

Eight Guidelines for Critical and Creative Thinking

From Psychobabble and Biobunk: Using Psychology to Think Critically About Issues in the News (Carol Tarvis, 2001)

Note: The following guidelines are not the only ones possible. They do not include all the skills of logic and debate, every principle of scientific reasoning, nor all the mental and emotional obstacles to critical thinking. The (Re. . .) inserts are by Dr. Gould regarding relevancy to Science -- in addition to their relevancy to daily life.

1. Ask questions; be willing to wonder. (Re. research problems) To think critically you must be willing to think creatively - to be curious about the puzzles of human behavior, to wonder why people act the way they do, and to question received wisdom and examine new explanations of why things are as they are.
2. Define your terms. (Re. operational definitions) Identify the problem in clear and concrete terms, rather than vague ones like "happiness," "potential," or "self-esteem."
3. Examine the evidence. (Re. data: empiricism, reliability, and validity) Consider the nature of the evidence supporting various approaches to the problems under examination. Is there good evidence one way or another? Is it reliable? Valid? Is the "evidence" merely someone's personal assertion or speculation, or is it based on replicated empirical data?
4. Analyze assumptions and biases - your own and those of others. (Re. empirical/objective observations: biases and assumptions) What prejudices, deeply held values, and other biases do you bring to your evaluation of a problem? Are you willing to consider evidence that contradicts your beliefs? Can you identify the assumptions and biases that others bring to their arguments?

5. Avoid emotional reasoning. (Re. empirical observations) The fact that you feel strongly about something doesn't make you right! Remember that everyone holds convictions about how the world operates (or how it should operate), and your opponents are probably as serious about their convictions as you are about yours. Feelings are important, but they should not be substitutes for careful appraisal of arguments and evidence.

6. Don't oversimplify. (Re. Generalizations) Look beyond the obvious; reject simplistic thinking ("All the evil in the world is due to that group of loathsome people") and either-or thinking ("Either genes determine everything about personality and behavior or they count for virtually nothing"). Be wary of "argument by anecdote," taking a single case as evidence of a larger phenomenon. For example, reading about one chilling case of a man who murders while on parole should not be the basis on which you assess parole programs in general.

7. Consider other interpretations. (Re. alternative explanations, or hypotheses; mutual exclusiveness and exhaustiveness) Before you draw a conclusion from the evidence, think creatively about other possible explanations. When you learn that two events are statistically correlated, for example, be sure to think carefully about which one is the cause and which the result - or whether a third factor might be causing both of them.

8. Tolerate uncertainty. (Re. Theories and data: testing and modifying) This is probably the hardest step in becoming a critical thinker, for it requires that we hold our beliefs "lightly" and be willing to give them up when better evidence comes along. It requires us to live with the realization that we may not have the perfect answer to a problem at the moment, and may never have it. Many people want "the" answers, and they want science to provide them: "Just tell me what to do!" they demand. Pseudoscience promises answers, which is why it is so popular; science gives us probabilities that suggest one answer is better than another - for now - and warns us that one day we may have to change our minds.