

The Nature of Critical Thinking: Outlines of General Critical Thinking Dispositions and Abilities

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Critical thinking is "reasonable reflective thinking focused on deciding what to believe or do." This definition (or *concept*) of critical thinking I believe captures the core of the way the term is ordinarily used by supporters of critical thinking. In deciding what to believe or do, one is helped by the employment of a set of critical thinking dispositions and abilities (which is a *conception* of critical thinking) that I outline in detail below. This conception of critical thinking can serve as a set of comprehensive goals for a critical thinking curriculum and its assessment, and could be used as a syllabus for a course or a curriculum in critical thinking.

An earlier version of the present statement, "The Nature of Critical Thinking: Outlines of General Critical Thinking Dispositions and Abilities" is in Ennis, 2011a.

For interactive teaching suggestions that would make such a syllabus more engaging, see "Twenty-One Strategies and Tactics for Teaching Critical Thinking" on this web site, <http://criticalthinking.net>, under "How can critical thinking be taught?" An earlier version of these strategies and tactics is in Ennis, 2011b.

Usefulness in curriculum decisions, teaching, and assessment, not elegance or mutual exclusiveness, is the purpose of this outline. For the sake of brevity, clarification in the form of examples, qualifications, and more detail, including more criteria, are omitted, but can be found in sources listed below, including "Critical thinking: A streamlined conception" (a revised version of 1991b), (2015), "Critical thinking: Reflection and perspective—Part I" (2011a), "[Critical Thinking: A Streamlined Conception](#)" (downloadable here), (1991b), "A Taxonomy of Critical Thinking Dispositions and Abilities" (1987b), A conception of critical thinking – with some curriculum suggestions (1987a), "A Conception of Rational Thinking" (1980), A concept of critical thinking (1962), but more fully in *Critical Thinking* (1996a). See Note 1 for more detail.

Although the word 'critical' in the English language is sometimes used in a negative sense, the concept of critical thinking presented here is not negative. To my knowledge, no participants in the critical thinking movement endorse a negative notion. Furthermore the concept of critical thinking presented here does not define critical thought as persuasion, but critical thought will, let us hope, be more persuasive than uncritical thought. The future of democracy depends on it.

These outlines of dispositions and abilities are the evolved encapsulation of many years of work in the elaboration of the simple definition (the concept) of 'critical thinking' given above. This elaboration resulted from consultation with classical and current authorities on good thinking, and from repeatedly asking the question, "How do people go wrong in their thinking?" Pursuing this question was not circular because there is much that we know from experience, if we just think about it.

A recent addition to abilities is attention to graphs & maths, including a few concepts in elementary statistics. The need to include graphs & maths (Ability #4) is evident to anyone familiar with current discussion and citation of studies of public issues.

GENERAL CRITICAL THINKING DISPOSITIONS

Ideal critical thinkers are disposed to

1. Seek and offer clear statements of the conclusion or question
2. Seek and offer clear reasons, and be clear about their relationships with each other and the conclusion
3. Try to be well informed
4. Use credible sources and observations, and usually mention them
5. Take into account the total situation
6. Keep in mind the basic concern in the context
7. Be alert for alternatives
8. Be open-minded
 - a. Seriously consider other points of view
 - b. Withhold judgment when the evidence and reasons are insufficient
9. Take a position and change a position when the evidence and reasons are sufficient
10. Seek as much precision as the nature of the subject admits
11. Seek the truth when it makes sense to do so, and more broadly, try to "get it right" to the extent possible or feasible
12. Employ their critical thinking abilities and dispositions

See Note 2.

GENERAL CRITICAL THINKING ABILITIES

A summary outline is presented first, followed by a detailed outline that includes criteria and details, is difficult reading when read straight through, and should be consulted when in search of details and criteria. At appropriate points in the detailed outline one will find some references to prior work that provides enlightening discussion, and a number of principles and criteria, especially for the more advanced topics (e.g., argument and inference to best explanation, ascribing assumptions, definition).

