

EE459/EE439

Logical Fallacies

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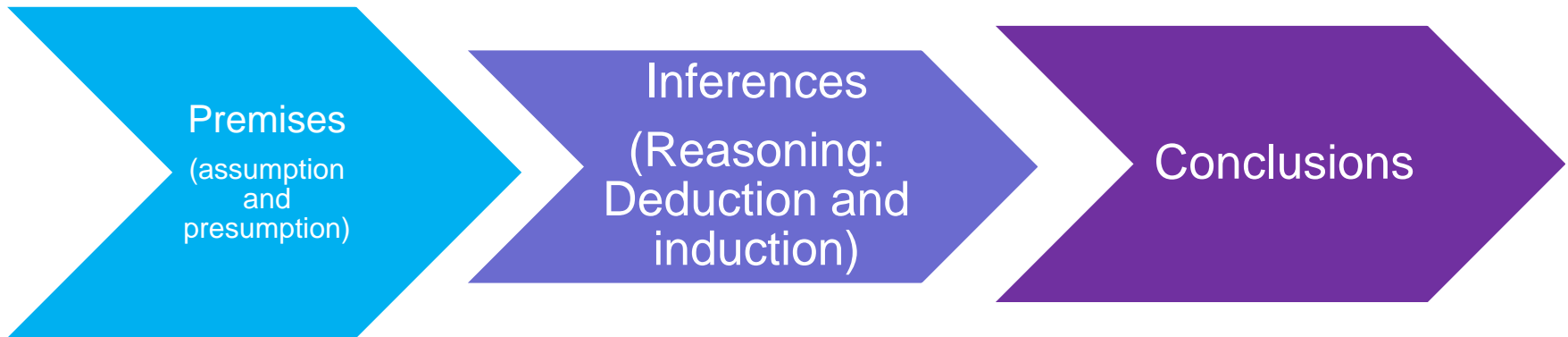
Source: An Encyclopedia of Errors of Reasoning

**Making logical conclusions from your
research**

Beware of Logical Fallacies

- The ability to identify logical fallacies in the arguments of others, and to avoid them in one's own arguments, is both valuable and increasingly rare.
- ***Fallacious reasoning keeps us from knowing the truth, and the inability to think critically makes us vulnerable to manipulation by those skilled in the art of rhetoric.***

Components of arguments



Presumption: The acceptance of something as true although it is not known for certain
An idea that is taken to be true on the basis of probability

Induction: The inference to form a general law from particular instances (specific to general)

Deduction: *reasoning from general conclusions or theories to predictions and explanations.*

A conclusion is reached on the basis of evidence and reasoning

Components of Arguments: premises, inferences, and conclusions

- Arguments containing bad inferences, where the premises don't give adequate support for the conclusion drawn, can certainly be called fallacious.
- Some arguments containing false premises but their inferences and conclusions are fine

Taxonomy of Fallacies: Common Fallacies

- (a) Ambiguity: Arguments that *manipulate language in misleading ways*
- (b) Wrong presumption
- (c) Irrelevance

Strawman Arguments: Fallacy of ambiguity *manipulative language in misleading ways*

- A straw man argument is one that misrepresents a real position in order to make it **appear weaker** than it actually is, refutes this (straw man) misrepresentation of the position, and then concludes that the real position has been refuted.
- This is a fallacy, because the position that has been claimed to be refuted is different to that which has actually been refuted; the real target of the argument is untouched by it.

The Gambler's Fallacy

- The gambler's fallacy is the fallacy of assuming that short-term deviations from probability ***will be corrected in the near future***. (Betting on a certain number of lotteries).
- Faced with a series of events that are statistically unlikely, say, a series of 9 coin tosses that have landed **heads-up**, it is very tempting to expect the next coin toss to land **tails-up** (*a correction from the previous deviation*)
- The past series of results has no effect on the probability of the various possible outcomes of the next coin toss.
- **The stock prices are going down, I bet that it would go up soon.**
- *I suggest we buy stocks today because we can make profit by selling them later at higher prices.*

