. Chaiken)
  - For many questions, where there is no objective basis for deciding truth, we must rely on social consensus to validate positions (social comparison theory, Festinger, 1954)
  - Plus, taking an unpopular position (being a deviant) leads to social disapproval or rejection (Schachter, 1951; Levine, 1981)
- Examples:
  - 1. 1492 conversation: "Columbus, you're crazy. Everyone knows the world is flat."
  - 2. Teenager logic. "It's OK to go to the Kanye West concert. All my friends are going."
  - 3. Social proof (R. Cialdini, 1984). E.g.,
    - Owners of new discos hiring people to stand in line outside their door.
    - Claques at operas
  - 4. Dennis Adams…

Deductive Fallacies: 5. Past Practice (Tradition / Appeal to Traditional Wisdom)

- This has been going on for a very long time, so it must be true/valid/useful.
  - Consistency in time (vs. consistency across people for the Bandwagon fallacy)
- **Hidden (false) premise?**

People have believed that B is true for a long time.

Therefore, B is true.

- **What valid premises underlies the use of this heuristic?**

Deductive Fallacies: 6. Poisoning the Well

- By putting your opponent in a position where nothing they have to say can be valid, you prove your own position
  - "a drop of poison in the well will make it undrinkable for anyone"
  - a little like an Ad Hominem fallacy (Guilt by Association, or Circumstantial), except you're not attacking character, but credibility
- Examples:
  - 1. "The people who are advocating a national health program are all politicians, and you can't believe a word that any politician says."
  - 2. "No one who hasn't been the victim of discrimination can really understand what it is like. You're a White male, so your proposed anti-discrimination law won't work."
  - 3. "As someone who isn't a woman, nothing you have to say about women's illnesses is worth anything."

Deductive Fallacies: 7. Two wrongs make a right (or, "look who's talking")

- Proving one's own wrong position is correct by finding fault in an opposing position.
- **Hidden premise?**

Person A asserts one thing while Person B asserts another.
Person A points out some flaw in B's position.

Therefore, Person A is right.

- **The hidden premise is a _____**
- Example:
  - 1. 2 small children arguing: "You stink." "Oh yeah! Well, you really stink."
  - 2. (Paraphrase of exchange between two much older people: G. H. W. Bush vs. W. Clinton presidential debates)

    Clinton: "President Bush said, 'Read my lips: No new taxes'. Still, he recently raised Social Security taxes."

    Bush: "Look who's talking. When you were governor of Arkansas, you raised taxes over 30 times."

Deductive Fallacies: 8. Appeal to fear / force / emotions / scare tactic

- If you do not accept A as true, then something bad will happen to you. Therefore, A is true.
- If you do accept A as true, then something bad will happen to you. Therefore, A is false.
- Examples
  - 1. "I was taught that nonbelievers will go to a terrible hell, so I believe."
  - 2. "If you do not convict this criminal, one of you may be their next victim. "
  - 3. "They should not be punished because they are just a little child."

Many of the fallacies we'll consider look like deductive arguments; a few look like inductive arguments (https://web.cn.edu/kwheeler/fallacies_list.html)

Deductive arguments

Component Fallacies – Errors in deductive reasoning or in syllogistic terms that fail to overlap.

- False Dichotomy
- If I Feel It, It Must be True
- Begging the Questions
- Irrelevant Thesis / Conclusion
- Straw Man

Deductive Fallacies: 9. False dichotomy / Dilemma (Black-or-White)

- Fallacy: Either A or B is true, A is not true, therefore B is true.
  (when perhaps neither A or B might be true but C might be true, contrary to the initial premise)
- Examples:
  - 1. "Either classic Darwinian evolutionary theory or the Creationist theory of human origins is correct. Even modern biologists have concluded that Darwin's theory is very flawed. Therefore, the Creationist theory is proven correct."
  - 2. "Either you drink the Kool-aide, or you will have no friends and no social life."
  - 3. "Either we must ban X or the American way of life will collapse."
- This fallacy involves a process of elimination where the set of options is **not** exhaustive
- If A & B are truly a dichotomy, then it wouldn't be a fallacy
  - **Can you think of any such true dichotomies?**

Deductive Fallacies: 10. If I feel it, it must be true.