Summary outline of general critical thinking abilities (or skills):

Ideal critical thinkers have the ability to:

(Basic Clarification)

1. Focus on a question
2. Analyze arguments
3. Ask and answer clarification questions
4. Understand and use elementary graphs and maths

(Bases for a Decision)

5. Judge the credibility of a source
6. Observe, and judge observation reports
7. Use existing knowledge
 - a. background knowledge, including (with discretion) internet material
 - b. their knowledge of the situation
 - c. their previously-established conclusions

(Inference)

8. Deduce, and judge deductions
9. Make, and judge inductive inferences and arguments
 - a. Enumerative induction
 - b. Argument and inference to best explanation
10. Make, and judge value judgments
(Advanced Clarification)
11. Define terms, and judge definitions
12. Handle equivocation appropriately
13. Attribute and judge unstated assumptions
14. Think suppositionally
15. Deal with fallacy labels
16. Be aware of, and check the quality of, their own thinking ("metacognition")
17. Deal with things in an orderly manner
(Not Constitutive, But Often Helpful If Not Misused)
18. Employ rhetorical strategies

Detailed outline of general critical thinking abilities (or skills):

Citations are to sources of extended elaboration.

(Basic Clarification, 1 - 4)

1. *Focus on a question:*
 - a. Identify or formulate a question
 - b. Identify or formulate criteria for judging possible answers
 - c. Keep the question and situation in mind
2. *Analyze arguments:*
 - a. Identify conclusions
 - b. Identify reasons or premises
 - c. Identify simple assumptions (see also Ability #13)
 - c. Identify and handle irrelevance
 - d. Determine the structure of an argument, possibly with a diagram
 - e. Summarize
3. *Ask and answer clarification questions, such as:*
 - a. Why?
 - b. What is your main point?
 - c. What do you mean by....?
 - d. What would be an example?
 - e. What would not be an example (though close to being one)?
 - f. How does that apply to this case (describe a case, which appears to be a counterexample)?
 - g. What difference does it make?
 - h. What are the facts?
 - i. Is this what you are saying: _____?
 - j. Would you say more about that?

4. *Understand and use elementary graphs and maths:*

- a. Read graphs, scatterplots, tables, bar charts, etc.
- b. Do and understand arithmetic and other elementary mathematics, such as percentages
- c. Understand the concepts of correlation, standard deviation, and statistical significance
 - (1) Correlation: the degree to which two variables vary together
 - (2) Standard deviation: very roughly, the amount of variation in a group of numbers
 - (3) Statistical significance: Commonly a difference between mean scores is judged statistically significant if a certain amount of difference could not have happened by chance more than at a chosen level. Often one time out of a hundred is the chosen level, but five times out of a hundred is sometimes chosen. The latter is easier to attain.

(Bases for Inference, 5 - 7)

5. *Judge the credibility of a source* (Ennis, 1974a). Major criteria (but not necessary conditions):

- a. Expertise
- b. Lack of conflict of interest
- c. Agreement with other sources
- d. Reputation
- e. Use of established procedures
- f. Known risk to reputation (i.e., the source's knowing of a risk to reputation, if wrong)
- g. Ability to give reasons
- h. Careful habits

6. *Observe, and judge observation reports.* Major criteria (but not necessary conditions, except for the first) include these:

- a. Minimal inferring involved
- b. Short time interval between the observation and the report
- c. Report by the observer, rather than someone else (that is, the report is not hearsay); crucial in the courts
- d. Provision of records
- e. Corroboration
- f. Possibility of corroboration
- g. Good access
- h. Competent employment of technology, if technology applies
- i. Satisfaction by observer (and reporter, if a different person) of the credibility criteria in Ability #5 above

7. *Use existing knowledge*

- a. background knowledge, including (with discretion) internet material
- b. their knowledge of the situation
- c. their previously established conclusions

(Inference, 8 - 10)

8. *Deduce, and judge deduction* (Ennis, 1969a, 1981, 1996a, 2001, 2004):

- a. Basic criterion: An argument is deductively valid, if and only if, denial of the conclusion contradicts the assertion of the premises.
- b. Class logic
- c. Conditional logic

