Critical Thinking: A Streamlined Conception

ROBERT ENNIS
University of Illinois

In the past decade explicit official interest in critical thinking instruction has increased manyfold. An example: The Board of Officers of the American Philosophical Association (APA) issued a statement urging that in the areas of critical thinking curricula and testing, professional philosophers offer their services to and be consulted by educational authorities (APA, 1985, p. 484). Another example: The APA Committee on Pre-College Philosophy developed a list (available from the APA central office) of about six hundred philosophers recommended for critical thinking consulting, and is formulating an approach to critical thinking testing. Another: The California State University system has in its adoption of "Executive Order 338" required that all students study critical thinking in order to graduate from its units. A final one: College Board (1983) has deemed critical thinking (there called "reasoning") to be one of the seven basic academic competencies. These are but a few of many examples.

But what is this critical thinking, in the development of which philosophers are asked—and are volunteering—to help, and the teaching of which they often undertake? In this essay I suggest and explain a usable answer to this question. It is usable as a comprehensive guide to the incorporation of critical thinking into various subject-matter areas in an overall curriculum plan of a school system or a college, as a guide to the content of a separate critical thinking course, and as a guide to the assessment of any such curriculum or course. Furthermore it can serve as a point of departure or contrast for other attempts to do the same thing.

Many details are omitted in order to provide a broad view, and the answers to some philosophically disputed issues are assumed. But the proposed conception has at least these three advantages:

1) Because it is grounded on an analysis of the important elements in making a decision about what to believe or do, there is a basis for deciding whether the conception is balanced, sufficiently specific, comprehensive, and relevant. Some approaches to critical thinking offer haphazard assortments, vague characterizations, or single-minded emphases.

2) It has evolved over the past thirty years (Ennis, 1962, 1969, 1980, 1981a, 1987a, 1987b) in the light of comments by philosophers and teachers (e.g., Brell, 1990; McPeck, 1981; Norris, 1985; Rogers, 1990; Seigel, 1988; and

Siegel & Carey, 1989) and in the light of its being applied to many many examples and its being used in many teaching situations. This streamlined conception is better organized, is more readily grasped, and has fewer redundancies and omissions than did the original conception (1962). But most importantly, given the impact that such a conception can have on teaching, it provides more explicit emphases on the importance of knowledge in the area in which the thinking occurs, and on the importance of critical thinking dispositions (in contrast to critical thinking abilities). These emphases were there originally, but needed greater prominence.

3) This conception still emphasizes criteria for making judgments, though only a few are mentioned in this synoptic essay (See the versions cited above and especially Ennis, in press, for elaboration of these criteria.) Criteria, though they are often only rough guides, are needed so that we can give students guidance in making judgments, and so that we will have a basis for our own judgments in assessing students' critical thinking dispositions and abilities. Some attempts to conceptualize critical thinking neglect criteria for making judgments.

"Critical Thinking" Defined

"Critical thinking," as I think the term is generally used, roughly means *reasonable reflective thinking that is focused on deciding what to believe or do.* Note that this definition does not exclude creative thinking. Creative acts, such as formulating hypotheses, alternative ways of viewing a problem, questions, possible solutions, and plans for investigating something, come under this definition. But the definition does emphasize reflection, reasonableness (interpreted roughly as rationality), and decision-making (about belief and action).

Critical thinking, frequently compared with problem solving, is by this definition an important part of the process of problem solving. Unfortunately this fact is not very informative about the nature of critical thinking, because problem solving has assumed many guises, and its proponents have emphasized different things.

As it stands, this concept of critical thinking, which I have derived in my informal empirical way from the central features in the usage of people who employ the term, does not provide sufficient guidance for teaching and curriculum decisions. It does not tell us what criteria, dispositions, or abilities to teach in a critical thinking course or a critical thinking emphasis within another course, nor does it tell us what to assess in a critical thinking test. So the concept needs to be fleshed out. I shall attempt to do so in terms of a more-detailed conception of the ideal critical thinker, assuming that a critical thinker is one who tends to think critically.