- If some assertion/event/person makes us feel good, then it must be true/safe/trusted.
- This fallacy is based on the following shaky argument:
  If something is safe/true, then I will feel good.
  I feel good.
  Therefore, that something is safe/true.
  - But the premise is false (sometimes we react negatively to true statements), and
  - even if it were true, the form of this argument is invalid (Affirming the Consequent).
- Examples:
  - "I feel good about my decision, so I can be sure that it was the right decision."
  - The business lunch.
    - People who are well fed feel good, and that may make them confident that any deal they made was a good one.
  - If the messenger (e.g., the person in an advertisement) makes me feel good (e.g., because they're attractive, flattering, familiar), then I'm more likely to accept the message

Deductive Fallacies: 10. If I feel it, it must be true/Converse.

- Variation: If a statement makes me feel bad, then it is false.
- Examples:
  - If we dislike the politician, we mistrust their speech
  - Lawyer folklore: Jurors are more likely to reject an attorney's summary speech before lunch (when they're hungry) than after
  - Do not rely on your ions as the sole barometer for distinguishing truths from falsehoods. There may be certainty in what you are feeling, just not in what it *"proves."*
    - (Levy, 1997, p. 217)

Deductive Fallacies: 11. Begging the question (Circular reasoning)

- The evidence is really not independent of the conclusion; e.g....
  - A is true because A is true. **OR**
  - A is true because B is true and B is true because A is true. **OR**
  - A is true because B is true and B is true because C is true and C is true because A is true.
- In each case, you end up right where you started (in a circle), without getting anywhere
- Examples:
  - 1. Parent: "It's late, you need to go to bed."
    Child: "Why?"
    Parent: "Because I say so."
    - i.e. I say you need to go to bed BECAUSE I say you need to go to bed.
  - 2. "It's clear that Dennis Adams is a healer because he can cure many diseases."
    - if a healer is **defined** as "someone who can cure diseases", then this becomes
    - he is someone who can cure diseases because he is someone who can cure diseases
  - 3. Mary: "Pregnant mothers should not take painkilling drugs during childbirth because a natural childbirth is best."
    Pam: "Why is a natural delivery best?"
    Mary: "Because you avoid filling your body up with all sorts of drugs."
- Some of this may be due to assuming that when someone says "...because...", some actual reason is following

Langer, Blank, & Chanowitz (1978)

- **3 request conditions (What were the results):**
  - Simple request: *"Excuse me, I have five pages. May I use the copy machine?"*
  - Nonredundant request: *"Excuse me, I have five pages. May I use the copy machine* ***because I am in a rush****?"*
  - Redundant request: *"Excuse me, I have five pages. May I use the copy machine* ***because I have to make copies****?"*
- Moral:
  - We may automatically and mindlessly assume that the "evidence" someone provides is independent/good evidence, even when it is not
  - **When the decision is important, though, we tend to rely less on such heuristics – What were the results below?**
    - Langer et al. also had a 25-pages condition. Now, it really cost (in time) to comply

Deductive Fallacies: 12. Irrelevant thesis (see Gray) / Irrelevant conclusion

- A is true, therefore B is true (but A is **irrelevant** to B).
- Actually, several previous fallacies feature particular irrelevant theses, e.g.
  - Ad hominem. Messenger's character is usually irrelevant to the truth of the message.
  - Bandwagon. Statement's popularity is often irrelevant to its truth

  Here, though, we are talking about all other, general instances of using an irrelevant thesis/premise
- Examples:
  - 1. "Governor Clinton says he would be the education president, but do you know that his state of Arkansas ranks 47th in the 50 states in education scores?"
    - **Is this rank relevant to Clinton's effectiveness on education?**
  - 2. "If there was a Big Bang, a moment of creation, then of course there has to be a Creator."
    - **But does the fact that something has a beginning mean that some sentient being created that something?**
  - 3. "The Nazi's instituted a national health plan. Part of that health plan was the euthanasia of 'undesirables', like mentally handicapped persons or Gypsies. Do we really want a national health system in the U.S.?"
  - 4. Dennis Adams...
  - **Red Herring?**

Deductive Fallacies: 13. Straw man

- Misrepresenting the position of someone (i.e., erecting a **straw man**) to make it easy to refute.
- **Hidden premise?**

  If X is true, than Y (your conclusion) must be false.

