



Logical Fallacies

Common Mistakes in Reasoning



Fallacy

- ◆ A fallacy is an error in reasoning.
- ◆ Some fallacies are so common that they have names of their own.
- ◆ This workshop will examine the most common fallacies, but be aware that there are many more mistakes in reasoning than can be covered in this workshop.



Ad Hominem

- ◆ Ad hominem means, literally, “to the man”.
- ◆ Ad hominem occurs when, instead of attacking a person’s position or argument, the arguer instead attacks the person on irrelevant grounds. It is the attempt to discredit an idea or proposition by pointing to some flaw or fault in the behavior or character of the person who is the source of the idea or proposition.



Ad Hominem

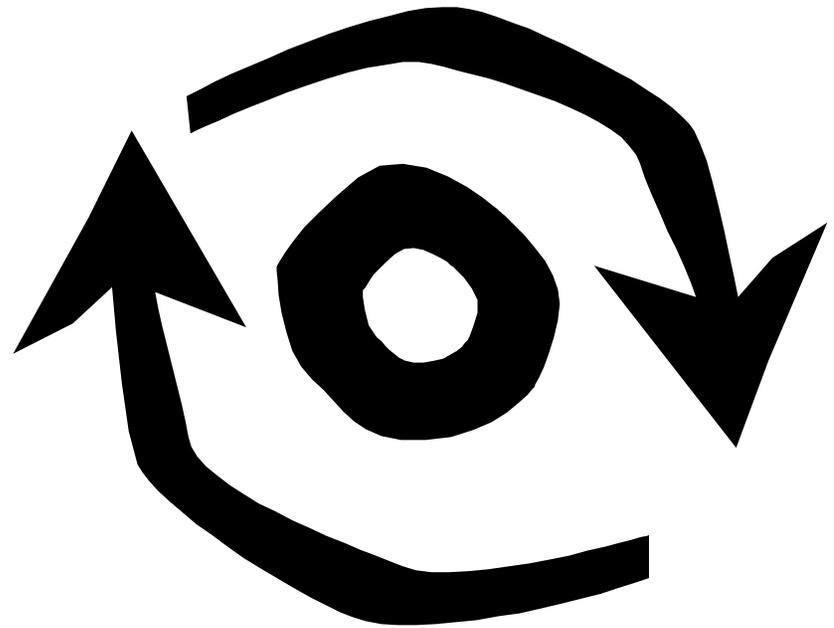
- ◆ There are three major forms of Attacking the Person:
- ◆ (1) ad hominem (abusive): instead of attacking an assertion, the argument attacks the person who made the assertion.
- ◆ (2) ad hominem (circumstantial): instead of attacking an assertion the author points to the relationship between the person making the assertion and the person's circumstances.
- ◆ (3) ad hominem (tu quoque): this form of attack on the person notes that a person does not practise what he preaches.

Ad Hominem

- ◆ (i) You may argue that God doesn't exist, but you are just following a fad. (ad hominem abusive)
- ◆ (ii) We should discount what Premier Klein says about taxation because he won't be hurt by the increase. (ad hominem circumstantial)
- ◆ (iii) We should disregard Share B.C.'s argument because they are being funded by the logging industry. (ad hominem circumstantial)
- ◆ (iv) You say I shouldn't drink, but you haven't been sober for more than a year. (ad hominem tu quoque)

Affirming the Consequent

- ◆ If you assert a hypothetical proposition and you also assert the consequent of that hypothetical, and think that these two assertions prove the conclusion, you commit the fallacy of affirming the consequent.
- ◆ **Definition: Any argument of the following form is invalid:**
If A then B
B
Therefore, A





