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What Critical Thinking Is

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Introduction

The modern "critical thinking" tradition has been developed by a number of leading thinkers, assisted by many others who have made contributions of their own. In this essay I will explain the ideas of these leading thinkers, showing how they have successively enriched the tradition whilst remaining true to its core ideas, with the result that we now have a rich and essentially coherent conception that can be used as a basis for designing lesson plans and for assessing critical thinking abilities. It is not uncommon for this core tradition to claim that Socrates was the originator of this approach to teaching and learning and this is worth remembering because it is clearly important to some of the contributors below and can help to maintain focus when questions arise.

1. John Dewey, "reflective" thinking (1909)

It is generally agreed that the modern critical thinking tradition derives from the work of the American philosopher, psychologist and educator, John Dewey (1859–1952). He called it "reflective thinking" and defined it as:

> Active, persistent, and careful consideration of a belief or supposed form of knowledge in the light of the grounds which support it and the further conclusions to which it tends. (Dewey, 1909, p. 9)

It is worth unpacking this definition because its elements have remained part of the core. Characteristically then, critical thinking involves "actively" subjecting the ideas we encounter to critical scrutiny, as distinct from just *passively accepting* them. For Dewey, and for everyone who has worked in this tradition subsequently, critical thinking is *essentially* an "active" process, one in which we think things through for ourselves, raise questions ourselves, find

relevant information ourselves, etc., rather than learning in a largely passive way from someone else.

Again, characteristically the critical thinker takes time to weigh matters carefully—to "persist" and be "careful"—by contrast with the kind of unreflective thinking in which we all engage sometimes, for example when we "jump" to a conclusion or make a "snap" decision. Of course, we have to do this sometimes because we need to decide quickly or the issue is not important enough to warrant careful thought, but often we do it when we ought to stop and think—when we ought to "persist" a bit.

However, the most important thing about Dewey's definition is what he says about the "grounds which support" a belief and the "further conclusions to which it tends". The critical thinking tradition attaches huge importance to reasoning, to giving reasons and to evaluating reasoning as well as possible, and to valuing this focus. Characteristically, the critical thinker tries to reason skillfully in thinking about issues, by contrast with those who are unreasonable, unreflective, biased or dogmatic. There is more to be said about the components of Dewey's definition, but skillful reasoning is a key element.

2. Edward Glaser, building on Dewey's ideas (1941)

In the late 1930s Edward Glaser conducted a famous experiment in teaching critical thinking and, to his credit, he wanted to assess whether his methods had been successful, so he designed (along with co-author Goodwin Watson) what has become the world's single most widely used test of critical thinking, the *Watson-Glaser Critical Thinking Appraisal.* Glaser's remarkable experiment was a model for critical thinkers in that he tried to assess whether his teaching approach had succeeded.

Glaser defined critical thinking as:

> (1) an attitude of being disposed to consider in a thoughtful way the problems and subjects that come within the range of one's experience; (2) knowledge of the methods of logical enquiry and reasoning; and (3) some skill in applying those methods. Critical thinking calls for a persistent effort to examine any belief or supposed form of knowledge in the light of the evidence that supports it and the further conclusions to which it tends. (Glaser, 1941, p. 5)

This definition clearly owes a lot to Dewey's original definition. Glaser refers to "evidence" in place of "grounds" but otherwise the second sentence is much the same. The first sentence speaks about an "attitude" or disposition to be thoughtful about problems and recognizes that one can apply what he calls "the methods of logical enquiry and reasoning" with more or less "skill". The tradition has picked up on both these elements, recognizing that critical thinking is partly a matter of having certain thinking skills, but is also a matter of

being disposed to use them (someone might be very skilled at, say, turning somersaults, but might not be disposed to do so).

Like many others who have worked in the critical thinking tradition, Glaser produces a list of the thinking skills that he sees as basic to or underlying critical thinking. In his case, these are the abilities:

(a) to recognize problems, (b) to find workable means for meeting those problems, (c) to gather and marshal pertinent information, (d) to recognize unstated assumptions and values, (e) to comprehend and use language with accuracy, clarity and discrimination, (f) to interpret data, (g) to appraise evidence and evaluate statements, (h) to recognize the existence of logical relationships between propositions, (i) to draw warranted conclusions and generalizations, (j) to put to test the generalizations and conclusions at which one arrives, (k) to reconstruct one's patterns of beliefs on the basis of wider experience; and (l) to render accurate judgments about specific things and qualities in everyday life. (Glaser, 1941, p. 6)

Much influenced by Dewey, Glaser also saw scientific thinking as a model of "reflective thinking", and this list is probably best understood as relating especially to scientific and similar thinking. It does, however, contain many elements that have been picked up by subsequent workers in the field. For more recent thinking see Facione (1990 and 2010) or Fisher and Scriven (1997, Chapter 3).