  But you also say that X is true.

  Therefore, your conclusion, Y, is false.

- Examples:
  - 1. "Evolutionary theory requires slow transitions from one species to another. But the fossil record sometimes shows quite rapid changes. Therefore, evolutionary theory has been disproved."
    - Darwin's original theory did make this assumption, BUT more recent versions of evolutionary theory have allowed quick transitions.
    - Also Equivocation: evolutionary theory ≠ just Darwin

Deductive Fallacies: 13. Straw man

- Misrepresenting the position of someone (i.e., erecting a **straw man**) to make it easy to refute.
- Examples:
  - 2. "Very strong gun control advocates may not get everything they want. And people who think they should have a missile launcher in their backyard as a Constitutional right may not have that."
    - Bernie Sanders (MSNBC's Democratic Presidential Candidates Forum)
  - 3. **Opposing argument:** Teens should be taught about contraception methods so they can practice safe sex should they choose to have intercourse.
  - **Straw man argument:** Proponents of sex education want to give kids license to have sex with no consequences.
  - 4. **Opposing argument:** We should put more money into health and education.
  - **Straw man argument:** I'm surprised you hate our country so much that you want to leave it defenseless by cutting military spending.

Many of the fallacies we'll consider look like deductive arguments; a few look like inductive arguments (https://web.cn.edu/kwheeler/fallacies_list.html)

Deductive arguments

Fallacies of Ambiguity – These errors occur with ambiguous words or phrases, the meanings of which shift and change in the course of discussion.

- Equivocation
- Composition Fallacy
- Division / Ecological Fallacy

Deductive Fallacies: 14. Equivocation.

- Using a single word or phrase with different meanings as if it only had one meaning, or changing definitions halfway through a discussion.
  - Exploits the multiple meanings of some words
- Examples:
  - 1. Pick-up lines
  - 2. http://www.nytimes.com/2016/02/16/us/politics/ted-cruz-ad-goes-after-donald-trumps-stance-on-planned-parenthood.html?_r=0
  - 3. Brad is a nobody, but since nobody is perfect, Brad must be perfect, too.
  - 3. Dennis Adams...

Deductive Fallacies: 15. Composition fallacy

- A is true of the part or parts, thus, A is true of the whole.
- Variant: What's true for one member of a group is true of the group as a whole
- Examples:
  - 1. "My startup will be efficient and successful, because I and everyone I have hired are efficient and successful."
  - 2. "Since Osama Bin Laden wanted to kill Americans, it stands to reason that Muslims generally want to kill Americans."
  - 3. "Each human cell is very lightweight, so a human being composed of cells is also very lightweight."

Deductive Fallacies: 16. Division/Ecological fallacy (converse of composition fallacy)

- A is true of the whole, thus, A is true of any of its parts
- Variant: What is true for the group as a whole or on average is true for every member
  - example: Group Attribution Error: draw strong inference about group member dispositions from collective group action without considering situational factors that may determine group action,
  - e.g., County A, 60% vote for school bond (67% required), failed
    County B, 60% vote for school bond (50% required), passed
    In which county is support for education stronger?
- Variant (Ecological fallacy): Relationships or differences at the group/average level insure comparable effects at the individual level