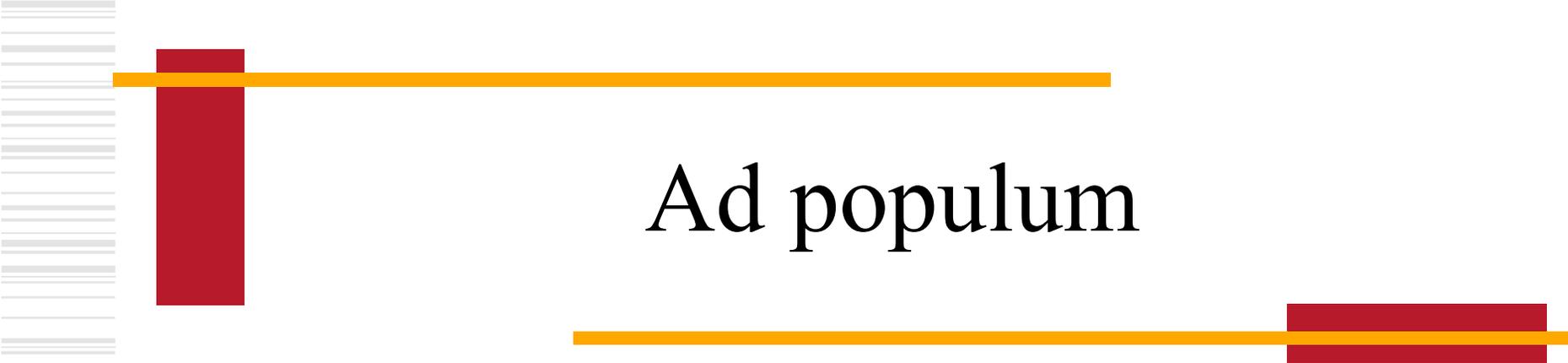
Affirming the Consequent

- ◆ **Examples:**
- ◆ If I am in Calgary, then I am in Alberta. I am in Alberta, thus, I am in Calgary. (Of course, even though the premises are true, I might be in Edmonton, Alberta.)
- ◆ If the mill were polluting the river then we would see an increase in fish deaths. And fish deaths have increased. Thus, the mill is polluting the river.

Ad populum

- ◆ The arguer appeal to the popularity of an idea or of an attitude as a justification.
- ◆ Note that voting and majority rule are not so much methods to establish a truth, as a decision procedure that it accepted because it is fair. Truth is not decided by a vote.





Ad populum

- ◆ If you were beautiful, you could live like this, so buy Buty-EZ and become beautiful. (Here, the appeal is to the “beautiful people”.)
- ◆ Polls suggest that the Liberals will form a majority government, so you may as well vote for them.
- ◆ Everyone knows that the Earth is flat, so why do you persist in your outlandish claims?



Appeal to Force

- ◆ The attempt to support a belief or proposition by threatening one who refuses to believe.
- ◆ The premise that someone is powerful does not warrant the conclusion that they are right.

Appeal to Force

- ◆ You had better agree that the new company policy is the best bet if you expect to keep your job.
- ◆ NAFTA is wrong, and if you don't vote against NAFTA then we will vote you out of office.





Appeal to Ignorance

- ◆ Arguments of this form assume that since something has not been proven false, it is therefore true.
- ◆ Conversely, such an argument may assume that since something has not been proven true, it is therefore false.



Appeal to Ignorance

- ◆ “Since you cannot prove that ghosts do not exist, they must exist”.
- ◆ “Since scientists cannot prove that global warming will occur, it probably won't”.
- ◆ “Fred said that he is smarter than Jill, but he didn't prove it, so it must be false”.



Appeal to Pity

- ◆ The reader is told to agree to the proposition because of the pitiful state of the author.
- ◆ “How can you say that's out? It was so close, and besides, I'm down ten games to two.”
- ◆ “We hope you'll accept our recommendations. We spent the last three months working extra time on it.”



Appeal to Tradition

- ◆ The attempt to support a belief by pointing out that it has a long history behind it.
- ◆ “What was good enough for our forebears ought to be good enough for us”. Really? Couldn't times has changed in relevant ways, giving us good grounds to put tradition aside?



Begging the Question

- ◆ This fallacy occurs when, instead of giving a reason that establishes the conclusion, the conclusion is simply assumed. The premise is just another way of stating what is supposed to be proved.



Begging the Question

- ◆ “Since I'm not lying, it follows that I'm telling the truth.”
- ◆ “We know that God exists, since the Bible says God exists. What the Bible says must be true, since God wrote it and God never lies.” (Here, we must agree that God exists in order to believe that God wrote the Bible.)

