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Critical Thinking: What is it to be a Critical Thinker?

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We often urge others to think critically. What does that really mean? How can we think critically?

This essay presents a general account of what it is to be a critical thinker and outlines both traditional and more recent approaches to critical thinking.

1. What is Critical Thinking?

Speaking generally, *critical thinking consists of reasoning and inquiring in careful ways, so as to form and update one's beliefs based on good reasons.*[1] A critical thinker is someone who typically reasons and inquires in these ways, having mastered relevant skills and developed the disposition to apply them.[2]

2. Traditional Components: Logic and Fallacies

Traditional views of critical thinking focus on deductive arguments. *Arguments* are sets of reasons given for a conclusion. *Deductive* arguments are arguments where the reasons given are supposed to be logically conclusive, that is, to guarantee the conclusion. E.g., the following is a deductive argument:

1. Socrates is a man.
2. All men are mortal.
3. Therefore, Socrates is mortal.

Arriving at new beliefs through deductive arguments is a way of forming beliefs based on good reasons. Accordingly, critical thinking traditionally focusses on these skills:[3]

- distinguishing arguments (instances where you are offered reasons for a conclusion) from mere assertions, rhetorical questions, and attempts at manipulation through irrelevant considerations;

- identifying *conclusions* of arguments (what the person offering the argument wants to persuade you to believe), and the *reasons* or *premises* for that conclusion;

- reconstructing streamlined, complete statements of arguments in standard form (as a numbered list of premises with the conclusion at the end), or using diagrams;[4]

- assessing the logical structure of deductive arguments: answering 'Is there any way for the premises to be true while the conclusion is false?'

- understanding arguments' claims: e.g., defining unclear terms;

- determining whether premises are true or likely;

- imagining, proposing, and charitably responding to objections, i.e, reasons given to doubt or deny the argument's logic, premises or conclusion.[5]

To develop these skills, traditional critical thinking courses typically include propositional logic and the study of common good argument forms.[6]

They also often teach how to identify *fallacies*—faulty patterns of reasoning that deceptively appear to be good arguments.[7] These include:

- *affirming the consequent* ("If Kat had won the prize, she would have had an A; Kat had an A; therefore, Kat won the prize");

- the *ad hominem* fallacy—where people attack the *person* making an argument instead of considering their argument;

- *begging the question*—offering reasons for a conclusion that *assume* the conclusion, and many others.[8]

3. Additional Formal Tools: Evidence and Statistics

We often form beliefs based on observations that, unlike deductive arguments, do not provide *conclusive* reasons for a belief: e.g., you might conclude that your sibling is angry at you from their facial expressions or come to believe you have a cold because you have a runny nose. Here, these

observations or evidence might support the belief formed, but do not *guarantee* the truth of your belief.

Critical thinkers know how to adjust their beliefs appropriately in light of their evidence.[9] So critical thinking requires developing abilities to:

- assess evidence without being unduly swayed by what one already believes;

- recognize when a claim counts as evidence for (or against) a conclusion;

- identify when evidence is strong (or weak);

- determine the extent to which people's views should change, given their evidence.

To develop these abilities, drawing on knowledge of probability can be helpful: e.g., basic probability offers a recipe for determining when an observation counts as evidence for a belief: when that observation is *more likely if the belief is true than if it is not*. It also teaches us that updating your beliefs when you get new evidence requires taking into account *both* (a) how confident you were on that belief beforehand and (b) how strongly the evidence supports that (new) belief.[10]

For these reasons, recent approaches to critical thinking often include instruction in probability.[11] And, because we often get evidence in the form of statistics, often presented through diagrams and graphs, such approaches tend to highlight the importance of basic statistical concepts,[12] and the ability to interpret diagrams and graphs.[13]

4. Applied Skills as Part of Being a Critical Thinker

Being a critical thinker requires more than having technical tools (such as the tools of logic or probability) stored away. It requires *consistently* applying them *in the real world*.

In recent discussions of what it is to be a critical thinker, there has been increased emphasis on navigating our informational environment in savvy ways. This requires avoiding false, misleading, manipulative, or distracting claims online, as well as making sure that one gathers information from a wide variety of reliable sources.[14] It also requires calibrating one's *trust* well: one should remain open to hearing those who disagree and not let prejudice and *implicit bias* affect whom one trusts.[15],[16]

Applying the tools of critical thinking throughout one's life requires overcoming cognitive biases:[17] e.g.:

- not always accepting answers that come to mind first;

- resisting *confirmation bias* (the tendency to gather and interpret evidence in ways that confirm our beliefs),[18] and;

- avoiding *motivated reasoning* (the tendency to reason in ways that help us believe what we *wish* were true, and not what is true).[19]

More generally, becoming a critical thinker requires shifting from a defensive mindset to a truth-seeking one and developing intellectual virtues such as intellectual humility and open-minded curiosity.[20],[21] Without those, the tools of critical thinking may end up being deployed to entrench false or unreasonable beliefs.

