

WHAT DOES CRITICAL THINKING MEAN IN TEACHING ECONOMICS? THE BIG AND LITTLE OF IT



"I expect you all to be independent, innovative, critical thinkers who will do exactly as I say!"

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CRITICAL THINKING IN ECONOMICS

Agreement among economists that critical thinking capability is an admirable goal:

- But what does “critical thinking” really mean for economists?
- How do we teach critical thinking?
- How do we know whether students learn to think critically?

Two definitions of critical thinking:

(1) Proper use of deductive reasoning, and (2) reaching conclusions from evidence

- Unveil improbable claims; distinguish facts from inferential claims
 - Expose rhetorical ploys appealing to emotions, biases, and prejudices
 - Ask “how” and “why” questions
 - Intellectual integrity, humility, civility, and sense of justice
 - Distinguish deductive and inductive arguments

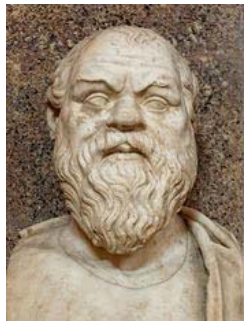
Finding fault with an argument (most common application of the words)

- The word “critical” comes from the classic Greek *krinein*, which refers to judging, discerning, or estimating the value of something

- Critical thinking is the conscious, deliberate, rational evaluation of claims according to *identified standards of proof*; the objective analysis of facts to form a judgment that includes the rational skeptical, unbiased analysis of factual evidence.
- The essence of critical thinking is to approach questions with an open mind and to base conclusions on logical deductive reasoning and evidence, while recognizing our limitations of being open-minded.



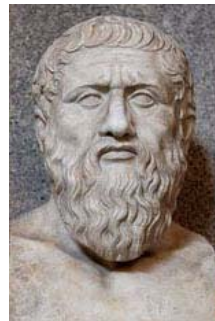
- Socrates showed that authority does not insure accurate knowledge.
- He set the agenda for the tradition of critical thinking, namely, to reflectively question common beliefs, distinguishing those beliefs that are reasonable and logical from those which lack adequate evidence or a rational foundation to warrant acceptance.
- Socrates' practice was followed by Plato, Aristotle, and other Greek philosophers.



Socrates



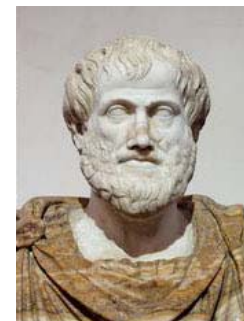
Colander



Plato



Siegfried



Aristotle

CHARACTERISTICS OF CRITICAL THINKING

- Working backwards from conclusions to premises is unacceptable
- An attitude that is open minded, honest, and accepts conclusions only if they are derived from unbiased evidence
- Minimize one's ego-centric tendencies
- Listen and learn from others rather than argue so as to dominate them
- Understand all sides of an issue
- Employ appropriate statistical tests
- Recognize unstated assumptions (e.g. all markets are competitive, only things measured in GDP are valuable)
- Use good measurement principles (AEA Comm. on Economic Statistics)
 - Reliability
 - Relevance
 - Transparency (reproducibility)
 - Consistency
 - Timeliness
 - Accessibility

DISTINGUISH LITTLE-THINK FROM BIG-THINK CRITICAL THINKING

Little-think (inside the box) critical thinking

- Learning existing tools, models, methods that economists have found useful; grounded in methods of science; separates experts from armchair ruminators
- Empirical regularities and laws that economists have found useful
- Neo-classical models
 - Incentives matter
 - People make choices involving trade-offs reflecting costs and benefits
 - Price systems create incentives that align private with general interest
 - Voluntary exchange enhances expected welfare

Big-think (or outside the box) critical thinking

- Based on methodology of philosophy; relies on instinct, reflective thinking
- Sees many important questions as not answerable by science
- Teaching how to reflect on the usefulness and limitation of little-think tools
- Relevance to real world: where the models make sense and where they don't
- Reminds us of hidden normative judgments that may underlie conclusions

