

1 Critical Thinking: An Introduction

Lecture 1

Fall 2008

2 Course Contacts/URL's

- Syllabus/Lecture Notes
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3 Plan For the Course

- You will first receive basic information on critical thinking and problem-based learning
- You will be active participants, not recipients of information
- You will be given problems to solve, and your success in problem solution will be the focus of attention and evaluation
- We will be concerned primarily with process, not just achievement

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5 Characteristics of Critical Thinkers

Critical thinkers:

- Care that their beliefs be true and that their decisions be justified; that is, care to "get it right" to the extent possible. This includes the dispositions to
 - ✓ Seek alternative hypotheses, explanations, conclusions, plans, sources, etc., and be open to them
 - ✓ Endorse a position to the extent that, but only to the extent that, it is justified by the information that is available
 - ✓ Be well informed
 - ✓ Consider seriously points of view other than their own

6 Characteristics II

Critical thinkers:

- Care to present a position honestly and clearly, theirs as well as others'. This includes the dispositions to
 - ✓ Be clear about the intended meaning of what is said, written, or otherwise communicated, seeking as much information and precision as the situation requires
 - ✓ Determine, and maintain focus on, the conclusion or question
 - ✓ Seek and offer reasons for their opinions/conclusions
 - ✓ Take into account the total situation
 - ✓ Be reflectively aware of their own basic beliefs

7 Characteristics III

Critical thinkers:

- Care about others' point of view and treat it with respect. They:
 - ✓ Discover and listen to others' views and reasons
 - ✓ Avoid intimidating or confusing others, taking into account others' feelings and level of understanding
 - ✓ Are concerned about others' welfare
 - ✓ Are concerned about educating others on the issues

8 Steps in Critical Thinking:

Formulating your argument

- Focus on a question
 - **Identify and formulate the question**
 - **Develop criteria for judging possible answers**
 - **Develop a plan for collecting data**
- Develop an argument
 - **Generate premises and conclusions (the “whereas” and “therefore”)**
 - **Develop reasoning steps/support for conclusions (the “why”)**

9 Steps in Critical Thinking:

Deconstructing your Argument

- Analyze arguments
 1. **Identify conclusions**
 2. **Identify unstated reasons (assumptions)**
 3. **Identify stated reasons**
 4. **Identify and handle irrelevance**
 5. **See the structure of an argument**
 6. **Summarize**

10 Steps in Critical Thinking:

Clarifying Arguments

- Ask and answer questions of clarification and/or challenge, such as:
 1. **Why?**
 2. **What is your main point?**
 3. **What do you mean by...?**
 4. **What would be an example?**
 5. **What would be an exception?**
 6. **How does that apply to this case (describe a case, which might well appear to be a counter example)?**
 7. **What difference does it make?**
 8. **What are the facts?**
 9. **Is this what you are saying: _____?**
 10. **Would you say some more about that?**

11 Steps in Critical Thinking:

Knowing/Analyzing Sources

- ✓ Judge the credibility of a source. Major criteria (but not necessary conditions):
 1. Expertise
 2. Lack of conflict of interest
 3. Agreement among sources
 4. Reputation or risk to reputation
 5. Use of established procedures
 6. Ability to give reasons

12 Steps in Critical Thinking:

Knowing the Basis for Decisions

- Example: guilt or innocence of an accused criminal defendant
 - Is the evidence physical or circumstantial? How good is the evidence? Were there eyewitnesses? How reliable are they?
 - Direct observations are strong evidence because:
 1. Minimal inference involved
 2. Short time interval between observation and report
 3. Report by the observer, rather than someone else (that is, the report is not hearsay, and can be verified)
 4. Corroboration or possibility of corroboration
 5. Good access to actual physical evidence
 6. Competent employment of technology, if technology is useful
 7. Satisfaction by observer (and reporter, if a different person) of credibility criteria

13 Inference

- Induction: moving from specific to general (arguments based on observation or experience)
- Deduction: moving from general to specific (arguments based on laws, rules, or widely-accepted principles)

Gravity example

14 Types of Explanatory Conclusions

1. Causal claims (“Treatment X causes improvement in strength and mobility”)
2. Claims about the beliefs and attitudes of other people (“The American people want security more than prosperity”)
3. Interpretation of others’ intended meanings (“She is always late, so she must not really want to do this”)
4. Historical claims that certain things happened (“He woke up in a bathtub of ice, missing a kidney”)

15 Getting the Data

- Designing experiments, including planning to control variables
- Seeking evidence and counterevidence
- Seeking other possible explanations
- Evaluating the strength of available evidence, with a focus on methodology

16 Judging Conclusions

1. The proposed conclusion would explain the evidence
2. The proposed conclusion is consistent with all known facts
3. Competitive alternative explanations are inconsistent with facts
4. The proposed conclusion seems plausible (less important than 1-3)

17 Say What you Mean

- Defining your terms, and being clear, is critically important
- Example: “Snow skiing is *significantly more dangerous*” than couch-sitting”. What does this mean?
 - Loose use of synonym (it’s “way more dangerous”)
 - Statistically significant
 - Clinically/behaviorally significant
 - The difference matters

18 Ask Testable Questions

- Do infants dream?
- Does caffeine make people anxious?
- Are some people born evil?
- Does smoking lead to lung cancer?
- Are dreams an indication of our unconscious desires and conflicts?
- Is physical therapy beneficial?

19 Causal Arguments

- Truck, bicycle, and car example
- What causes the accident?
- The “one significant difference” idea (inductive)
- Two important rules:
 - Cause must precede the effect in time
 - Correlation does not prove causation.

20 Example: Economics of Obesity

- In the study, one of the first to examine the economic effects of obesity on mature men and women, the researchers examined a wide range of demographic, physical and mental health characteristics to see whether these factors explained the economic differences between obese and non-obese women.
- Average adjusted individual net worth (women)
 - Normal to overweight --- \$225,973
 - Mildly obese --- \$247,140
 - Moderately to severely obese --- \$90,303
- “Obesity is economically burdensome for women. This may be due to cultural norms of attractiveness, which stigmatize obese women in a variety of ways,” the researchers conclude.
- What do you think of this conclusion?

21 Introduction to Statements

- **Most sentences can be true or false, but a few cannot (e.g., commands [“Don’t do that!”], exclamations [“Awesome!”])**
- **True or false sentences are called *statements* or *claims***
- **Three qualities can categorize statements:**
 - **Whether they are *verifiable, evaluative, or advocatory claims***
 - “That sweater is green” (verifiable)
 - “That’s lovely” (evaluative) vs. “The majority of the jury felt the defendant was guilty”
 - “He should treat her better”, “We should legalize marijuana” (advocatory)
 - **Whether they are *specific, of if nonspecific, whether the qualification strengthens or weakens the claim***
 - “47.6% of us want class to end now.”
 - “Approximately half of us are bored”.
 - **Whether they serve as conclusions, premises, or support in an argument**
- **Specific claims are often the most persuasive, but are also most easily refuted.**