Short selling

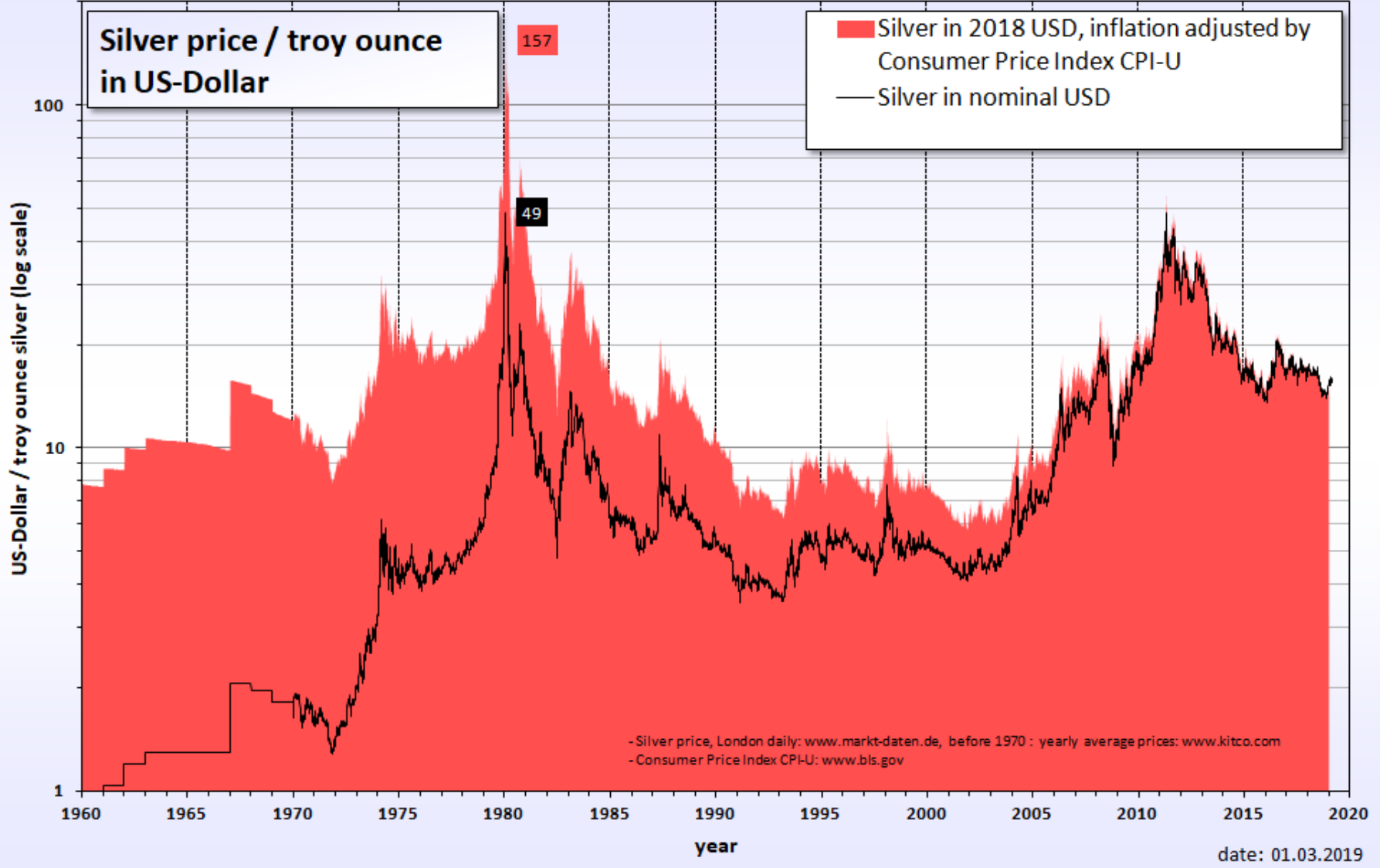
- Short selling occurs when an investor borrows a security and sells it on the open market, planning to buy it back later for less money.
- Short sellers bet on, and profit from, a drop in a security's price.
- Short selling has a high risk/reward ratio: It can offer big profits, but losses can mount quickly and infinitely.