Concept and Conception. I have just used the distinction between 'concept' and 'conception' that I learned from John Rawls (1971). As I am employing

this distinction, a concept is the non-controversial meaning of a term—the meaning upon which well-informed able speakers of the language would roughly agree. (However, I am not claiming that the concept offered here is in fact non-controversial, only that I am trying to provide a non-controversial concept.) If the concept is value-laden, then an associated conception gives more specific content to the concept's value terms. Conceptions are more likely to be controversial than concepts and thus generally to require defense.

The Decision-Making Process. Here is a rough sketch of the assumed decision-making process underlying the conception: Decisions about belief or action generally occur in the context of some problem and should have some basis. This basis can consist of observations, statements made by some source, and/or some previously-accepted propositions. On this basis an inference to a decision is made. Such inferences can be of three basic kinds: inductive, deductive, and value judging (as process, not product). In making and checking the decision the inferrer should exercise a group of critical thinking dispositions (soon to be listed), should be clear about what is going on, and be able to suppose other points of view. A defense of the decision should always be available, and often must be presented to others, orally or in writing. These elements appear in Figure 1.

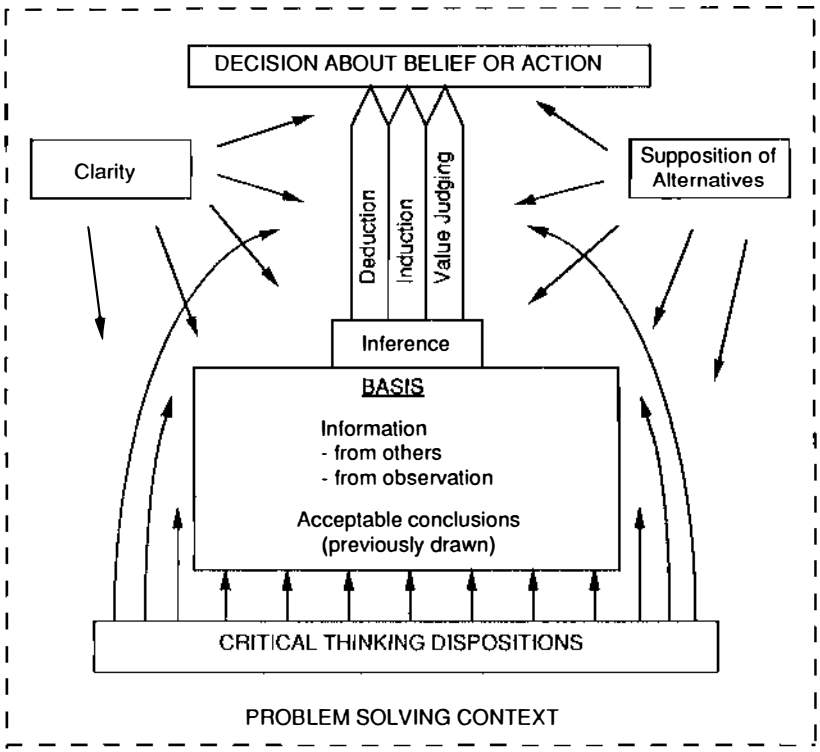

Figure 1. Critical Thinking: A Streamlined Conception

Philosophical Disclaimers and Assumptions Not Here Defended. This view of critical thinking assumes without argument rough distinctions between factual and value claims and among the three types of inference mentioned. The view does not assume foundationalism in epistemology, and does assume observation to be theory-laden.

Major Characteristics of the Ideal Critical Thinker. Given this rough view, Table 1 provides an outline of this proposed streamlined conception of the ideal critical thinker. This outline could serve as a checklist for a critical thinking curriculum, as a set of specifications for a critical thinking test, and—with some rearrangement—as a topic outline for a separate critical thinking text or course. It is not offered as an elegant theory of critical thinking. Rather it is intended to be a useful guide to educational decisions.

Table 1: A Characterization Of The Ideal Critical Thinker

Working Definition: 'Critical thinking' means reasonable reflective thinking that is focused on deciding what to believe or do.

Given this definition, the ideal critical thinker can be roughly characterized by the following interdependent and somewhat-overlapping set of twelve dispositions and sixteen abilities. All twelve dispositions and the first twelve abilities are offered as constitutive of the ideal critical thinker. The last four abilities (here called "auxiliary abilities") are helpful and generally needed by the ideal critical thinker.