3. Robert Ennis and a widely used definition

Few people have contributed as much to the development of the critical thinking tradition as Robert Ennis. In 1962 he published a seminal paper "A Concept of Critical Thinking" and he has continued to contribute to the field ever since. His 1962 definition of critical thinking as "the correct assessing of statements" was too narrow and made no reference to critical thinking dispositions and habits of mind (see Siegel (1988) Ch.1 section 1), but he has developed many ideas in the field since then. The definition for which he is best known, and which has gained wide acceptance in the field, is:

Critical thinking is reasonable, reflective thinking that is focused on deciding what to believe or do. (See Norris and Ennis, 1989)

Again, the emphasis is on being "reasonable" and "reflective", which is in line with earlier definitions, but notice also that Ennis speaks of "deciding what to . . . do", which was not explicitly mentioned earlier. Since for Dewey the model of critical thinking was scientific thinking, he was largely concerned with what we believe, but on Ennis's conception deciding what to do is a proper part of critical thinking too; and one can do this with more or

less skill, with more or less reflection, more or less reasonably, etc. Although some people have criticized this definition, its meaning is clear and it has been very widely used.

Like Glaser, Ennis has produced increasingly developed lists of critical thinking abilities and dispositions (Ennis, 1996) and we shall return to the latest of these shortly.

4. Richard Paul, "strong" critical thinking and "thinking about your thinking"

For some forty years, working within the evolving tradition outlined so far, Richard Paul developed his ideas about critical thinking, notably by introducing ideas about "fair-mindedness" and "strong" critical thinking into the tradition. "Fair-mindedness" and "strong" critical thinking require that thinkers take assumptions and perspectives that are quite different from their own *just as seriously as their own*. This is not easy to do, but Paul's ideas have been influential and have contributed significantly to the development of the tradition.

Paul famously distinguished between "weak" and "strong" critical thinking. Both of these are to be contrasted with "uncritical thinking", which is simply not reasoning things through very well. People who think uncritically are not clarifying issues as they should, assessing assumptions and implications, giving and critiquing reasons, applying intellectual standards, expecting people to give reasons for their actions and beliefs and valuing this, etc. Most people will be uncritical thinkers in some domains of their lives but Paul believed that most people are uncritical in many domains of their lives.

By contrast, those who engage in what Paul calls "weak" critical thinking might be good at reasoning things through, but such people will use this skill only to pursue issues from their own perspective, to pursue their own interests (narrowly conceived), to defend their own position, and to serve their own ends, without questioning these—without subjecting their own beliefs, assumptions and presuppositions to scrutiny. Most of us will be "weak" critical thinkers some of the time.

Someone who engages in "strong" critical thinking will also display skill at reasoning things through—will clarify issues where necessary, will assess assumptions and implications, give relevant reasons, apply intellectual standards, etc. But such a person (as contrasted with both the uncritical and the weakly critical thinkers) will *not* simply use this skill narrowly *to defend* their own position and interests, but will also employ it just as readily *to scrutinise* their own thoughts, beliefs and actions, their own judgements about their interests, their own goals, their own perspectives, even their own "world view". They will give equally serious weight to the different beliefs, goals,

and assumptions, conflicting perspectives and opposing world views of others. In short, someone who engages in a good deal of strong critical thinking will live what Socrates called "the examined life", and this is Paul's ideal.[1]

Besides introducing the distinctive idea of "strong" critical thinking, Paul attached great importance to "thinking about one's thinking". Indeed Paul attaches such importance to it that some of his definitions (he has given several) look very different from the definitions given above because of the stress he puts on it. Here is an example:

> Critical thinking is that mode of thinking—about any subject, content or problem—in which the thinker improves the quality of his or her thinking by skillfully taking charge of the structures inherent in thinking and imposing intellectual standards upon them. (Paul, Fisher and Nosich, 1993, p. 4)

This definition is interesting because it draws attention to a feature of critical thinking on which teachers and researchers in the field seem to be largely agreed, that the only realistic way to develop one's critical thinking ability is through "thinking about one's thinking" (often called "metacognition"), and consciously aiming to improve it by reference to some model of good thinking in that domain.