LITTLE-THINK CRITICAL THINKING (NEO-CLASSICAL MODELS OF REASONING AND VALID STATISTICAL TESTING)

[The distinctive economics approach for judging arguments]

1. Supply and demand

- a. Role of competitive free markets in allocating resources efficiently
- b. Supply depends on costs (opportunity cost)
- c. Supply depends on individual establishments and the number of them
- d. Demand depends on income and substitution opportunities
- e. Diminishing marginal utility
- f. Excess supply and excess demand induce price changes to encourage changes in the quantity produced and/or demanded at given price

2. Thinking “on the margin”

- a. Compare extra benefits to extra costs
- b. Don't use averages or totals for decision-making
- c. Discount flow of expected benefits and expected costs to the point in time a decision must be made

3. Benefit/cost analysis

- a. Compare net present discounted value of advantages vs. disadvantages at the time of decision
- b. Identify implicit as well as explicit costs and benefits
- c. Include both pecuniary and non-pecuniary benefits and costs
- d. Consider external benefits and costs
- e. Sunk costs and benefits are irrelevant

4. **Voluntary exchange** occurs because people expect to be better off
 - a. When exchange involves groups, some people may end up worse off
 - b. Comparative advantage produces opportunities for win-win trades
 - c. Specialization can also produce opportunities for win-win-trades

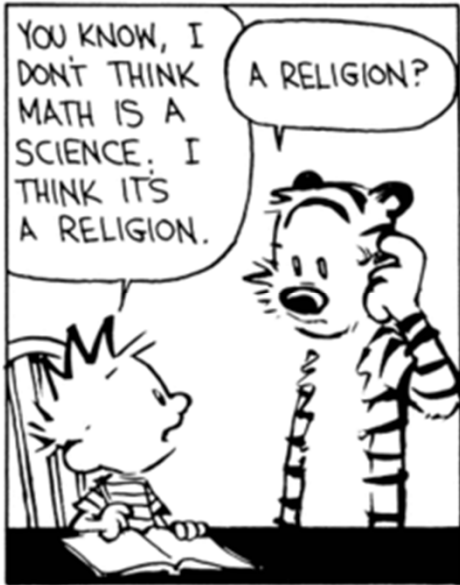
5. Identify **behavioral reactions** to positive and negative incentives
 - a. Monetary and non-monetary
 - b. Models are used to predict changes in behavior
 - c. Measure magnitudes as elasticities

6. Unintended consequences

- a. Beneficial: aspirin found to be anti-coagulant
- b. Innocuous
- c. Harmful: sports player draft leading to “tanking”
- d. Perverse: Peltzman effect: wearing seatbelts causes more car accidents
- e. Common example: minimum wage causing unemployment

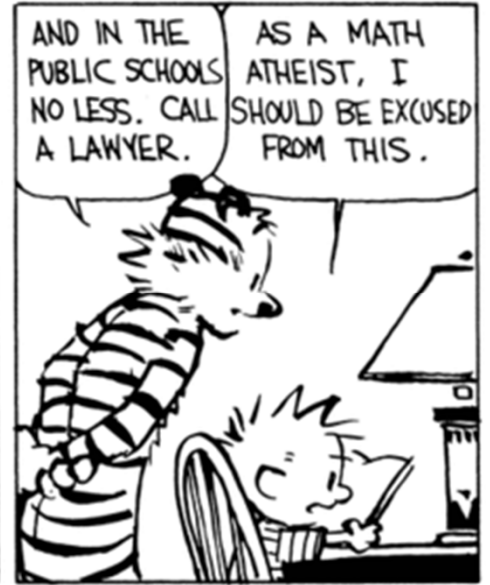
7. Correlation (linear or non-linear)

- a. Causation (A causes B; B causes A; C simultaneously causes A and B; A causes B while B causes A; A and B are randomly correlated)
- b. Identify causation via controlled experiments (like vaccines)
- c. Use accepted levels of tolerance for error (e.g. 1% or 5%)
- d. Economic meaningfulness vs. statistical significance



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YEAH. ALL THESE EQUATIONS ARE LIKE MIRACLES. YOU TAKE TWO NUMBERS AND WHEN YOU ADD THEM, THEY MAGICALLY BECOME ONE *NEW* NUMBER! NO ONE CAN SAY HOW IT HAPPENS. YOU EITHER BELIEVE IT OR YOU DON'T.