A. *Dispositions* of the ideal critical thinker:

1. to be clear about the intended meaning of what is said, written, or otherwise communicated
2. to determine and maintain focus on the conclusion or question
3. to take into account the total situation
4. to seek and offer reasons
5. to try to be well informed
6. to look for alternatives
7. to seek as much precision as the situation requires
8. to try to be reflectively aware of one's own basic beliefs
9. to be open-minded: consider seriously other points of view than one's own
10. to withhold judgment when the evidence and reasons are insufficient
11. to take a position (and change a position) when the evidence and reasons are sufficient to do so
12. to use one's critical thinking abilities

Abilities of the ideal critical thinker:

(The first five items involve *clarification*.)

1. to identify the focus: the issue, question, or conclusion
2. to analyze arguments
3. to ask and answer questions of clarification and/or challenge
4. to define terms, judge definitions, and deal with equivocation
5. to identify unstated assumptions

(The next two involve the *basis* for the decision.)

6. to judge the credibility of a source
7. to observe, and judge observation reports

(The next three involve *inference*.)

8. to deduce, and judge deductions
9. to induce, and judge inductions
   a. to generalizations
   b. to explanatory conclusions (including hypotheses)
10. to make and judge value judgments

(The next two are *metacognitive* abilities—involving *supposition* and *integration*.)

11. to 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 thinking ("suppositional thinking")
12. to integrate the other abilities and dispositions in making and defending a decision

(The next four are *auxiliary critical thinking abilities*—having them is not constitutive of being a critical thinker.)

13. to proceed in an orderly manner appropriate to the situation, for example,
    a. to follow problem solving steps
    b. to monitor one's own thinking
    c. to employ a reasonable critical thinking checklist
14. to be sensitive to the feelings, level of knowledge, and degree of sophistication of others
15. to employ appropriate rhetorical strategies in discussion and presentation (orally and in writing)
16. to employ and react to "fallacy" labels in an appropriate manner

Table 1: Notes

1. This is only a critical thinking content outline. It does not specify level, curriculum sequence, emphasis, or type of content involved (standard subject-

matter content, general knowledge, special knowledge, etc.). These topics are considered in Ennis (1985, 1987b, and 1989).

2. If th is outline is used as a sequence for a separate critical thinking course, the definitional and assumption-identification abilities would probably come later than indicated, because of their difficulty. In any course, whether separate or not, all of the dispositions, the suppositional and integrational abilities (#11 and #12), and auxiliary abilities #13 through #15 would permeate the course.

3. In a more elegant characterization there would be a specific ability to correspond to each disposition, and *vice versa* (the ability to seek and offer reasons, as a counterpart to the disposition to do so), but that would be overly elaborate for this situation. The requisite abilities either are specified, are composites of those specified, or are obvious enough to be incorporated in a course or curriculum in conjunction with the disposition. That should suffice for the practical purposes of this characterization.

In the remainder of this essay I shall exemplify and elaborate these dispositions and abilities, and shall refer to attempts elsewhere to defend and explain certain points.

Exemplification and Elaboration

A main source of examples is my experience as a juror for a murder trial, an experience that demonstrates the applicability and importance of the dispositions and abilities that comprise this conception of the ideal critical thinker. All the listed dispositions and abilities were needed by us jurors.

The fact that this experience is not everyone's everyday experience does not diminish its use for my purposes. Examples are inevitably unique to some degree, but all the real decision-making ones that I have examined similarly show the applicability of these dispositions and abilities. I have used this example before, but here use it to bring out to a much greater extent than before the importance of the critical thinking dispositions.

In this trial the defendant, a young woman, was charged with murdering her boyfriend late on a cold winter night in her parents' kitchen. Very soon after she and he entered the house through the back door she stabbed him through the heart with a knife that was probably lying on the counter. She ran to her parents' bedroom and awakened them, whereupon they called an ambulance. The victim was dead when the ambulance arrived. The defendant's attorney contended that the killing was done in self defense.

Although the defendant was charged with voluntary manslaughter as well as murder, I shall simplify this presentation by specifying in full only the nature of the charge of murder in the terms that were given to us jurors (The first and third conditions for murder were also conditions for voluntary manslaughter.):

To sustain the charge of Murder, the State must prove the following propositions:

First: That the Defendant performed the acts which caused the death of the Victim, and

Second: That when the Defendant did so she intended to kill or do great bodily harm to the Victim, or she knew that her acts would cause death or great bodily harm to the Victim, or she knew that her acts created a strong probability of death or great bodily harm to the Victim, and

Third: that the Defendant was not justified in using the force which she used.