Sumitomo copper affair

- A metal trading scandal in 1995 involving Yasuo Hamanaka, the chief copper trader of the Japanese trading house Sumitomo Corporation.
- Sumitomo lost at least *\$1.8 billion* as a result of what it said were unauthorized trades over a 10-year period by Hamanaka.

Silver Thursday: 27 March 1980

- Historical silver price in USD and inflation adjusted silver price in USD shown in the chart.
- Silver Thursday event as a peak in 1980 when Hunt brothers drove up the price of silver through speculations and after it, they lost about a billion dollars.
- It currently ranks in the top 10 trading losses in financial history.



Fallacies of Presumption

A false assumption

- Fallacies of presumption *are not errors of reasoning* in the sense of logical errors, but are nevertheless commonly classed as fallacies.
- Fallacies of presumption begin with a **false** (or at least unwarranted) assumption, and so fail to establish their conclusion.

Unwarranted presumptions (assumptions)

- Fallacies of presumption involve ***false dilemmas, complex questions, or circularity***. All commit fallacies of presumption:
- **false dilemmas** assume that there are ***no other options*** to consider;
- **complex questions** assume that a state of affairs holds when it may not;
- **circular arguments** assume precisely the thing that they seek to prove.
- In each case, the assumption is problematic, and prevents the argument from establishing its conclusion.

Circular Reasoning Begging the Question (Assume what it is trying to prove)

- An argument is circular if its conclusion is among its premises, if it assumes (either explicitly or not) what it is trying to prove.
- Such arguments are said to beg the question.
- A circular argument fails as a proof because it will only be judged to be sound by those who already accept its conclusion.

Begging the question

Assuming what it is trying to prove

- Typical examples of **circular arguments** include rights-claims: e.g.,
- “Thammasat has freedom in every square inch, I have a right to wear what I want, therefore you shouldn’t try to tell me how to dress properly”;
- “Women have a right to choose whether to have an abortion or not, therefore abortion should be allowed”;
- “The unborn has a right to life, therefore abortion is immoral”.
- Having a right to X is the same as other people having an obligation to allow you to have X, so each of these arguments begs the question, assuming exactly what it is trying to prove.

Fallacies of Relevance (Irrelevance)

- Fallacies of relevance are attempts to prove a conclusion by offering considerations that simply don't bear on its truth.
- In order to prove that a conclusion is true, one must offer evidence that supports it (inferences).
- ***Arguments that commit fallacies of relevance don't offer evidence to support its argument***
- The ***considerations that they offer in support of their conclusion are irrelevant*** to determining whether that their conclusion is true.
- The considerations offered are usually **psychologically powerful**, however, even if they don't have any evidential value.

Fallacies of Relevance

A. Personal attacks (arguments ad hominem) attempt to discredit a point of view by discrediting the person that holds it.

- The character of the person that holds a view, though, ***entails nothing about the truth of that view.***
- Such arguments therefore commit a fallacy of relevance.

Fallacies of Relevance

B. Appeals to consequences attempt to persuade someone to accept a position based either on the good consequences of their accepting it or on the bad consequences of their not accepting it.

- There is no guarantee, though, that the position that has the best consequences is true.
- Again, then, such arguments commit a fallacy of relevance.

Appeal to Consequences

- An appeal to consequences is an attempt to motivate belief with an appeal either to the good consequences of believing or the bad consequences of disbelieving.
- Such arguments are clearly fallacious.
- There is no guarantee, or even likelihood, that the world is the way that it is best for us for it to be.
- Belief that the world is the way that it is best for us for it to be, absent other evidence, is therefore just as likely to be false as true.

