1 **Argumentation**

- Module: Philosophy
- Lesson 7

2 **What do we mean by "argument"?**
(Two meanings for the word.)

- An exchange of opposing or conflicting views, often heated or angry.
- A reason or set of reasons for or against an action or idea, given with the intent of persuasion.
  - (This second meaning is how we will use the term in this lesson.)

3 **Why do we need to think about argument?**

- To better evaluate and respond to the arguments which others present for their positions.
- To better asses the quality of the reasoning we give others for believing Christianity.
  - A well-reasoned argument enhances our persuasiveness and elevates people's perception of the reasonableness of Christianity.
  - A poorly reasoned argument undermines our case and defeats our objective of persuasion.
  - Poorly reasoned arguments can make people generally more skeptical towards the Christian faith.

4 **How do we reason?**
Three ways.

- Deductive reasoning:
- Reasons from a general rule to a specific conclusion. The conclusion is necessary from the premises that are given.
- Inductive reasoning:
- Reasons from a set of specific observations to a general rule. The conclusion is probable from the premises that are given.
- Abductive (or adductive) inference:
  - Infers past causes from presently observed effects, often based on known causes of similar effects. The conclusion is a probable or possible explanation for evidence or data. It seeks to discover the best possible explanation.

5 **1. Deductive Reasoning**

- Frequently argues from the general to the specific.
- ILLUSTRATION:
  - All men are mortal.
  - Socrates is a man.
  - Therefore, Socrates is mortal.
- Valid vs. invalid deductive arguments—

- For a deductive argument to be formally valid the conclusion must follow necessarily from the premises. (Given the premises, the conclusion is necessary.) Hence, if the premises are true, the conclusion is necessarily true.
- An formally invalid deductive argument is one in which the conclusion does not necessarily follow from the premises given.

6 **Deductive Reasoning**

- Sound vs. unsound deductive arguments
  - A deductive argument is sound if, and only if, it is both (1) valid and (2) all of its premises are true, otherwise it is said to be unsound.
- ILLUSTRATION of an invalid argument w/true premises and conclusion:
  - Premise: All popes live in the Vatican.
  - Premise: Francis lives in the Vatican.
  - Conclusion: Therefore Francis is the Pope.
  - The argument is invalid, and hence unsound, because the conclusion does not necessarily follow from the premises.

7 **Deductive Reasoning**

- ILLUSTRATION of a valid but unsound argument (one or more false premises):
  - Premise: Only the pope lives in the Vatican.
  - Premise: Francis lives in the Vatican.
  - Conclusion: Therefore Francis is the pope.
  - Though the conclusion follows necessarily from the premises (the argument is valid), one of the premises is false.

8 **Deductive Reasoning**

- What constitutes a sound (or good) deductive argument?
  - It is formally valid (in the foregoing sense).
  - It is also informally valid. It does not commit an informal logical fallacy. (More on informal logical fallacies next week.)
  - All the premises are true, or more plausibly true than false.
    - Premises need only be plausible, not certain, to constitute a good argument. If a premise is more plausible than its contradictory or negation then it should be believed.

9 **Deductive Reasoning**

- Important Points to Remember:
- An argument may be valid (its conclusion follows necessarily from the premises) and yet not be sound.
- Invalid or unsound arguments are not necessarily evidence that their conclusion is false.

- As Christians, we want to make sure not only that the conclusions we offer are true, but that our arguments are sound.

10 **2. Inductive Reasoning**

- Frequently argues from the specific to the general.
- The conclusion, while probable, is not necessary.
- Most empirical scientific reasoning is based on an inductive process. (e.g. the Laws of Nature)
- Illustration 1:
  - The coin I removed from the bag is a penny.
  - In nine previous attempts, the coins I removed from the bag were pennies.
  - Conclusion: All the coins in the bag are pennies.

11 **Inductive Reasoning**

- Illustration 2:
  - The birds of the air are fed by the Father.
  - The lilies of the field are clothed by the Father.
  - You are more valuable to the Father than the birds or the lilies.
  - Conclusion: Therefore the Father will feed and clothe you.