Thus, for example, instead of (say) making a decision and then rationalizing it (as many of us often do) most scholars working in the critical thinking tradition agree that we should show students a good model of decision making: be clear what the problem is, think of alternative courses of action, work out the possible consequences of these and how likely they are, take objectives and values into account, come to a reasoned decision (see Swartz (1994) Chapter 2), then give them practice in using the model, self-consciously following it, then put them in real situations where they need to use it. The result should be that we can produce better thought-out, more reasonable decisions than most of us do in the absence of such practice.

5. Harvey Siegel: Being "appropriately moved by reasons" (1988)

During the 1980s more and more educators were becoming interested in critical thinking, in what it was and in how to teach it. Philosophers had long been prominent in developing the critical thinking movement and, in 1988, Harvey Siegel, a well-known philosopher of education, published an influential book called *Educating Reason*.

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[1] For a review of Paul's fair-mindedness test that brings out some problems with the idea, see Fisher and Scriven (1997) pp. 137-144.

Although he was building on the tradition as it existed then, when Siegel introduced what he called his "reasons" conception of critical thinking, he was mainly interested in what it is to be a critical *thinker*. On his account "To be a critical thinker is to be appropriately moved by reasons." For him this means not only being *skilled* at reasoning things through, but also being *disposed* to do so, having certain *habits of mind*, and *valuing* basing beliefs and decisions on reasons, even when this runs counter to your own self-interest (cf. Paul on "strong" critical thinking). Siegel puts it like this:

> In order to be a critical thinker, a person must have [not only skills in reasoning, but also] certain attitudes, dispositions, habits of mind and character traits, which together may be labelled the "critical attitude" or "critical spirit". … One who has a critical attitude has a certain *character* as well as certain skills: a character which is inclined to seek, and to base judgment and action upon, reasons; which rejects partiality and arbitrariness; which is committed to the objective evaluation of relevant evidence; and which values such aspects of critical thinking as intellectual honesty, justice to evidence, sympathetic and impartial consideration of interests, objectivity and impartiality. A critical attitude demands not simply an ability to seek reasons, but a commitment to do so; not simply an ability to judge impartially, but a willingness and desire to do so, even when impartial judgment runs counter to self-interest. … For the possessor of the critical attitude, nothing is immune from criticism, not even one's most deeply-held convictions. (*Educating Reason*, p. 39.)

As Siegel says, the implication of this conception is that education aiming at developing critical thinking

> is a complex business which must seek to foster a host of attitudes, emotions, dispositions, habits and character traits as well as a wide variety of reasoning skills. (*Ibid.*, p. 41.)

For Siegel, being a critical thinker is closely related to being a rational person; his is a very Socratic conception, as is Paul's. However, it is worth noting that Siegel criticises Paul's conception of strong critical thinking on the ground that either it implies a self-defeating relativism (the question is, "which principles can be used to adjudicate between world views?") or it requires just the kind of "atomistic thinking" that Paul himself criticises as being central to the "weak" critical thinking tradition.

Either way, interesting and suggestive as it undoubtedly is, Siegel's conception of the critical think*er* goes further in some respects than the core tradition and may run into problems similar to those Paul's conception of "strong" critical thinking runs into, so we now leave it and move on to another conception.

6. Matthew Lipman: "Philosophy for Children" and *Thinking in Education* (1991)

Matthew Lipman was a professor of philosophy at Columbia University in New York. In the course of his teaching, he became convinced that even his philosophy students had not learned to think adequately before entering university and he became interested in working out how to teach students to think more skilfully. He quickly came to the view that schools needed to teach thinking skills long before students reach university, and he became famous for developing the Philosophy for Children Program, which included such treasures as *Harry Stottlemeier's Discovery*, a series of lessons for eight year old children, which aims to teach them how to think better.

In 1991 Lipman published *Thinking in Education*, in which he explained his ideas about teaching critical thinking. After some remarks connecting wisdom, judgment and critical thinking, he defined critical thinking as follows:

> I will argue that critical thinking is *thinking* that (1) *facilitates judgment because it* (2) *relies on criteria*, (3) *is self-correcting, and* (4) *is sensitive to context.* (*Ibid.*, Ch. 6., p. 116.)

and he explains the connection between judgment and criteria as follows,

> We are also aware of a relationship between criteria and judgments, for a criterion is often defined as "a rule or principle utilized in the making of judgments". It seems reasonable to conclude, therefore, that there is some sort of logical connection between critical thinking and criteria and judgment. The connection, of course, is to be found in the fact that critical thinking is skilful thinking, and skills themselves cannot be defined without criteria by means of which allegedly skilful performances can be evaluated. So critical thinking is thinking that both employs criteria and can be assessed by appeal to criteria. (*Ibid.*, p. 116)

The element in Lipman's definition that is least familiar is part (4) "*is sensitive to context*". He explains that this involves attending to,

1. *Exceptional or irregular circumstances.* For example, we normally examine statements for truth or falsity independent of the character of the speaker. But in a court trial, the character of a witness may become a relevant consideration.
2. *Special limitations, contingencies, or constraints* wherein normally acceptable reasoning might find itself prohibited. An example is the rejection of certain Euclidean theorems, such as that parallel lines never meet, in non-Euclidean geometries.