Appeal to Consequences

- An appeal to consequences seeks to persuade by getting the listener to consider either the attractiveness of a belief, or the unattractiveness of the alternatives.
- We should form beliefs, however, not on the basis of what we would like to be true, but ***on the basis of what the evidence supports.***

Appeal to bad/good consequences

- Without the intervention, the baht/\$ would have been strengthened to 29 baht, weakening the economic growth in 2020.
- “Early to bed, and early to rise make you healthy, wealthy, and wise”

Irrelevant Appeals: Emotion Based argument

- An appeal to pity, which can be very effective, persuades *using emotion--* specifically, sympathy--rather than reason.
- “As the poor suffer miserably from inflation, the government should set price ceilings for essential consumer goods”

Appeal to pity

- An appeal to pity attempts to persuade using emotion--specifically, sympathy--rather than evidence.
- Playing on the pity that someone feels for an individual or group can certainly affect what that person thinks about the group; this is a highly effective, and so quite common, fallacy.

Appeal to Pity

- This type of argument is fallacious because our emotional responses are not always a good guide to truth; emotions can cloud, rather than clarify, issues.
- We should base our beliefs upon reason, rather than on emotion, if we want our beliefs to be true.
- ***Thailand's economic development is a disaster as the rich get richer and the poor become poorer.***
- ***When tuition fee is raised, it should be applied for new students only, otherwise parents of previously enrolled students would be adversely affected.***

Irrelevant appeal: Appeal to Authority (or Experts)

- An appeal to authority is an argument from the fact that a person judged to be an ***authority*** ***affirms a proposition to the claim that the proposition is true.***
- Appeals to authority are always deductively fallacious; even a legitimate authority speaking on his area of expertise may affirm a falsehood, so no testimony of any authority is guaranteed to be true.
- “*According to Minister of labor, Thailand unemployment rate dropped to 0.7 %, its lowest level in the decade*”.

Appeal to authority: limited relevance to the claim

- It seeks to persuade by citing what someone else, a perceived authority, thinks on the subject, as if that resolves the question.
- The degree of support that such an appeal lends to a claim varies depending on the particular authority in question,
- The relevance of their expertise to the claim, and other factors, but in all cases is limited.

Appeal to Authority

- However, the informal fallacy occurs only when the authority cited either (a) is not an authority, or (b) is not an authority on the subject on which he is being cited.
- If someone either isn't an authority at all, or isn't an authority on the subject about which they're speaking, then that ***undermines*** the value of their testimony.

Appeal to Force

- An appeal to force is an attempt to persuade using threats. Its Latin name, “argumentum ad baculum”, literally means “argument with a big stick”.
- Disbelief, such arguments go, will be met with sanctions, perhaps physical abuse; therefore, you’d better believe.
- Appeals to force are thus a particularly cynical type of appeal to consequences, where the unpleasant consequences of disbelief are deliberately inflicted by the arguer.

Weak Analogy

- Arguments by analogy rest on a comparison. Their logical structure is this:
 - (1) A and B are similar.
 - (2) A has a certain characteristic.Therefore:
 - (3) B must have that characteristic too

“Thailand needs to have three submarines like Singapore.”

Weak Analogy

- “Israel is successful in diverting water from its river for its agriculture”.
- “Thailand should build a tunnel to divert water from Mekong river to the Northeastern region”.
- An argument by analogy is only ***as strong as the comparison*** on which it rests.
- The weak analogy fallacy (or “false analogy”, or “questionable analogy”) is committed when the comparison is not strong enough.

Red Herring: A debate tactic

- The red herring is as much a debate tactic as it is a logical fallacy.
- It is **a fallacy of distraction**, and is committed when a listener attempts to divert an arguer from his argument by introducing another topic.
- This can be one of the most frustrating, and effective, fallacies to observe.
- The fallacy gets its name from fox hunting, specifically from the practice of using smoked herrings, which are red, to **distract** hounds from the scent of the foxes.
- Just as a hound may be prevented from catching a fox by distracting it with a red herring, so an arguer may be prevented from proving his point by distracting him with a tangential issue.

An Appeal to Pity

- An appeal to pity, for example, can be used to distract from the issue at hand:
- “You may think that he cheated on the final exam, but look at the poor student! How would he feel if archon gave him get an F?”