8. Multiple (linear and non-linear) regression analysis

- a. Used to eliminate C causing both A and B
- b. Only extraneous variables that affect both A and B need to be controlled

9. Stocks and flows

- a. Time at which stock is measured must be stated
- b. Period over which flow is measured must be identified; flow is rate of accumulation of a stock

10. Social goals (e.g. economic efficiency, equity, freedom, growth, security, and stability): remind students efficiency is not the only objective

- a. Collectively prioritizing these goals is difficult
- b. To what extent is consumer sovereignty acknowledged?
- c. Social goals have characteristics of a public good: everyone must “consume” the same amount

1 1. Risk and uncertainty

- a. Risk refers to decisions made when future events are known with reasonable probabilities (control with diversification and/or insurance)
- b. Uncertainty relates to situations where either the outcomes and/or their probabilities are unknown (can't be controlled)

1 2. Transactions costs: the cost of making an exchange

- a. These are zero for transactions on a blackboard
- b. Examples: search costs to find a buyer or seller, cost of decision-making, costs of enforcing an agreement, bargaining costs, doing due diligence, legal fees, communication costs, and transportation costs
- c. Effects decision to “make or buy,” delineating the extent of the firm
- d. Transactions costs are lower for frequent exchanges, large exchanges, specificity about what is being exchanged, and absence of chances for opportunistic behavior

13. Price discrimination

- a. Requires market power, ability to discern demand, prevent arbitrage
- b. May improve or worsen economic efficiency
- c. Transfers surplus from buyers to sellers

14. Theory of second best

- a. If one optimality condition is violated, the second best solution may be to violate other optimality conditions
- b. Example: encourage monopoly in petroleum industry to restrict output because pollution costs are ignored and output is too large

15. Learning to **accept ambiguity**

- a. Conclusions may be inexact or subject to different interpretations
- b. Economics is a social science, focusing on human behavior, and humans are all different in some way
- c. Selection bias*

*Some of these ideas overlap with George Stigler's list of comments suitable for a seminar on any economics topic ["The Conference Handbook," *JPE* 1977 85(2): 441-43]. For example: "6. Second best considerations would, of course, vitiate the argument; 9. The conclusions change if you introduce uncertainty; 14. But what if transactions costs are not zero?"

HISTORY OF THE PAPER

- Paper has a 30 year history. Started in a 1991 set of papers about what the goal of introductory economics was.
- John was the leader of a distinguished group of economists who popularized the “think like an economist” goal.
- I was an outside commenter on the paper—and questioned what “thinking like an economist” meant. While it was a perfect committee “apple pie and motherhood goal, it was ambiguous, subject to different interpretations.
- Critical thinking is a similar “apple pie and motherhood” concept. We economists all like to think that economists think critically, but that is because we define critical thinking as thinking like us.
- Does it include only learning the way Homo economists act within the textbook model? Or does it assume that the box is simply an arbitrary heuristic, and that thinking like an economist also includes outside the box thinking?
- I argued that the committee goal didn’t make it clear which, and that for me “thinking outside the box” is a necessary part of good “inside the box thinking.” The box is simply a useful heuristic.

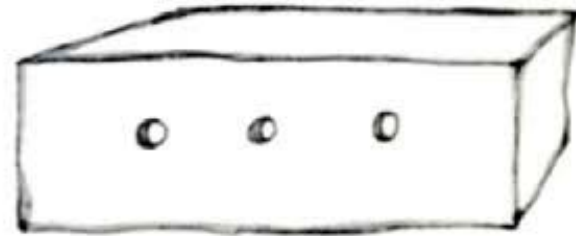
THE BIG THINK COMPONENT OF CRITICAL THOUGHT

Little think: (Inside the box) Know the economist's models, and what we think when we are in economist thinking mode — constrained optimization, opportunity cost, Tanstasfl, cost benefit analysis....

Big think: (A box with no sides) Know that economist's model is just a useful heuristic, not the only reasonable way to look at a problem. A model is a frame, not *the* frame. There are many correct ways.