3. *Overall configurations*. A remark taken out of context may seem to be fla-grantly in error, but in the light of the discourse taken as a whole it appears valid and proper, or vice versa. [Lengthy example given]
4. *The possibility that evidence is atypical*. An example is a case of over-gen-eralizing about national voter preferences based on a tiny regional sample of ethnically and occupationally homogeneous individuals.
5. *The possibility that some meanings do not translate from one context or domain to another*. There are terms and expressions for which there are no precise equivalents in other languages and whose meanings are therefore wholly context-specific. (*Ibid.*, pp. 121f.)

Lipman's account of what critical thinking is has not caught on with the wider critical thinking community and is rarely referred to, but his books and mate-rials for teaching philosophy/thinking to K-12 children have been very suc-cessful and contain many fascinating lesson plans which arise out of his basic conceptions.

7. Peter Facione: "Critical thinking: A statement of expert consensus for purposes of educational assessment and instruction" (1990)

Although Dewey, Glaser and the early Ennis had very little impact on educa-tional practices in schools and colleges, things began to change in the 1970s. America had been embroiled in the Vietnam War for many years, and wide-spread student protest against the war included complaining that their col-lege logic courses gave them no help in dealing with the arguments about the war. The philosopher, Howard Kahane, took these complaints seriously and in 1971 published his *Logic and Contemporary Rhetoric*, one of the first col-lege-level critical thinking texts, which became enormously influential. Inter-est in teaching reasoning skills, thinking skills of one kind and another, even "critical thinking" skills, began to mushroom and by the 1980s many schools and colleges throughout North America were becoming explicitly committed to teaching critical thinking skills and dispositions.

However, there was no very clear view about what these were or how to teach and assess them and because philosophers had been heavily involved in characterising critical thinking, in designing college level programmes, and in trying to get it infused into the K-12 curriculum, the American Philosophi-cal Association asked Peter Facione, himself a philosopher much involved in teaching and assessing critical thinking, to investigate the subject, in order to clarify what it was and how it should be taught and assessed.

To do this, Facione assembled a group of 46 educators who were agreed to be experts in critical thinking (including Ennis, Paul, Lipman and John-

son), and this group then used what is known as the Delphi Method to work towards a consensus view of what critical thinking is and what are its constituent skills and dispositions. The Delphi Method meant that participants shared their reasoned views with the rest, but did so anonymously under Facione's leadership (to avoid undue influence). He would circulate questions and views and would then pull together a summary of the responses before inviting further comments and responses; altogether he went through six rounds of consultation.

The report makes fascinating reading, partly because Facione did all he could to find consensus, but also because it is clear that there was still some disagreement among the participants.

Having said that, Facione did manage to articulate a consensus view about what critical thinking is (in terms both of its cognitive skills and its affective dispositions):

> We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. ……

> While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society. (Executive Summary p. 2)

As this "definition" says, the experts agreed that critical thinking has two elements: cognitive skills and affective dispositions, both of which need to be developed to produce critical thinkers.

The report says that the six skills of (1) interpretation, (2) analysis, (3) evaluation, (4) inference, (5) explanation and (6) self-regulation are "at the core of CT" and then details (over five pages) what these entail, whilst also emphasising that the appropriate "content knowledge" will always be required to arrive at rational judgements in any given domain.[2]

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[2] The complete American Philosophical Association Delphi Research Report is available as ERIC Doc. No.: ED315 423 and the "Executive Summary" of its findings are easily available on the web.

8. Scriven: The evaluative definition of critical thinking

One last definition, due to Michael Scriven, is worth reviewing. Scriven has argued that critical thinking is "an academic competency akin to reading and writing" and is similarly fundamental to much of our lives. He defines it thus:

> Critical thinking is skilled and active interpretation and evaluation of observations and communications, information and argumentation. (Fisher and Scriven, 1997, p. 21.)