- d. Interpretation of logical terminology, including
 - (1) Negation and double negation
 - (2) Necessary and sufficient condition language
 - (3) Such words as "and", "only", "if and only if", "or", "some", "unless", and "not both"
- e. Qualified deductive reasoning (a loosening for practical purposes), (Ennis, 2004, 2006, 2007)

9. *Make and judge inductive inferences and arguments (Enumerative and Best-Explanation Induction)*

- a. *To generalizations* (enumerative induction). Broad considerations:
 - (1) Typicality of data, including valid sampling where appropriate
 - (2) Volume of instances
 - (3) Conformity of instances to the generalization
 - (4) Having a principled way of dealing with outliers
- b. *To explanatory hypotheses and conclusions*:

(Argument and inference to best explanation (Battersby, 2006; Ennis, 1968, 1982a, 1982b, 1996a, 2012; Harman, 1965, 1968, 1973; Lewis, 2000; Mackie, 1974; Lipton, 2004; Woodward, 2008))

 - (1) Major types of explanatory conclusions and hypotheses, showing how broadly this type of inference and argument applies:
 - (a) Specific and general causal claims
 - (b) Claims about the beliefs and attitudes of people
 - (c) Interpretation of intended meanings
 - (d) Historical claims that certain things happened (including criminal accusations)
 - (e) Reported definitions (Ability #11b1)
 - (f) Claims that some proposition is an unstated, but used, reason (Ability #13b3)
 - (2) Characteristic investigative activities:
 - (a) Designing and doing experiments, including planning to control variables
 - (b) Seeking evidence and counterevidence, including statistical significance, correlations, mean differences, and standard deviations
 - (c) Seeking other possible explanations
 - (3) Rough criteria, application of which requires judgment. The first four are essential, the fifth desirable:
 - (a) The proposed conclusion would explain or help explain the evidence
 - (b) The proposed conclusion is consistent with all known facts
 - (c) Competitive alternative explanations are inconsistent with facts
 - (d) A competent sincere effort has been made to find supporting and opposing data, and alternative hypotheses
 - (e) The proposed conclusion seems plausible and simple, fitting into the broader picture

10. *Make and judge value judgments*, taking into account:

- a. Background facts
- b. Consequences of accepting or rejecting the judgment
- c. Prima facie application of acceptable principles
- d. Alternatives
- e. The need to balance, weigh, decide \

(Advanced Clarification, 11 - 17)

11. *Define terms and judge definitions*, using appropriate criteria

(Three basic dimensions: form, stance, and content. These should be appropriate for the situation.)

a. Definition form. For discussion of Forms 1 through 4 and 6, see Ennis (1996a, Ch 12 & 13). For #5 see Ennis (1964 or 1969b). For all (in science), see Ennis (1974b).

(1) Synonym form (one word = another word)

(2) Classification form (genus-differentia), (items properly labeled by a term (a noun) are members of a class and are differentiated from other members of the class)

(3) Range form (like classification, but with imprecise boundaries)

(4) Equivalent-expression form (term being defined is embedded in a larger expression, which is equated with another expression)

(5) Operational form (like equivalent-expression, but the second expression describes an operation and a consequent observation; can be strict (as in behaviorism) or loose), (Ennis, 1964, 1969b)

(6) Example and non-example form (non-examples sometimes being particularly informative)

b. Definitional stances (report, stipulate, express a position):

(1) Report a meaning (criteria: the five criteria for an explanatory hypothesis in Ability #9b3)

(2) Stipulate a meaning (criteria: convenience, consistency, avoidance of equivocation)

(3) Express a position on an issue (positional definitions, including "programmatic", "persuasive", and scientific definitions), (criteria: all dispositions and abilities, (Scheffler, 1960; Stevenson, 1944; Ennis, 1996a, 2001))

c. Content of the definition

The situation in which a definition is used bears upon the dimensions. Situations include:

(1) Teaching or learning a language

(2) Providing a convenient label for something

(3) Being a premise in an argument

(4) Serving as part of a theory

(5) Providing guidance

12. *Handle equivocation appropriately* (equivocation being the exploitation of a shift in meaning), both when deliberate and when not deliberate (the latter being called "impact equivocation" (having the impact of equivocation))