If you find from your consideration of all the evidence that each of these propositions has been proved beyond a reasonable doubt, then you should find the Defendant guilty.

If, on the other hand, you find from your consideration of all the evidence that any of these propositions has not been proven beyond a reasonable doubt, then you should find the Defendant not guilty.

Critical Thinking Dispositions

1. *Clarity*. The first listed disposition is to be clear about the intended meaning of what is said or written. In this case it was important for us to be disposed to be clear about the intended meaning of the charge of murder as it was presented to us. If we had not been clear about it, we might have assumed, as many people do, that murder requires intent to kill, but this particular charge does not so require. We also had to be clear that the state had to prove its case beyond a reasonable doubt, and we had to be clear about the relationships among the various parts of the murder charge. In particular we had to be clear that there were three necessary conditions for murder, and that the second (in the simplest way of looking at it) was composed of six conditions, any one of which was sufficient for the establishment of the second necessary condition, but at least one of which was necessary for its establishment. (As it turned out, we found her innocent of murder because we felt that the state had not proved beyond a reasonable doubt that any of these six conditions held.)

But this clarity disposition had a more sophisticated application. In our situation, proof was the basic concern. More precisely, did we have proof beyond a reasonable doubt? But some jurors were operating as if our standard were the less-stringent one, strong-enough-support-so-that-it-would-be-implausible-to-think-otherwise. And one juror was operating as if our standard were logical necessity. Assuming either of these alternative interpretations of proof would have resulted in different verdicts than the ones we produced, but all three standards passed under the name, 'proof' in that situation. Subtle unstated differences like

this call for the operation of this disposition at a sophisticated level: trying to be clear about the intended meaning and nuances of meaning in a developing discussion or argument.

2. *Focus.* The second listed disposition is to determine and maintain focus on the conclusion or question. In our situation it was important for us to focus on the question, "Is she guilty of murder?" Given the situation it was easy to determine the question, though we found it less easy to maintain focus on it. One crucial subquestion that became a main question was less easy to determine. It was whether she knew that her acts created a strong probability of great bodily harm to the victim (the last condition in the second necessary condition). As further application of the first disposition (the disposition to be clear about what is said or written), it was important for us to try to be clear about the intended meaning of this subquestion. Some jurors first thought it to be whether her acts actually created a strong probability of great bodily harm, rather than whether she knew this.

The disposition to maintain the focus was evidenced by our methodically going through the conditions for murder and voluntary manslaughter. It was also evidenced by some of us when we responded to a juror who thought that the body was probably moved by someone before the photograph of the victim was taken. We (exercising the fourth disposition regarding reasons) asked what was his reason for thinking so, and (exercising the focus disposition) asked what was its relevance to the case, if true.

3. *Total Situation.* The disposition to take into account the total situation was evidenced by some of us when we reminded others on the jury that in this situation the standard for proof was "proof beyond a reasonable doubt." It was also evidenced when we decided that the third criterion was satisfied, reasoning as follows: In that situation the defendant had as an alternative to stabbing him (we suddenly realized when we stepped back to look at the total situation), even if he had threatened her, an escape to her parents' room. So we concluded that she was not justified in using the force which she used. Another feature of the situation that we realized and took into account was that the victim had sufficient opportunity, even before they entered the house, to damage her, if he had, as she claimed, intended to do so. The prosecuting attorney did not mention this feature of the situation. We figured it out.

4. *Reasons.* The fourth disposition is to seek and offer reasons. We jurors often exhibited this disposition. When one said at the beginning of our deliberations, "She's guilty," the others asked why. He gave his reasons, and the interaction continued. Without reasons, it is much more difficult to make a reasonable decision. (This is not circular. 'Reason' is a descriptive term; 'reasonable' is an evaluative term.)

5. *Trying to Be Well Informed.* The fifth disposition, to try to be well

informed, was well evidenced by the jurors. We listened intently at the trial. When in doubt during the post-trial deliberations, we would ask each other what happened at the trial, and make sure that we were confident with the result before proceeding. As a group we always seemed able to remember what had happened, even if one had forgotten.