The Richard Feynman Big Think problem-solving algorithm — Determine the problem; think really hard about it — arrive at a solution.

FRAMING IS CENTRAL: ELDERLY WOMAN OR YOUNG WOMAN?



BIG THINK CRITICAL THOUGHT FOCUSES ON ALTERNATIVE WAYS OF FRAMING

- Reason Important:
- Little think economic critical thought uses scientific method.
- Big think economic thought uses different methodology that requires a philosophical methodology for those areas where science doesn't have answers. Learning through engaged discussion: "argument for the sake of heaven, not to win. Mill's Devil's Advocate. Smith's impartial spectator. Goal is to understand various frames and arrive at reasonable options, not to provide "optimal solutions."
- My definition of "thinking like an economist" includes a big think component. Some economists have smaller big think element.
- Question is: How much big think thinking to include in introductory economics.
- Currently—very little—Most students don't recognize that economics use models as heuristics, not as truths.

BIG-THINK (OUTSIDE THE BOX) CRITICAL THOUGHT



TYPICAL DESCRIPTION OF THINKING LIKE AN ECONOMIST GOAL

At its most basic, thinking like an economist means evaluating the facts without allowing opinion or logical fallacies to enter into the calculation. Economic theory is fundamentally about the idea of scarcity, the idea that everyone—individuals, corporations and governments—only have limited resources and must decide how and where those resources will be allocated. Economists evaluate the “cost” of individual and social choices to determine the best choices for themselves or others in the face of this scarcity. (From American University Economics Dept. Website)

Some implicit assumptions:

- Pricing may change the nature of the relationship, meaning that marketizing goods has a cost. Economist’s analysis hides that cost
- Tastes and norms are endogenously determined. In such a world it is unclear what is being optimized in markets.

Big think policy exploration is different—policy is not maximizing given functions—but exploring various options that might bring people together. Global optimizing, not local optimizing.

THE WRONG TAKEAWAY FROM INTRO COURSES

“I thought of economics as an elaborate hoax (or at best a Panglossian illusion) aimed at justifying the world and keeping it exactly as it was; using simple mathematics to describe some very rudimentary version of it, and “proving” that any attempt to intervene against the smooth functions of the market would wreak havoc.” (Esther Duflo’s takeaway from her introductory course)

SOLVING THE ECONOMIC PROBLEM AFTER THE ECONOMIC PROBLEM HAS BEEN SOLVED

When the accumulation of wealth is no longer of high social importance, there will be great changes in the code of morals. We shall be able to rid ourselves of many of the pseudo-moral principles which have hag-ridden us for two hundred years, by which we have exalted some of the most distasteful of human qualities into the position of the highest virtues. We shall be able to afford to dare to assess the money-motive at its true value. The love of money as a possession -as distinguished from the love of money as a means to the enjoyments and realities of life -will be recognized for what it is, a somewhat disgusting morbidity, one of those semi criminal, semi-pathological propensities which one hands over with a shudder to the specialists in mental disease. All kinds of social customs and economic practices, affecting the distribution of wealth and of economic rewards and penalties, which we now maintain at all costs, however distasteful and unjust they may be in themselves, because they are tremendously useful in promoting the accumulation of capital, we shall then be free, at last, to discard. (Keynes)

SOME BIG THINK CRITICAL THOUGHT ADDITIONS

- Economics provides tools not rules: The introduction to economics should teach a set of analytic and empirical tools, not a set of answers to policy questions.
- We cannot escape normative entanglements• Even with heroic attempts to remain objective, all analytic and empirical tools are entangled with normative elements. Thus, one must always remain open to criticisms related to that entanglement.
- To arrive at policy conclusions, positive tools need to be blended with normative analysis. Recommendations about what you “should do” requires normative judgments that follow from philosophical reasoning, not scientific analysis.
- Conventional economic wisdom about appropriate policy following from economics is just that—conventions, not undebatable truths.

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Complex  Discovery



**“Thinking outside of the box didn’t work.
Thinking inside of the box didn’t work.
Maybe it’s a defective box!”**