Moralistic Fallacy

- It ***assumes*** that the world is as it should be. This, sadly, is a fallacy; sometimes things aren't as they ought to be.
- Sometimes things aren't as they ought to be.

The Moralistic Fallacy

- Have you ever crossed a one-way street without looking in both directions? If you have, reasoning that **people shouldn't be driving the wrong way up a one way street** so there's no risk of being run over from that direction, then you've committed the moralistic fallacy.
- Because sometimes people drive in directions that they shouldn't.
- The rules of the road don't necessarily describe actual driving practices: so we must expect the unexpected.

Bandwagon Fallacy

- The bandwagon fallacy is committed by arguments that appeal to the **growing popularity** of an idea as a reason for accepting it as true.
- They take the mere fact that an idea suddenly attracting adherents as a reason for us to join in with the trend and become adherents of the idea ourselves.
- This is a fallacy because there are many other features of ideas than truth that can lead to a rapid increase in popularity.
- **Peer pressure, tangible benefits, or even mass stupidity could lead to a false idea being adopted by lots of people.**
- **A rise in the popularity of an idea, then, is no guarantee of its truth.**

Bandwagon Fallacy

- The bandwagon fallacy is closely related to the appeal to popularity; the difference between the two is that the bandwagon fallacy places an emphasis on current fads and trends, on the growing support for an idea, whereas the appeal to popularity does not.
- ***“Inflation target is a must after adopting a flexible exchange rate system.”***
- ***Iphone 12 is a must for smart students.***

Post Hoc Ergo Propter Hoc

- The Latin phrase “post hoc ergo propter hoc” means, literally, “**after this therefore because of this.**”
- The post hoc fallacy is committed when it is assumed that because one thing occurred after another, it must have occurred as a result of it.
- Mere temporal **succession**, however, does not entail causal succession.
- *Just because one thing follows another does not mean that it was caused by it.*
- *Granger causality test isn't really a causality test*
Hence, an adjective “Granger”

Post Hoc, Ergo Propter Hoc After this, therefore because of this

- This argument commits the post hoc fallacy because it infers a ***causal connection*** based solely on temporal order.
- **Superstitions** often arise from people committing the *post hoc fallacy*.

Post Hoc, Ergo Propter Hoc

- Consider, for example, a student who adopts a pre-exam ritual because she prayed to Dr. Puey Statute before the exam, she got an A in EE460.
- The reasoning here is presumably that on the first occasion the activity preceded the success, so the activity must have contributed to the success, so repeating the activity is likely to lead to a recurrence of the success.
- *Change your name and your life would strike a fortune.*

Midlife Impacts of Graduating in a Recession

- Socioeconomic Decline and Death: Midlife Impacts of Graduating in a Recession
- Hannes Schwandt, Till M. von Wachter
- NBER Working Paper No. 26638
- Issued in January 2020
- This paper uses several large cross-sectional data sources and a new approach to estimate midlife effects of entering the labor market in a recession on mortality by cause and various measures of socioeconomic status. We find that cohorts coming of age during the deep recession of the early 1980s suffer increases in mortality that appear in their late 30s and further strengthen through age 50.

NBER Program on the Economics of Aging, Health Economics Program, Labor Studies Program

- We show these mortality impacts are driven by disease-related causes such as heart disease, lung cancer, and liver disease, as well as drug overdoses.
- At the same time, unlucky middle-aged labor market entrants earn less and work more while receiving less welfare support.
- They are also less likely to be married, more likely to be divorced, and experience higher rates of childlessness. Our findings demonstrate that temporary disadvantages in the labor market during young adulthood can have substantial impacts on lifetime outcomes, can affect life and death in middle age, and go beyond the transitory initial career effects typically studied.