Like others, he defines critical thinking as a "skilled" activity, and he does so because critical thinking has to meet certain standards (of clarity, relevance, reasonableness, fairness, etc.) and one may be *more* or *less* skilled at this. He defines critical thinking as an "active" process (by contrast with the *passive* process of just accepting what one reads, hears or observes), and he does this partly because it involves *questioning* and partly because of the important role played by *metacognition*—thinking about your own thinking. He includes "interpretation'' (of texts, speech, film, graphics, actions and even body language) because "like explanation, interpretation typically involves constructing and selecting the best of several alternatives [and it] is a crucial preliminary to drawing conclusions about complex claims". He includes "evaluation" because "this is the process of determining the merit, quality, worth, or value of something" and much critical thinking is concerned with evaluating the truth, probability or reliability of claims and the reasonableness of arguments, inferences, etc.

On Scriven's account, the objects of critical thinking are observations, communications, information and argumentation. He takes the term "information" to refer to factual claims (which may be false, lacking credibility, unreasonable, etc.) and the term "communications" to go beyond information to include questions (for example, "Do you favour affirmative action?"), commands, other linguistic utterances, signals, etc. (see Fisher and Scriven (1997). pp. 38, 39) and the term "argumentation" refers to material that presents reasons for some conclusion. Such argumentation may be explicit or implicit, hypothetical, dialectical or discursive (debates vs. intellectual exploration vs. proof) (*ibid.*, p. 44).

All that is fairly standard. However, the mention of "observations" is unusual. Scriven has long argued that "*observations*" may require critical thinking. For example, it may require considerable critical thinking to be sure what one has seen, heard, etc., either in weak light, or under the influence of strong emotions, or when apparently magical/paranormal things happen. Again, it may be quite hard to be sure what one has experienced, e.g., when

you hear a bump in the night (*ibid*., p. 57). Sherlock Holmes, a paradigmatic critical thinker, focused much of his thinking on the problem of how to interpret what he saw, or did not see (e.g., the dog that *didn't* bark in the night). Suppose one sees a TV news report, showing military film of a missile hitting its chosen target with great accuracy or suppose one views the brain scan of a stroke victim. Consider how much scope (and need) there is for critical thinking about what one has really seen—and not seen. Another good example is the way information is presented graphically; it looks as though the unemployment figures are suddenly much worse, but most of the vertical dimension of the graph has been cut off. And how do the figures normally move at this time of year—when many young people leave college and come on to the jobs market, etc.? There is plenty of room for and need for critical thinking in these cases too.

This is the last extension of the notion of critical thinking to which I here draw attention. I have run through this survey of definitions to give a sense of the development of the critical thinking tradition. It clearly has some core ideas, concerned with giving, evaluating and caring about *reasons*, but it has also developed from an idea based on a scientific model of thinking to one that includes *deciding what to do* and *critical observing* and *dispositions.* The critical thinking tradition has a core that has developed and changed to become the rich idea it is now.

9. The critical thinking skills, abilities or competencies

Many of those who have contributed to the development of the critical thinking tradition have produced lists of skills that are characteristic of the critical thinker. As I noted earlier, Edward Glaser, was the first to do this (1941 p. 6) but others who have produced such lists include Ennis (1962), (1987), (1991), (2011), Ennis and Norris (1989), Facione (1990), Paul (1992), Fisher and Scriven (1997), and others, so I shall now draw on the work which has been done by these pioneers, to produce a comprehensive list of critical thinking skills. Such a list is necessary to decide how to teach and how to assess critical thinking abilities (see Fisher and Scriven, pp. 85, 87).

I divide the skills into four basic groups.

9.1 Interpreting

These are basic skills (which may nonetheless be quite demanding) that one requires in order to be skillful in the higher-level activities mentioned below. Thus you may need to begin by being as clear as possible what the problem is, what is the question at issue, what is the author trying to convince the reader of, or what you observed. You will need to:

- understand and correctly articulate the meaning(s) of terms, expressions, sentences—perhaps also pictures/cartoons, graphs, signs, and other forms of presentation, etc.

- clarify and interpret expressions and ideas, by finding good or paradigm examples, drawing contrasts, specifying necessary and sufficient criteria, providing a paraphrase, providing analogies, etc.—to remove vagueness or ambiguity (*ibid*. p. 110).

Tests for active (or deep) understanding are typically requests to:

- identify what is implied by the material ("reading between the lines"); outline or summarize the material; translate it into other terms; extrapolate from it; to find the factual element in a highly emotional statement; to interpret correctly positions to which the interpreter is deeply opposed, etc. (*ibid*., p. 98).