13. *Attribute and judge unstated assumptions* (an ability that consists of both basic clarification and inference):

a. Pejorative flavor (implication of dubiousness or falsity): commonly but not always associated to some degree with the other types of assumptions; criteria are to be found in Abilities #5 through #9 above

b. Types:

(1) Presuppositions (required for a proposition to make sense)

(2) Needed assumptions (needed by the reasoning to be at its strongest (though not logically necessary); see Inferences (Abilities 8 to 10 above), (Ennis, 1961, 1982c, 2001); called "assumptions of the argument" by Hitchcock (1985)

(3) Used assumptions are consciously or unconsciously used by the assumer (judged by hypothesis-testing criteria (Ability #9b3); Ennis (1982c); called "assumptions of the arguer" by Hitchcock (1985).

14. Think suppositionally: Consider and reason from premises, reasons, assumptions, positions, and other propositions with which one disagrees or about which one is in doubt, without letting the disagreement or doubt interfere with one's reasoning

15. Deal with fallacy labels. Employ, recognize, and appropriately react to "fallacy labels" in discussion and presentation (oral and written). Examples of fallacy labels are "circularity," "bandwagon", "post hoc", "equivocation", "non sequitur", and "straw person"

a. Fallacy labels are often convenient ways for those conversant with the vocabulary to communicate the nature of a believed flaw in some thinking (e.g., "post hoc").

b. They can be intimidating, though actually relatively uninformative, to those not conversant with the language (e, g., "non sequitur").

d. Fallacy labels often pick out a problem, but sometimes activities that fit a fallacy label are not fallacious, for example, appeal to authority and circularity. Some appeals to authority are appropriate, and deductively valid arguments are literally circular.

b. Criteria and principles for judgments underlying the appropriate use of fallacy labels appear in Abilities 1-14 above. But there does not appear to be an intuitive comprehensive summary of critical thinking concerns in fallacy language.

16. Be aware of, and check the quality of, their own thinking (metacognition)

17. Proceed in an orderly and reasonable manner appropriate to the situation:

a. Follow problem solving steps

b. Employ a reasonable critical thinking checklist for dealing with a position on an issue, such as "FRISCO" (Ennis, 1996a):

F Focus: What is the point or issue? Keep it in mind

R Reasons: What are the reasons in support of, and in conflict with, the point or conclusion?

I Inference: Are the inferences reasonable?

S Situation: How does all this fit in with the situation?

C Clarity: Is it all sufficiently clear?

O Overview: On review of the above, how do these features look separately and as a unit?

c. Develop and apply these qualities of a reasonable thinker in a situation ("SEBKUS"):

S Sensitivity

E Experience

BK Background Knowledge

US Understanding of the Situation

(A facilitative ability, not constitutive of critical thinking, but helpful, 18)

18. Deal with rhetorical strategies

Rhetorical strategies can be useful in critical thinking to help make a reasonable critical thinking position more persuasive. It can also be useful to us to be aware of rhetorical strategies in order not to be fooled by them, or even to be persuaded by them especially when the rhetorically-effective position is no better than, or is worse than, another position.

SUMMARY AND COMMENTS

In brief, the ideal critical thinker is disposed to try to grasp a position clearly, to "get it right," to find the truth if it is to be found, and to present a position honestly and clearly; the ideal critical thinker has the ability to clarify, to seek and judge well the basis for a view, to infer wisely from the basis, to suppose and integrate imaginatively, and to do these things with sensitivity and skill.

Space limitations have precluded exemplifying here these principles and criteria, and their application in real-life situations, though I have done so elsewhere (1959, 1962, 1980, 1987a, 1987b, 1991b, 2015, and (especially) 1996a).

A broad integrative personal reflection/perspective on the nature of critical thinking can be found in Ennis (2011a), and with application to teaching and assessment in Ennis (2011b).