12 **Deductive or inductive, which is strongest?**

- A deductive argument does not necessarily produce a stronger argument than an inductive argument.
  - The premises of a deductive argument may be weak or uncertain, making the conclusion less certain, though logically valid from the premises.
  - The premises of a deductive argument may themselves be based on inductive reasoning.
  - The premises of an inductive argument may be strong and nearly certain, lending weight to the conclusion.
    - e.g. Newton's Law of Gravity is virtually certain, but it is based entirely on inductive argument, as is most science.

13 **3. Abductive (Adductive) Inference**

- Appears to commit the formal logical fallacy of affirming the consequent.
- A valid deductive argument:

  If A then B
  A
  therefore, B

  (A is called the antecedent, B is called the consequent.)

- An argument which commits the formal fallacy of affirming the consequent:
  If A then B
  B
  therefore A
  - Illustration:
    If it has rained (A) then street will be wet (B).
    The street is wet. (B)
    Therefore it has rained. (A)

14 **3. Abductive (Adductive) Inference**

- Abductive inference avoids the fallacy of affirming the consequent by stating merely the possibility of the antecedent (A).
  If A then B
  B
  therefore possibly A.
- Illustration:
  If it has rained the street will be wet.
  The street is wet.
  Therefore it may have rained.
  - One then assesses the various possible conclusions or hypotheses in order to determine which one is the most plausible.

15 **3. Abductive (Adductive) Inference**

- This form of reasoning is frequently employed in forensics, history, archaeology, origins science (including intelligent design), and other fields to discover the most likely cause in the past of something we observe today.
  - For example:
    Who was the cause of the murdered man's death? What was the cause of the origin of the universe? Given the pottery shards unearthed, what ancient people lived in that area?
    What caused the variety of species of biological life?
    What caused the early church's belief in the resurrection?

16 **Two Approaches to Assessing an Argument or Hypothesis**

- When assessing two or more competing explanations or hypotheses which each appear sound, how do we determine which is the best?
  - Use of Bayes Theorem
  - Use of Inference to the Best Explanation

17 **Bayes Theorem**

- Pr = probability of
- H = the hypothesis
- E = the evidence (data)
- | (vertical line) =“on the” or “given the”
- ¬ = “not” or negation

18 **Bayes Theorem**

- Values are typically assigned using a value between zero and one (0-1) where zero is virtually improbable and one is virtually certain.
- .5 = evenly improbable and probable
- <.5 = somewhat improbable (example: .4)
- << .5 = very improbable (example: .2)
- >.5 = somewhat probable (example: .6)
- >>.5 = very probable (example: .8)
- Given the outcome of employing Bayes Theorem to assess each of two competing hypothesis, the one with the highest outcome is the more probable.

19 **Inference to the Best Explanation: Criteria**

- Explanatory scope: How many things does an hypothesis explain? The more it explains, the greater its explanatory scope.
- Explanatory power: The degree to which an explanation makes the data in question more probable.
- Simplicity (Ockham's Razor): Other things being equal, the more simple an explanation (the one with fewer assumptions) is to be preferred. (Illustration: Motion of the planets explained by heliocentric vs. geocentric systems.)

20 **Inference to the Best Explanation: Criteria**

- Plausibility: The best explanation is the one implied by a greater variety of accepted truths.
- Less ad hoc: Fewer new suppositions not already implied. (Illus. of ad hoc: Life on earth was seeded by beings from outer space.)
- Accord w/accepted beliefs: Implies fewer falsehoods.

- Comparative superiority: Exceeds the other possibilities in the above criteria such that there is little possibility the rivals would succeed in doing so.

21 **How can I Improve My Reasoning Skills?**

- Thinking carefully about my premises and conclusions.
  - How strongly can I support my premises to a skeptical listener?
  - Do my conclusions logically follow from my premises?
  - Thinking carefully about my inductive or abductive arguments.
    - Using Bayes Theorem.
    - Considering the criteria for inferences to the best explanation.

22 **How can I Improve My Reasoning Skills?**

- Reading about or listening to opposing arguments to consider how well my arguments answer opposing views.
- Talking through my arguments aloud, alone or with another.
- Writing out my arguments.
  - Francis Bacon (1561-1626) paraphrased: “Reading makes a full man, conversation a ready man, and writing an exact man.”

23 **Next Week:**

Logic—The Rules of the Road