Much of this is very similar to what Facione lists under "interpretation". The least familiar reference in the first paragraph of this section is to *what one observed*. It is often hard to be sure how to interpret what we see, hear, etc., on TV, at the scene of a crime, when viewing conditions are abnormal, etc. What we observe will sometimes require interpretation rather than reflex labelling or simple recognition (e.g., reasoned identification of a rare species of flower, bird or rock formation) and this may require skilful reasoning (*ibid*., p. 97).

9.2 Analyzing

Analysis in this context is essentially being clear about the reasoning involved in arguments of different kinds. These might aim to prove some claim, to support some explanation, to justify some decision, etc., and they might present evidence, use an analogy, proceed by comparing and contrasting alternatives, etc. (*ibid*., pp. 111-112). In short the process of analysis is about identifying the elements in a reasoned case, its conclusion(s) (including main conclusions), the reasons presented in support of its conclusions, any assumptions or presuppositions implicit in the case but not expressed, including relevant background information (which may be factual claims, definitions, value judgments, recommendations, explanations, etc.) and the intended and actual inferential relationships among sentences and expressions, (etc.).

So, the question is whether, given some written or spoken material (say a newspaper editorial or a political speech or graphical presentation), it presents a reason or reasons in support of some opinion, point of view or conclusion(s). Of course, one also needs to identify any material that is extraneous to the argument, material that does not belong to the argument but that might divert (for example, a phrase intended to trigger a sympathetic emotional

response that might induce an audience to agree with an opinion) (cf. Facione (1990), p. 7). Much of this section is similar to what Facione says about analysis (*ibid.*, pp. 7, 8)

Tests for this skill will typically ask the student to identify the conclusions and reasons presented for them, say what is assumed, identify similar patterns of reasoning, identify a flaw in reasoning, etc.

9.3 Evaluating

Several different kinds of evaluative activity are central to critical thinking. First, it is often necessary to make judgments about the relevance, acceptability, credibility or truth, of claims and assumptions that might be presented in words, graphs, pictures, etc. One might also need to judge the credibility of a witness, or other source.

A quite different activity is involved in evaluating inferences of different kinds. In general the question is whether the reasons genuinely support the conclusion and if so how strongly. Some reasoning is meant to be deductive/ conclusive, but much is not: it is meant to be persuasive in varying degrees from "beyond a reasonable doubt" to "reasonable in the circumstances". These different kinds of reasoning have to be evaluated by different standards. Some reasoning is analogical; some reasoning aims to give or justify explanations—sometimes causal explanations; some is intended to arrive at or justify decisions or recommendations. These all have to be evaluated in different ways. For example, with explanations the key question is often whether there are *other possible* explanations and whether these can be ruled out. With decisions or recommendations it is often crucial to look at alternatives and likely consequences. Some reasoning is based on hypothetical situations and this needs to be evaluated in distinctive ways. Some reasoning involves inferences to the merit (trustworthiness) of sources and procedures. These may identify individuals who might (or might not) be reliable authorities or they may be procedures (like using the polygraph or DNA) (*ibid., p. 99*). There are many different kinds of reasoning, which need to be evaluated in different ways, often by different criteria.

Of course, some reasoning is mistaken, fallacious, or unconvincing in various ways, and one needs to be alive to formal, informal and other fallacies if one is to evaluate reasoning successfully. Furthermore, reasoning may support its intended conclusion, but there may be further/additional considerations that weigh for or against a given conclusion and that need to be taken into account in evaluating the argument/ conclusion as a whole (i.e., additional information might weaken or strengthen the argument).

The process of evaluating reasoning often requires creativity and imagination. One may need to be imaginative about (i) alternative strategies for solv-

ing a problem, or (ii) alternatives when faced with making a decision, or (iii) alternative hypotheses to explain something, or (iv) alternative interpretations of an observation, or (v) a variety of plans to achieve some goal, or (vi) a number of suppositions regarding a question or issue, etc. One may also need to extrapolate—to project the possible consequences of decisions, positions, policies, theories, or beliefs to assist in evaluating them.

Much of this is similar to what Facione says under the headings "evaluation", "inference" and "explanation", though it is more compressed.[3]

9.4 Thinking about one's own thinking: Self-regulation

Perhaps the most important skill/disposition/habit of mind of all for the critical thinker is that of applying critical thinking principles and practices to one's own ideas and communications, in writing or speaking, etc. This sort of self-regulation can be the hardest thing to do, which is partly why the typical critical thinking writing test can be very revealing (Fisher and Scriven, p. 39).