6. *Alternatives*. The sixth disposition asks us to look for alternatives. We did this in a way that made all the difference in that situation when we realized that the defendant had another alternative—escape to her parents' room. It was this realization that resulted in our judging her guilty of voluntary manslaughter, the crucial condition for which was the same as the third condition for murder. Our realization of the existence of this alternative led us to judge that she was not justified in using the force that she used.

When asked what aspect of critical thinking I would choose to emphasize in teaching, if I have to pick only one, I pick this one. This is because I have seen so many cases in which this disposition was crucial, and because it does overlap with a number of other dispositions (like open-mindedness). Its successful exercise also requires the *ability* to see or formulate alternatives, which is a key feature in all three types of inference.

7. *Precision*. The disposition to seek as much precision as the situation requires was evidenced when the pathologist acted out the strength of the knife stroke, as she reconstructed it from the measured depth of the wound. She moved her hand saying that the stroke was "moderate, like this." Then she moved her hand much more vigorously, saying "not strong, like this." The pathologist had sought a degree of precision required for the situation. Numbers giving amounts of kinetic energy or velocity would have been overprecise and less helpful.

8. *Self-Awareness*. The disposition to try to be reflectively aware of one's own basic beliefs is one that Richard Paul (1987) rightfully emphasizes. In our case we unfortunately did not bring to the surface a value judgment we assumed in deciding that she was not justified in using the force that she used. We assumed that when there is a peaceful alternative available, a person threatened with physical violence should pursue it. But some of my feminist friends have since objected that women should stop fleeing in the face of violence from men, and when a forceful option is open to them, they should take it—and not flee. In this particular case, they urged, if the victim was chasing the defendant, she would have been justified in stabbing him.

9. *Open-Mindedness*. The disposition to be open-minded, considering seriously other points of view than one's own, is also emphasized by Richard Paul (1987). Although we were disposed to do so, the jury did not actually succeed in doing this with respect to the value judgment mentioned in the previous paragraph. We unconsciously assumed that

peaceful flight was the way to handle the defendant's situation. However, we did seriously consider the defendant's stated point of view that she was being attacked by the victim. We seriously considered this in the face of a large body of evidence suggesting otherwise. One of the jurors was particularly at pains to make sure that we realized that she might have been under attack, and to make sure that we worked out the consequences of that possibility.

10. *Caution.* The disposition to withhold judgment when the evidence and reasons are insufficient is obviously an important one for jurors. Otherwise unwarranted convictions would result.

11. *Non-Skepticism.* The disposition to take a position (and change a position) when the evidence and reasons are sufficient is also necessary for jurors. Otherwise people get frozen into a position or into inaction, as the case may be. A few of our jurors started out convinced of the defendant's guilt without even seeing the nature of the murder charge that we were given. Fortunately they were willing to change their position in the face of the evidence. Another juror started out unwilling to take any position. He was a classic skeptic, requiring logical necessity for proof. Following his line no convictions would ever occur. When faced with this consequence, he relented however.

12. *Using One's Abilities.* The disposition to use one's critical thinking abilities is an important one. It avails little to have critical thinking abilities, if we do not use them.

Overview. From this set of examples it can be seen that these dispositions are important qualities. It can also be seen that the items on the list are not mutually exclusive. They overlap and are interdependent. Even so, it is worthwhile to attend to them separately on occasion and to seek their acquisition by or strengthening in our students, not easy things to do directly. However, modeling, considering examples, and engaging students in issues that are real to them are useful approaches to the promotion of these dispositions.

Critical Thinking Abilities

The first five listed abilities are primarily concerned with clarification. Unless we are clear about what is going on, it is difficult to react, to propose, to judge.

1. *Focus.* The ability to identify the focus (the issue, question, or conclusion) is listed first because, unless we know the focus, we do not know what to do with the rest. We jurors knew the main focus: whether or not the defendant committed murder and voluntary manslaughter. It was easy to identify in that situation, because we were explicitly told the issue to which we should address ourselves. But identifying the focus is not always so easy. In deciding whether the second necessary condition for murder was satisfied, it was more difficult to identify a focus. We had to

focus on each of the six possibilities in turn, and then narrow the discussion down to a focus on the last condition. This required an ability to deal with the concepts, though not necessarily the language, of necessary and sufficient conditions.