REFERENCES

- Battersby, Mark. (2006). Applied Epistemology and Argumentation in Epidemiology. *Informal Logic* 26 (1): 41-62.
- Ennis, Robert H. (2015). Critical thinking: A streamlined conception (A revised version of 1991b, below). In Davies, Martin and Ronald Barnett (eds.), *A handbook of critical thinking in higher education*. New York: Palgrave Macmillan. Pp. 31-47.
- _____. (2013). Critical thinking across the curriculum: The Wisdom CTAC program. *Inquiry: Critical Thinking across the Disciplines*, 28, (2), 25-52.
- _____. (2012). Analyzing and defending sole singular causal claims. A paper presented at the Biennial meeting of the Philosophy of Science Association, November, 2012.
- _____. (2011a, 2011b). Critical thinking: Reflection and perspective—Parts I and II. *Inquiry: Critical Thinking Across the Disciplines*, 26, 1, 2, pp. 4-18, pp. 5-19.
- _____. (2007). 'Probable' and its equivalents. In Hans V. Hansen & Robert C. Pinto (Eds.), *Reason reclaimed: Essays in honor of J. Anthony Bair and Ralph Johnson*. Newport News, VA: Vale Press. Pp. 243-256.
- _____. (2006). 'Probably'. In David Hitchcock & Bart Verheij (Eds.), *Arguing on the Toulmin model*. Dordrecht, the Netherlands: Springer. Pp. 145-164.
- _____. (2004). Applying soundness standards to qualified reasoning. *Informal Logic*, 24, 1, 23-39.
- _____. (2002). Goals for a critical thinking curriculum and its assessment. In Arthur L. Costa (Ed.), *Developing minds* (3rd Edition). Alexandria, VA: ASCD. Pp. 44-46.
- _____. (2001). Argument appraisal strategy: A comprehensive approach. *Informal Logic*, 21 (2), 97-140.

- _____. (1996a) *Critical thinking*. Upper Saddle River, NJ: Prentice-Hall.
- _____. (1996b). Critical thinking dispositions: Their nature and assessability. *Informal Logic*, 18, 2 & 3, 165-182 .
- _____. (1991a). An elaboration of a cardinal goal of science instruction: Scientific thinking. *Educational Philosophy and Theory*, 23 (1), 31-45.
- _____. (1991b). Critical thinking: A streamlined conception. *Teaching Philosophy*, 14 (1), 5-25.
- _____. (1987b). A taxonomy of critical thinking dispositions and abilities. In J. Baron & R. Sternberg (Eds.), *Teaching thinking skills: Theory and practice*. New York: W.H. Freeman. Pp. 9-26.
- _____. (1987a). A conception of critical thinking – with some curriculum suggestions. *APA Newsletter on Teaching Philosophy*, Summer. Pp.1-5.
- _____. (1982a). Abandon causality? *Educational Researcher*, 11 (7), 25-27.
- _____. (1982b). Mackie's singular causality and linked overdetermination. In Asquith, Peter D. & Nickles, Thomas (Eds.), *PSA 1982*. East Lansing MI: Philosophy of Science Association. Pp. 55-64.
- _____. (1982c). Identifying implicit assumptions. *Synthese*, 51, 61-86.
- _____. (1981). A conception of deductive logic competence. *Teaching Philosophy*, 4, 337-385.
- _____. (1980). Presidential address: A conception of rational thinking. In Jerrold Coombs (Ed.), *Philosophy of education 1979*. Bloomington, IL: Philosophy of Education Society. Pp. 1-30.
- _____. (1974a). The believability of people. *Educational Forum*, 38, 347-354.
- _____. (1974b). Definition in science teaching. *Instructional Science*, 3, 285-298.
- _____. (1973). The responsibility of a cause. In Brian Crittendon (ed.), *Philosophy of education 1973*. Edwardsville, IL: Studies in Philosophy and Education. Pp. 86-93.
- _____. (1969a). *Ordinary logic*. Englewood Cliffs, NJ: Prentice-Hall.
- _____. (1969b). Operationism can and should be divorced from covering law assumptions (a reprint of "Operational Definitions (1964). In L.I. Krimerman (Ed.), *The nature and scope of social science: A critical anthology*. New York: Appleton-Century-Crofts, pp. 431-444. Pp. 431-444.
- _____. (1969c). *Logic in teaching*. Englewood Cliffs, NJ: Prentice Hall.