Whether producing responses to others or simply trying to think critically about something—perhaps with a view to presenting it in some form (written, spoken, pictorial, like pictures used for advertising or propaganda purposes, charts, etc. (cf. *ibid.*, p.100))—the crucial requirement is to apply the same standards that apply to the communications of others to one's own presentations (*ibid.*, p. 100). One needs to engage in the same active scrutiny of one's own work that is applied to others. So there is a need to be as clear as possible about the problem being addressed. Reasoning should be based on starting points that are as clear and reliable as possible. There is a need to be imaginative about what "other considerations" (including objections) might be relevant to the case—what might strengthen or weaken the presentation being constructed. The advocate needs to think about his or her claims and assumptions and justify them if possible or if the audience will demand it. It's necessary to take into account opposing points of view as sympathetically as one would wish one's own point of view to be treated. One needs to be as sure as possible of the soundness of one's inferences, made or implied, the suitability of one's presentation for the audience, the clarity of the presentation, its power and so on (*ibid.*, pp. 103, 104). To do all this is not easy and may well benefit from external help such as dialogue and discussion (*ibid.*, p. 100). For example, in arguing for a given position, one should try to anticipate (possible) reasonable criticisms/objections and others can help supply them.

This section is similar to what Facione says on "self regulation".

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[3] For a vocabulary that can be helpful in connection with thinking about critical thinking, see Fisher and Scriven (1997) pp. 104-107.

10. Dispositions, habits of mind and values of a critical thinker

It is one thing to be skilled in some domain and another thing to display a tendency or disposition to use those skills. Though different in some respects, this is parallel to being courageous (funny, helpful or whatever) on a given occasion and being a courageous (funny, helpful or whatever) person. The critical thinker is someone who characteristically practices critical thinking. He or she does not simply display critical thinking skills in an examination but also characteristically deploys them in everyday situations or in the course of his or her work whenever good thinking matters.

Many of those who have worked in the critical thinking tradition have thought there was something very odd about having such thinking skills and not using them; indeed, if we look back at Glaser's definition, we see that he actually includes an "attitude of being disposed" to consider problems thoughtfully as part of his very definition of critical thinking.

For example, a skill in judging the credibility of evidence produces more reasonable beliefs than being rather more gullible—which is obviously better: one will be led astray less often and this is to one's advantage. So this skill is worth using whenever significant questions of credibility arise; it is valuable and it will pay to adopt the habit of using it, i.e., to be disposed to use it whenever it is appropriate.

There is no doubt that the critical thinking skills are generally valuable skills and having the habit of using them whenever it is appropriate will help in many ways, so the moral is that one should not just acquire the skills, but value them—and use them; in short become a critical *thinker*.

As Ennis has emphasized, there are some particular dispositions that are an important part of critical thinking—especially, being open-minded and trying to be well informed. The closed-minded person will lack the imagination so often essential to good critical thinking, and it is always important to try to be well-informed if one is to know what alternatives are realistic and worth considering, for example what alternative explanations need to be taken seriously when evaluating an explanation or what alternatives are realistic when faced with some decision.

It is widely agreed among the critical thinking community that it is not enough to teach the critical thinking skills mentioned above, but it is also very important to develop a range of dispositions or habits of mind if we are to develop critical think*ers*.

Facione, in his Delphi Report, lists what he calls the affective dispositions that the experts contributing to his report agreed were important for the critical thinker. Table 5 of the report (p. 13) spells these out:

Affective dispositions of critical thinking approaches to life and living in general:

- inquisitiveness with regard to a wide range of issues,
- concern to become and remain generally well-informed,
- alertness to opportunities to use CT,
- trust in the processes of reasoned inquiry,
- self-confidence in one's own ability to reason,
- open-mindedness regarding divergent world views,
- flexibility in considering alternatives and opinions,
- understanding of the opinions of other people,
- fair-mindedness in appraising reasoning,
- honesty in facing one's own biases, prejudices, stereotypes, egocentric or sociocentric tendencies,
- prudence in suspending, making or altering judgments,
- willingness to reconsider and revise views where honest reflection suggests that change is warranted.

Approaches to specific issues, questions or problems:

- clarity in stating the question or concern,
- orderliness in working with complexity,
- diligence in seeking relevant information,
- reasonableness in selecting and applying criteria,
- care in focusing attention on the concern at hand,
- persistence though difficulties are encountered,
- precision to the degree permitted by the subject and the circumstances.

It then discusses how these should be developed and the importance of teacher training for developing them.