5. Conclusion

Critical thinking is about reasoning and inquiring so as to form and update one's beliefs based on good reasons. Because critical thinking skills are valuable in a world that emphasizes the ability to navigate information, becoming a critical thinker is practically useful to us as individuals.

It is also of crucial social and political value: e.g., a well-functioning democracy requires citizens who think critically about the world.[22] And critical thinking has liberatory potential: it provides us with tools to criticize oppressive social structures and envisage a more just, fairer society.[23]

Acknowledgments

Notes

[1] This definition is similar to Ennis's (1991) definition: critical thinking, in his view, is "reasonable reflective thinking that is focused on deciding what to believe or do" (Ennis 1991, p. 6). See Hitchcock 2010 for an overview of definitions of critical thinking.

[2] While I define critical thinking in a general way here, there is disagreement about whether there are any general tools for critical thinking, as opposed to merely topic-specific ones.

There are also closely related debates about the extent to which specific critical thinking skills *transfer* to new domains and tasks, and about whether we should teach critical thinking on its own or, instead, in the context of specific disciplines, with discipline-internal standards made clear and an emphasis on content acquisition. See Willingham 2019 for discussion, including references to relevant empirical research.

People who have mastered critical thinking skills in a domain or subject area tend to be *experts* in those areas. See Expertise: What is an Expert? by Jamie Carlin Watson

[3] See this Khan Academy/Wi Phi Philosophy course for an overview.

[4] An example of an argument in standard form is: 1. Socrates is a man; 2. All men are mortal; 3. Therefore, Socrates is mortal. For other examples of arguments in standard form, see Anderson's "Putting an Argument in Standard Form." For examples of argument diagrams, as well as a useful program to construct such diagrams, see Cullen's "Philosophy Mapped" website.

[5] Charitably responding involves responding to the strongest version of the objection.

[6] Propositional logic is the simplest branch of logic, i.e. the formal study of arguments and reasoning. See Tom Metcalf's Formal Logic: Symbolizing Arguments in Sentential Logic by for an introduction.

[7] Wikipedia has extensive lists of good argument forms and of common fallacies. See Boardman et al. 2017, Howard-Snyder 2020, Lau 2011, Vaughn 2018 for examples of critical thinking textbooks that take the traditional approach.

[8] To see why these are fallacies, note that, for all that is said, Kat could have had an A without winning the prize; perhaps she simply had high exam scores. And note that morally bad people can give good arguments.

[9] Philosophers also use the term 'evidence' in more technical senses than 'relevant observations'. See Kelly 2016 for discussion of these different senses.

[10] Indeed, we can capture this insight into a domain-general formula for how to update beliefs: Bayes' theorem. Bayes' theorem tells us how to weigh our previous confidence and the strength of evidence. For a short explanation of Bayes' Theorem, see Better Explained, "A Short and Intuitive Explanation of Bayes' Theorem". For more detailed discussion of Bayesianism, see Joyce 2019.

[11] Manley 2019.

[12] See Gigerenzer et al. 2007 for discussion of the practical importance of these concepts. An especially important statistical concept is that of *base rate*. The base rate of a feature in a population is what fraction of the population have that feature. Neglecting the base rate leads to the *base rate fallacy*, where one ends up adjusting one's beliefs incorrectly in response to evidence (for example, taking a fallible positive test for a rare disease to indicate that one is extremely likely to have that disease, where, given the rarity of the disease, that remains unlikely).

[13] Battersby 2016.

[14] See Bergstorm and West's "Calling Bullshit" syllabus for a range of helpful tools for avoiding such claims, and The News Literacy Project for resources on developing a healthy news diet.

[15] See Nguyen's "Escape the Echo Chamber." for helpful discussion of common issues with trust calibration and with information gathering.

[16] Implicit bias involves believing and acting "on basis of prejudice and stereotypes without intending to do so": see Brownstein 2019.

When one discredits members of marginalized groups due to (conscious or unconscious) prejudice, one commits an epistemic injustice: see Fricker 2007. For an introduction to epistemic injustice, see Huzeyfe Demitras's Epistemic Injustice.

[17] Cognitive biases are systematic deviations from how we should reason. See Kahneman 2011 for an accessible overview of research on cognitive biases.

[18] Nickerson 1998.

[19] Kunda 1990.

[20] An *intellectual virtue* is a personality trait or disposition that is helpful in reasoning well and acquiring knowledge. Some examples are intellectual humility, open-mindedness, curiosity, and perseverance. See Zagzebski 1996.

[21] See Galef's TED talk "Why you think you're right – even if you're wrong" for discussion of the importance of these traits.

[22] Dewey 1923.

[23] Freire 1968/2018, hooks 2010.

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