Examples of Division/Ecological Fallacy

- 1. Bill lives in a large building, so his apartment must be large.
- 2. Catholics in general are less likely to commit suicide ➔ Harold, who is not Catholic is more suicidal than Steve, a Catholic.
- 3. Applying a stereotype
  Men on average are taller than Women.
  Therefore, in any man-woman couple, the man will be taller.
- 4. "We're all part of God, therefore we should be able to heal, too."
  - earlier, we used this as an example of an "Irrelevant thesis"
  - again, note that many arguments, like this one, could be classified as more than one type of fallacy

Many of the fallacies we'll consider look like deductive arguments; a few look like inductive arguments (https://web.cn.edu/kwheeler/fallacies_list.html)

Deductive arguments

Fallacies of Omission – These errors occur because the logician leaves out necessary material in an argument or misdirects others from missing information.

- Appeal to Ignorance
- Loaded Question

Deductive Fallacies: 17. Appeal to Ignorance

Appeal to Ignorance

- If P has never been proved true (i.e., we lack proof, or are **ignorant**), then P must be false.
- The absence of evidence is taken as evidence.

Hidden premise?

There is no (or no conclusive) evidence that B is true.

Therefore, B is false.

Converse to Appeal to ignorance

- If P has never been proved false, then P must be true.

- Examples:
  - 1. "I'm sure that there is life after death. Where's the proof that there isn't?"
  - 2. "Evolutionary theory predicts that there should be 'transitional' species between early ancestors and modern man. But there are gaps in the fossil record between hominid species (there are 'missing links'). Absent such evidence, evolutionary theory must be wrong."

Deductive Fallacies: 18. Loaded question (see Gray)

- A question with an embedded assumption so that any answer indicates agreement with the assumption, too.
- Simply by asking the question, you imply an answer.

- Examples:
  - 1. Classic: Have you stopped beating your pet?
    - If you answer "No", implication is that you have and are still beating your pet.
    - If you answer "Yes", implication is that you used to, but no longer beat your pet.
    - No matter how you answer, the implication is that you previously beat your pet.
  - 2. "Are you still wasting your life in that same dead end job?"
  - 3. "Aren't you ever going to do something about improving your life?"

Inductive Fallacies

- A few serious fallacies occur for inductive rather than deductive arguments.
- For example:
  - **Faulty analogy** (Falls under Component Fallacies)
    - Things that resemble one another in certain respects must also resemble one another in other respects
    - e.g., "Saturn's moon Titan has lakes and shorelines like Earth. Therefore, it will also have life like Earth"
  - **Hasty generalization** (Falls under Component Fallacies)
    - On the basis of evidence on a few, particular cases, one draws a more general conclusion
    - e.g., "I ate a mushroom from that field just now and don't feel sick. So, I think it's safe to eat as many as I like."
  - **False cause** (*post hoc, ergo propter hoc* ; Falls under Component Fallacies)
    - If A is associated with B (i.e., if there is a relationship between A and B), then A causes B
      - Establishing a cause/effect relationship that does not exist
    - e.g., "A black cat crossed my path at noon. An hour later, my mother had a heart-attack. Because the first event occurred earlier, it must have caused the bad luck later."

Other judgmental fallacies, biases, errors, and heuristics

- **Nominal fallacy:** Naming something doesn't explain it.
- **Consequence-Intentionality fallacy:** The effect does not prove an intent to produce that effect
- **Confirmation bias (Internet Encyclopedia of Philosophy):** Tendency to look for evidence that would confirm what one believes to be true.
- **Reification error (Internet Encyclopedia of Philosophy):** Treating an abstract concept (e.g., self esteem) as if it were a concrete or physical entity
- **Fundamental Attribution Error:** A tendency when explaining others' behavior to pay too little attention to situational factors (e.g., the situation the person is in; what others are doing) and too much to internal factors (e.g., personality).
  - https://www.youtube.com/watch?v=HR_q96-YRzk
- **Hindsight bias:** Tendency to overestimate how predictable something is after one learns that it has occurred.
  - http://www.psychologicalscience.org/index.php/news/releases/i-knew-it-all-along-didnt-i-understanding-hindsight-bias.html