Cum Hoc, Ergo Propter Hoc

- The cum hoc fallacy is committed when it is assumed that because two things **occur together**, they must be causally related. This, however, does not follow;
- ***Correlation is possible without causation***
- If the graph shows the declining value of the baht and rising export growth, one should not jump into the conclusion that weak currency lead to strong export growth.
- *iPhone popularity and the increasing crime rate in the US. (Urban Research Institute)*
- *Suicide rate and unemployment rate are correlated.*

Argument from Ignorance

- Arguments from ignorance infer that a proposition is true from the fact that ***it is not yet known to be false.***
- Not all arguments of this form are fallacious; if it is known that if the proposition were not true then it would have been disproved, then a valid argument from ignorance may be constructed.
- In other cases, though, arguments from ignorance are fallacious.
- ***“If the Finance Minister knew about baht speculation, he would be frightened and would maintain the capital controls,” said a monetary authority in January 2007(August 2017).***
- ***“If you don’t believe, never show your contempt”***

'Widow's ghost' again blamed for deaths

Bangkok Post, January 20, 2020



A proposition is true from because *it is not yet known to be false.*

- NAKHON RATCHASIMA: Following the deaths of 13 people in the past three months, residents of Ban Tha Luang village in Phimai district of this northeastern province have hung red shirts in front of their houses, believing they could prevent them from being attacked by a widow's ghost.
- Since most of those who died between November and January, aged 17-60, were men, the residents believe the ghost of a widow took their lives.
- The most recent death was that of Boon-uan Baebphimai, 60, a villager in Ban Tha Luang said to be strong and healthy. He was found lying unconscious one day on a village road and died shortly afterwards.

Argument from Ignorance

- The villagers believe a red shirt hung in front of their houses could prevent members of their families from being attacked by the ghost.
- The practice has been reported at several villages in the Northeast where a similar pattern of deaths occurred.

Bandwagon Fallacy

- A spirit medium hired by the villagers said the "widow ghost", or *pee mae mai*, also known locally as the *lai thai* (sudden unexpected death syndrome) spirit, was responsible for their demise.
- *The medium* also told villagers to hang a red shirt outside their homes to repel the evil spirit and also warned that families with only one son have a higher chance of a visit from the ghost.

To ward off Pee Mae Mai



Hasty Generalization

- A hasty generalization draws a general rule from a single, perhaps atypical, case.
- (1) BE students **in** my EE 460 class are very polite.
- (2) **All** BA students in the Econ faculty have good manner and they are all polite.
- This argument takes an individual case and draws a general rule from it, assuming that all BE students are like my EE460 students.

Sweeping Generalization

- A sweeping generalization applies a general statement too broadly.
- If one takes **a general rule, and applies it to a case** to which, due to the specific features of the case, the rule does not apply, then one commits the sweeping generalization fallacy.
- This fallacy is the reverse of a hasty generalization, which infers a general rule from a specific case.
- (1) Many developed countries have a free education system.
(2) Thai government should provide free education to all.
- No matter what you think of the general principle that a country should provide, good education to the needy, Thailand can improve education by other means; the general principle doesn't apply.

Slippery Slope

- Slippery slope arguments falsely assume that one thing must lead to another.
- They begin by suggesting that if we do one thing then that will lead to another, and before we know it we'll be doing something that we don't want to do.
- They conclude that we therefore shouldn't do the first thing.
- The problem with these arguments is that it is possible to do the first thing that they mention ***without going*** on to do the other things; restraint is possible.
- ***If you start smoking when you are young, you would end up becoming a drug addict when you grow up.***

Tu Quoque: Two Wrongs don't make one right

- Chula's English language program has increased the tuition fee by 15% this year.
- MU and KU colleges also charge more than TU programs, therefore the BE program should increase tuition fee.”
- This commits the tu quoque fallacy because it's quite possible that all schools have overcharged their students.

Try to recognize our follies and avoid them

- **Confirmation bias** (our *tendency to reaffirm our beliefs* rather than contradict them),
- **Narrative fallacy** (our weakness to believe in compelling stories),
- **Silent evidence** (our *failure to account for what we don't see: factor Z*),
- **Lucid fallacy** (our willingness to *oversimplify and take models too seriously*),
- **Epistemic arrogance** (our habit of *overestimating our knowledge* and underestimating our ignorance).