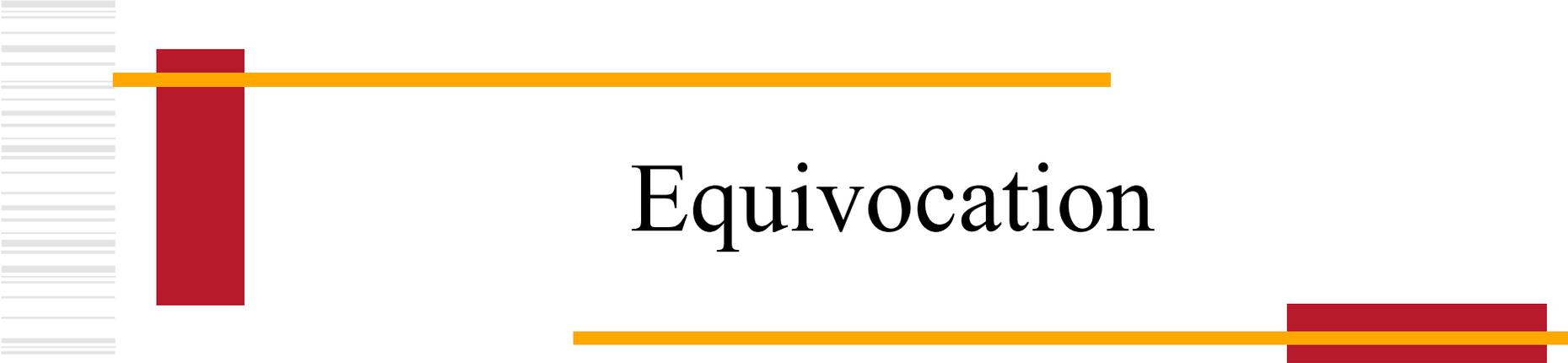
Denying the Antecedent

- ◆ If you assert a hypothetical proposition and deny the antecedent, and thus believe that these two premises prove the negation of the consequent, you commit the fallacy of denying the antecedent.
- ◆ **Any argument of the following form is invalid:**
If A then B
Not A
Therefore, Not B



Denying the Antecedent

- ◆ **Examples:**
- ◆ If you get hit by a car when you are six then you will die young. But you were not hit by a car when you were six. Thus you will not die young. (Of course, you could be hit by a train at age seven, in which case you still die young.)
- ◆ If I am in Calgary then I am in Alberta. I am not in Calgary, thus, I am not in Alberta.



Equivocation

- ◆ Sometimes an author equivocates between two different meanings of a word or phrase. When this happens, you should not accept the argument (since one of the premises will be false).

Equivocation

- ◆ Criminal actions are illegal, and all murder trials are criminal actions, thus all murder trials are illegal.
- ◆ The sign said "fine for parking here", and since it was fine, I parked there.
- ◆ All child-murderers are inhuman, thus, no child-murderer is human.
- ◆ A plane is a carpenter's tool, and the Boeing 737 is a plane, hence the Boeing 737 is a carpenter's tool.



Fallacy of Composition



- ◆ **Definition:** Because the parts of a whole have a certain property, it is argued that the whole has that property. That whole may be either an object composed of different parts, or it may be a collection or set of individual members.



Fallacy of Composition



- ◆ (i) The brick wall is six feet tall. Thus, the bricks in the wall are six feet tall.
- (ii) Germany is a militant country. Thus, each German is militant.
- (iii) Conventional bombs did more damage in W.W. II than nuclear bombs. Thus, a conventional bomb is more dangerous than a nuclear bomb.



Fallacy of Division

- ◆ Attributing to an individual a property of the class of which the individual is a member.
- ◆ EG, “All the richest people in town live upon the hill. Since Jones lives up on the hill, he must be one of the richest people in town”.



Fallacy of Division

- ◆ Each brick is three inches high, thus, the brick wall is three inches high.
- ◆ Because the brain is capable of consciousness, each neural cell in the brain must be capable of consciousness.



False Dichotomy/False Dilemma



- ◆ Giving a limited number of options when there are in fact more options available.
- ◆ EG, “Either you're for me or against me”.
- ◆ EG, “America: love it or leave it”.
- ◆ EG, “Every person is either wholly good or wholly evil”.



Loaded Questions

- ◆ Questions with unwarranted presuppositions.
- ◆ EG, “Have you stopped beating your wife yet?”



Post hoc, ergo propter hoc



- ◆ Literally, “after this, therefore because of this”.
- ◆ Committing this fallacy occurs when one confuses correlation with causation.



Post hoc, ergo propter hoc

- ◆ Immigration to Alberta from Ontario increased. Soon after, the welfare rolls increased. Therefore, the increased immigration caused the increased welfare rolls.
- ◆ I took EZ-No-Cold, and two days later, my cold disappeared.



Proof Surrogate



- ◆ The authority in question is not named and thus it is impossible to confirm that the authority is an expert.
- ◆ A variation on this fallacy is the appeal to rumour. Because the source of a rumour is typically not known, it is not possible to determine whether to believe the rumour. Very often false and harmful rumours are deliberately started in order to discredit an opponent.