11. "Critico-creative thinking": Critical thinking and being creative

Some people have preferred to use the term "critico-creative" thinking because the term "critical thinking" can sound "negative", as though one's only interest is in adversely criticizing other people's arguments and ideas. They want to emphasize the fact that to be good at evaluating arguments and ideas one often has to be imaginative and creative about other possibilities, alternative considerations, different options and so on. To be a good judge of issues it is not enough to see faults in what other people say; one needs to base that judgment on the best arguments one can devise (in the time available) and this often requires thinking of relevant considerations other than those presented, looking at issues from different points of view, imagining alterna-

tive scenarios and perhaps finding other relevant information; in short, one might need to be quite creative and imaginative.

The label "critico-creative" thinking is intended to stress these positive, imaginative aspects of critical thinking. Unfortunately the result is a rather unwieldy expression, and it has not caught on. So we continue to use the term "critical thinking" because it is now so widely used, whilst understanding it in this positive, imaginative sense. In this use it has the same sense in which one speaks, for example, of a theatre or film "critic"—as someone whose comments and judgments may be either positive or negative. In short, critical thinking is a kind of evaluative thinking that involves both criticism and creative thinking and that is particularly concerned with the quality of reasoning or argument which is presented in support of a belief or a course of action (see Fisher (2011) p. 14).

12. To conclude

The critical thinking tradition is a long one and is still developing. However, it is not too difficult to summarize the ideas contained in the tradition that we have just reviewed.

It is clear that critical thinking is contrasted with *unreflective* or *passive* thinking, the kind of thinking that occurs when someone jumps to a conclusion, or accepts some evidence, claim or decision at face value, without really thinking about it. It is a *skillful* activity, which may be done more or less well, and good critical thinking will meet various intellectual standards, like those of clarity, relevance, adequacy, coherence and so on. Critical thinking clearly requires the interpretation and evaluation of observations, communications and other sources of information. It also requires skill in thinking about assumptions, in asking pertinent questions, in drawing out implications—that is to say, in reasoning and arguing issues through. Furthermore, the critical thinker believes that there are many situations in which the best way to decide what to believe or do is to employ this kind of reasoned and reflective thinking and thus tends to use these methods whenever they are appropriate.

Does this attitude imply that there is just one correct way to think about any given problem? No. But it does imply that most of us could do it better than we do (that is, more skillfully/ reasonably/ rationally), if we asked the right questions. This tradition is all about improving our own thinking by considering how we think in various contexts now, seeing a better model and trying to move our own practice towards that better model. It does not imply that there is just one correct way of thinking that we should try to emulate, but that there are better ways of thinking than we often exhibit and that our poor thinking can be at least partially remedied by suitable practice.

Finally, it is worth pointing out that not all "good" thinking counts as critical thinking. For example, there is much routine thinking, speedy thinking, creative thinking, and more, which does not count as critical thinking. If one aims to interpret a claim or evaluate an argument one will often have to think of alternative interpretations or arguments. This is a creative activity (Fisher and Scriven pp. 66, 67) but quite different from literary or poetic creativity. Equally, plodding or straightforward reasoning (as when you solve a routine mathematical problem in a standard, well-learned way) is not critical thinking. Critical thinking only occurs when the reasoning, interpretation or evaluation is challenging and non-routine (*ibid.,* p. 72). Again, if you are working out an explanation this may well involve critical thinking, but if you are explaining something familiar to a third party it might not at all. Various other skills are excluded from being called critical thinking skills on our conception, for example being observant or watchful is different from critical observing, etc. (*ibid.,* pp. 94–96). The critical thinking tradition is rich and complex but understanding it and working within it pays tremendous dividends and is well worth the effort.

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Alec Fisher pioneered the development of critical thinking in the United Kingdom. He taught philosophy, logic and critical thinking in the University of East Anglia, Norwich, UK, where he was Director of the *Centre for Research in Critical Thinking.* He has conducted workshops on critical thinking in Britain, Europe. North America, South America, South Africa, Russia, and the Far East. He designed the *AS level examination in Critical Thinking* for OCR in the UK and was Chief Examiner for some years. His books include *The Logic of Real Arguments* (Cambridge University Press, 1988 and 2004), *Critical Thinking; Its Definition and Assessment* (Centre for Research in Critical Thinking and Edgepress 1997, co-authored with Michael Scriven) and *Critical Thinking: An Introduction* (Cambridge University Press, 2001 and 2011). He recently completed (with Michael Scriven and Robert Ennis) a report for the (US) Law School Admission Council, recommending changes to the Law School Admission Test.