2. *Argument Analysis.* The written murder charge made it easier for us to analyze the prosecutor's argument for murder, but we still needed to be able to see how the parts fit together. We had to be able to see that each of the three major conditions was a necessary condition, and that the prosecutor had to show this. When the defense attorney was arguing that none of the six conditions for the second necessary condition had been proved beyond a reasonable doubt, we had to be able to pick out this conclusion, and see how it bore on the total charge for murder. And we had to be able to see that he was trying to show that since the blow was only of moderate force, it had not been proved beyond a reasonable doubt that the defendant *knew* that there was a *strong probability* of great bodily harm.

3. *Questions.* On numerous occasions we had to be able to ask questions of clarification or challenge. Examples: the crucial critical thinking question, "Why?," that we asked of the juror who was sure that she was guilty of murder before the deliberations started; and the question, "What does 'proof beyond a reasonable doubt' mean?," the asking of which required the interruption of the judge at his home.

4. *Definition.* The most troublesome problem was the meaning of 'proof beyond a reasonable doubt.' At one point in the deliberations about voluntary manslaughter it was generally agreed that the State needed to have proved beyond a reasonable doubt the proposition that the defendant was not acting in self defense. For if she had been acting in self defense, then, we assumed, she might well have been justified in using the force she used. (The last condition for murder was also the last condition for voluntary manslaughter.) Several jurors felt that without knowing the meaning of 'proof beyond a reasonable doubt' we could not decide about this necessary condition for voluntary manslaughter. Deliberations were about to collapse when the judge sent back the message to the effect that there is no definition of that phrase; do the best we can.

At this point I offered a definition that enabled us to proceed. With slight improvements I have since added, it went something like this: "To prove a proposition beyond a reasonable doubt is to offer enough evidence in its support that it would not make good sense to deny that proposition." Perhaps the jurors accepted my word because they knew I was a teacher of logic and critical thinking. The form I used, 'equivalent-expression' (sometimes called "contextual"), seemed more appropriate than the more common 'classification' form (sometimes called "genus-differentia"). The definitional act that I was performing, reporting a meaning, seemed appropriate for the situation, since standard usage in

that context was what the jurors needed. The definition made the jurors comfortable (though it really gave them no new information) so we were able to proceed with the discussion. See Ennis (1969) for the distinction between definitional form and act/function.

5. *Assumptions*. One assumption that we made but did not identify was the one to the effect that it is better to flee than respond with violence, an assumption that I indicated has since been challenged by some associates. One juror identified the assumption of another when he said, "You're assuming that I have to prove that she was defending herself against attack. Rather, the State has to prove that she was not." An assumption of the skeptical juror that I identified was that proof requires logical necessity. These examples illustrate the importance of the ability to identify assumptions in that situation. See Ennis (1982) for an extended discussion of the identification or attribution of unstated assumptions.

6. *Credibility*. We had to judge the credibility of all the witnesses, including that of the pathologist who judged that the knife blow was only moderate in force, and the defendant herself who said that she was defending herself against attack. See Ennis (1974) for a discussion of credibility.

7. *Observation*. We also had to judge whether to accept the observations on which the pathologist based her judgment: the measurement of the depth of the wound, and the observation that there were no marks on the bones. We judged the observation statements made by the investigating detective about the position of the body and the location and condition of the knife. All of the reports of these observations by professionals were based on a written record they made themselves at the time of the observation, according to their testimony. The facts that there were records, that they were made at the time, and that they were made by the same person doing the reporting of the observation all added to the believability of the reports.

We had to make our own observations as well and needed to observe with care. For example we observed the room in which the killing took place, and used this information to form our own judgment about the truth of the defendant's statements about the way that she swung at the victim. See Norris & King (1984) for a discussion of observation.

8. *Deduction*. We needed and used some deductive understanding in interpreting and applying the charge for murder. We also used it in reasoning to the conclusion that she was not under attack. We reasoned that if the victim had intended to harm her, he would have done so outside the house. But he did not do so. So he did not intend to harm her, most of us concluded. However, we felt that this reasoning did not yield proof beyond a reasonable doubt, because we felt that the first premise, the conditional, was not established beyond a reasonable doubt.