_____. (1968). Enumerative induction and best explanation. *The Journal of Philosophy*, 65, 523-530.

_____. (1964). Operational definitions. *American Educational Research Journal*, 1, 183-201.

_____. (1962). A concept of critical thinking. *Harvard Educational Review*, 32, 81-111. Reprinted in B. Paul Komisar and C.J.B. Macmillan (Eds.), (1967), *Psychological concepts in education*. Chicago: Rand McNally and Company, pp. 114-148.

_____. (1961). Assumption-finding. In B.O. Smith & R.H. Ennis (Eds.), *Language and concepts in education*. Chicago: Rand McNally and Company . Pp. 161-178. Reprinted as (1971) La identificacion de supestos, in B. Othanel Smith and Robert H. Ennis (Eds.), *Lenguaje y conceptos en la educacion*, Buenos Aires: El Ateneo, pp. 177-194.

_____. (1959) The development of a critical thinking test. Unpublished doctoral dissertation, University of Illinois. University Microfilms #59-00505.

Harman, Gilbert (1973). *Thought*. Princeton, NJ: Princeton University Press.

Harman, Gilbert H. (1968). Enumerative induction as inference to best explanation. *The Journal of Philosophy*, 65 (18), pp. 529-533.

Harman, Gilbert (1965). The inference to best explanation. *The Philosophical Review*, LXXIV, 1 (January), pp. 88-95.

Hitchcock, David (1985). Enthymematic arguments. *Informal Logic*, vii, (2 and 3), pp. 83-97.

Lipton, Peter. (2004). *Inference to the best explanation*. London: Routledge.

Lewis, David (2000). Causation as influence. *The Journal of Philosophy* LXXXVII, 182-197.

Mackie, John L. (1994). *The cement of the universe*. Oxford: Clarendon Press.

Norris, Stephen & Robert H. Ennis. (1989). *Evaluating critical thinking*. Pacific Grove, CA: Midwest Publications.

Scheffler, Israel (1960). *The language of education*. Springfield, IL: Charles C Thomas.

Stevenson, Charles L. (1944). *Ethics and language*. New Haven: Yale University Press.

Woodward, James (2008). Causation and manipulability. *Stanford encyclopedia of philosophy*. <http://plato.stanford.edu/entries/causation-mani/>

NOTES.

1. This is the most recently revised version of a conception of critical thinking abilities and dispositions, earlier versions having appeared in Ennis (1959, 1962, 1980, 1987a, 1987b,

1991a, 1991b, 1996a, 1996b, 2002, 2011a, 2013, 2015) and in Norris & Ennis (1989). All fit under the general definition of critical thinking, "reasonable reflective thinking that is focused on deciding what to believe or do".

2. Organization and exact wording of critical thinking dispositions has been modified over the years in the direction of theoretical refinement and precision (Norris & Ennis, 1989; Ennis, 1987a, 1991a, 1996a, 1996b, and 2011a, 2013, 2015). But the presentation here is a return almost to the original, because it is simpler and more amenable to use in teaching.

3. The mention of truth in Disposition #11 calls for descriptions of types of constructivism. Radical epistemological constructivism holds that all supposed truths are constructed by us. Conservative epistemological constructivism (the view assumed in this definition/conception of critical thinking) holds that our concepts and terms are constructed by us, but also that (to oversimplify somewhat) the relationships among the referents of our concepts and terms are not constructed by us. We can have true or false beliefs about these. For example it is true that Chicago is north of Miami, though our concept of North, and the references of the words 'Chicago' and 'Miami', are decided (constructed) by human beings.

Pedagogical constructivism holds that students learn best when they construct their own answers to problems and questions: For some (but not all) goals and types of learning, this view has empirical support, but it should not be confused with either type of epistemological constructivism. In particular, the validity of pedagogical constructivism (to the extent that it is valid) does not imply the validity of either type of epistemological constructivism. Pedagogical and epistemological constructivism are totally different ideas, though they are sometimes conflated.

There is a vast literature about 'true', 'truth', and constructivism. The view here assumed is that we all use the words 'true' and 'truth' regularly in our daily lives, and that these words should be understood here in the same way we use and understand them in our daily lives.

4. "Auxiliary" abilities are those that are not constitutive of critical thinking, but helpful in doing it.