Proof Surrogate

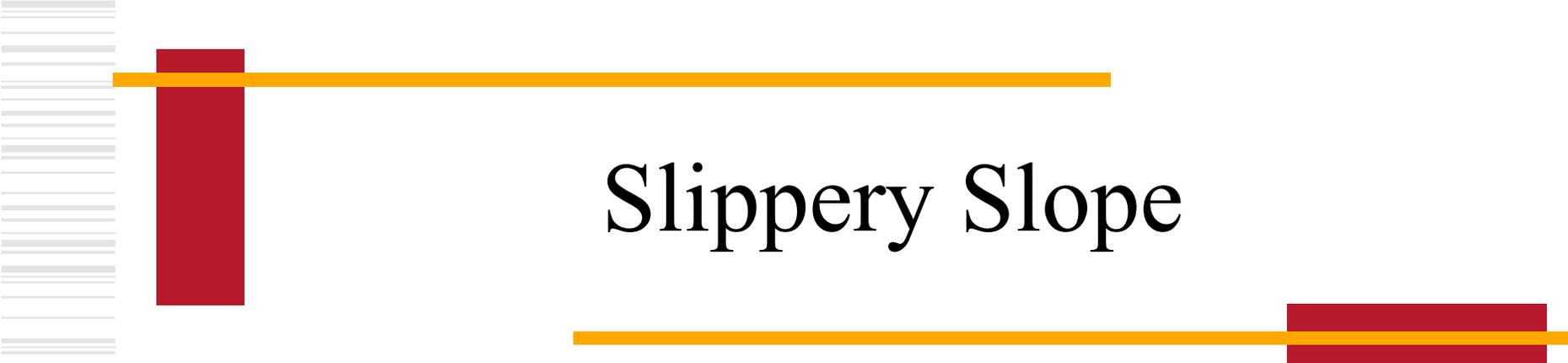
Examples:

- ◆ A government official said today that the new gun law will be proposed tomorrow.
- ◆ Experts agree that the best way to prevent nuclear war is to prepare for it.
- ◆ It is held that there are more than two million needless operations conducted every year.
- ◆ Rumor has it that the Prime Minister will declare another holiday in October.



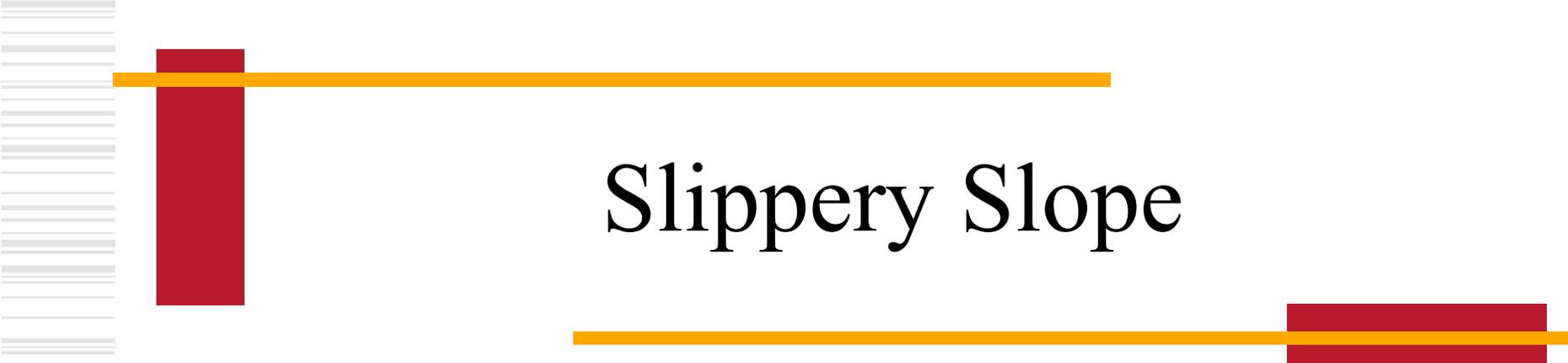
Red Herring

- ◆ Dogs on the trail of some prey can be thrown off scent if one rubs a red herring (a type of fish) across the trail.
- ◆ This fallacy consists of distracting someone's line of thought by inserting an attractive digression from the topic.
- ◆ “You think the problem of AIDS in Africa is serious, well, let me tell you about the problem of overpopulation there”.



Slippery Slope

- ◆ Objecting to taking a first step in a certain direction on the grounds that later steps will be irresistible and ruinous.
- ◆ EG, “If we legalize the right of doctors to assist their patients who want to die, it’s just a question of time before doctors will be killing their patients without bothering to get their consent”.



Slippery Slope

- ◆ If we pass laws against fully-automatic weapons, then it won't be long before we pass laws on all weapons, and then we will begin to restrict other rights, and finally we will end up living in a communist state. Thus, we should not ban fully-automatic weapons.

You should never gamble. Once you start gambling you find it hard to stop. Soon you are spending all your money on gambling, and eventually you will turn to crime to support your earnings.

If I make an exception for you then I have to make an exception for everyone.

Straw Man



- ◆ A maneuver in which one imputes to the opponent a thesis that is an exaggeration or misrepresentation of the opponent's real position, and thus easily knocked down (hence, metaphorically, a position made of straw).



Straw Man

- ◆ We should have conscription. People don't want to enter the military because they find it an inconvenience. But they should realize that there are more important things than convenience.