A mistake made by one juror seemed to me to be in the area of deduction. He asked a reluctant juror, "Have you proved beyond a reasonable doubt that she was justified in using the force that she used?" The answer was negative. The eager juror then said, "So that shows that she was not justified." This mistake might be classified by some as the 'either-or' fallacy, and by others as the illicit shifting of a negation. But there is an error, which to me has the flavor of not seeing that there are other logical possibilities, a basic deductive skill. See Ennis (1981b) for a discussion of deductive logic competence and Skyrms (1966), Hitchcock (1980), and Ennis (1989b) for interpretation and defense of the inductive-deductive distinction in informal logic.

9. *Induction.* Inductive inference includes simple generalizing, as well as inferring to hypotheses that are supposed to explain the facts. (See Ennis, 1968, for a defense of the distinction between generalization and inference to the best explanation.) One generalization that we jurors drew was that the bailiff's behavior was non-responsive. On this generalization we based our decision to stop asking him for help. The prohibition against hearsay evidence that was prominent in the trial is at least in part based upon a generalization: hearsay is often unreliable.

The other type of inductive inference is inference to hypotheses that are supposed to explain the facts ("best-explanation inference"). The pathologist in the trial inferred that the knife blow was only moderate in force. Part of her argument for this conclusion was that it *explained* why the depth of the wound was only 2 1/2 inches. Secondly there were no known facts that were inconsistent with the conclusion. Thirdly alternative possible explanations were inconsistent with the facts. For example, the proposition that the blow was severe was inconsistent with the fact that the depth was only 2 1/2 inches together with the fact that there were no marks on the chest bones. Lastly the proposed conclusion was plausible. Thus this conclusion satisfied what seem to be the four basic criteria for best explanation conclusions:

1) The conclusion should explain some facts.
2) The conclusion should not be inconsistent with any facts.
3) Competitive explanations should be inconsistent with some facts ("no plausible alternative explanations").
4) The conclusion should be plausible. (Satisfaction of this criterion is desirable, but not essential.)

In this example I have been emphasizing a practical critical thinking situation that is not one that most students have studied in their classes. That is, it is not part of the subject matter that most of us encounter in school or college. But I do not wish to demean background knowledge of the area in which the critical thinking occurs. For example it took an expert, the pathologist, to determine how difficult it is to slice through 2 1/2 inches

of human flesh. We had no experience with that sort of thing. And the pathologist was better able than we to decide whether the conclusion was on the whole plausible. That sort of judgment requires experience and knowledge of the general area.

Background knowledge is absolutely essential for critical thinking. We jurors had quite a large amount of the background knowledge that was required in the trial from dealing with all sorts of people in situations in our daily lives. But we needed the expert's knowledge about knife wounds. So there we had to combine the criteria for credibility and the criteria for best-explanation inference.

To exhibit the wide applicability of best-explanation inference I should like next to offer an example from English literature: A. C. Bradley's (1937) discussion of the character, Iago, in Shakespeare's *Othello*. Bradley contended that Iago was not the melodramatic villain that he was at one time so commonly presented to be. In part of the argument as I reconstruct it, the first stage is deductive: If Iago were a melodramatic villain, then his wife, Emilia, would have suspected him of being a villain. But she did not suspect him of being a villain. Hence he was not a melodramatic villain.

One of the premises of this deductive argument is that Emilia did not suspect Iago of being a villain. The argument for this premise is a best-explanation inductive argument, in which the selected premise of the deductive argument is the conclusion of the inductive argument.

The conclusion of the best-explanation inductive argument, that Emilia did not suspect Iago of being a villain, explains a number of facts: that she did not show suspicion of Iago when Othello exhibited agitation about the absent handkerchief; that the tone of Emilia's speeches did not suggest that she thought Iago to be a villain, though she thought that there must have been a villain at work; that she showed evidence of severe shock when presented with clear proof of Iago's villainy; and that she displayed choking indignation and desperate hope when she appealed to Iago to prove that he was not a villain. Readers unfamiliar with the play might not feel comfortable with these explanations, but this would at least in part be because familiarity with the subject matter is a crucial part of thinking critically.

Bradley in addition explained away some possible inconsistencies between the conclusion and some facts, argued that the leading alternative (that Iago was a melodramatic villain) was inconsistent with the facts, and made the conclusion seem plausible. Bradley's work on this topic appears then to satisfy the four criteria for a best-explanation argument, so his argument and conclusion seem acceptable. But my main point is to show that it makes good sense to judge this crucial stage of his argument as a best-explanation argument.

This example from English literature, for which I am indebted to

Bruce Warner, illustrates the oft-neglected point that best-explanation inference is widely applicable. It is not limited to physical events, and is frequently used in the humanities. See Follesdal (1979) for a similar claim, using *Peer Gynt* as the example.

10. *Value Judgment.* Making defensible value judgments is the last of these three basic types of inference. As I indicated earlier, we assumed the value judgment that it is better to flee than respond with violence, but we did not reflect upon this value assumption. Value judging is a particularly difficult area for critical thinking instruction, because of controversy over how to make defensible value judgments. But its importance requires that it not be neglected.

11. *Supposition.* We jurors had to suppose things that we doubted and things that we did not believe—to see where they led. For example, we supposed for the sake of argument that the victim had wanted to harm the defendant. From this we reasoned that she might then have been defending herself against attack. We also reasoned that he probably would have managed to do damage to her before they entered the house, if he had intended to harm her, thus probably refuting the supposition. But since this conclusion was only probable, it did not give us proof beyond a reasonable doubt.

12. *Integration.* In any real situation these dispositions and abilities overlap, as is shown by the cited examples. In addition the dispositions and abilities must in any real situation be integrated to produce and defend a decision. We jurors had to integrate them in reaching our decision about how to vote on the verdicts and in defending our tentative decisions to each other. Although our reasoning was presented orally, this ability to defend often requires writing, since much argument in modern life is in writing.

The actual presentation of a defense (that is, one's reasons) orally or in writing is only on the borderline of being constitutive of critical thinking, though having the defense available is constitutive of critical thinking. Since it is difficult in practice to make the distinction between having a defense and presenting it, and since the presentation is so crucial in life activities, the presentation is here included in the constitutive abilities for the sake of simplicity.

I have referred to suppositional and integration abilities as "metacognitive," because they call for a cognitive operation on another cognitive operation (a phenomenon Inhelder & Piaget, 1958, have suggested is a crucial feature of Piaget's "formal operations"). Although the term 'metacognitive' is ambiguous these days, I use it because it does seem to be the most appropriate label.

13. *Orderly Manner.* Especially when problems are complicated it helps one's thinking to proceed in an orderly manner. Various specifications of problem-solving steps, the monitoring of one's own thinking,

and critical thinking checklists are examples of general guides that can help in the orderly pursuit of a decision about what to believe or do. We jurors found it useful to take the parts of the murder and voluntary manslaughter charges one at a time, in order.

The acronym, FRISCO, I have found to be useful as a reminder of a checklist used to make sure that one has done the basic necessities in reaching a decision about what to believe or do:

F for focus: identify the focus or central concern

R for reason: identify and judge the acceptability of the reasons

I for inference: judge the quality of the inference, assuming the reasons to be acceptable

S for situation: pay close attention to the situation

C for clarity: check to be sure that the language is clear

O for overview: step back and look at it all as a whole

14. *Sensitivity to Others.* If we jurors had not been sensitive to each others' feelings and levels of knowledge, things would have been much more difficult. For example, when one juror made what the rest of us thought to be an apparently groundless suggestion about the moving of the body, we were kind and gentle. We did not want to make him feel stupid. Also he could have made things more difficult for the process of reasonable deliberation, if he were told point blank what we thought. Another: In offering my interpretation of the charge of murder to the jurors, I avoided the terms, 'necessary condition' and 'sufficient condition,' because these terms might be intimidating to those unfamiliar with them.

15. *Rhetorical Strategies.* Although effective rhetorical strategies can be used to manipulate people to accept what is not true, it is helpful for the critical thinker both to understand these strategies and to be able to employ them. It is useful to understand them to help one be alert for effective persuasive techniques masquerading as valid arguments. And it is useful to be able to employ them so that one's valid arguments are effectively conveyed to one's intended audience.

One effective rhetorical strategy is to concede in advance what you know to be easily provable by the opposition. If you fight vigorously for a position that is easily refuted, then your perceived credibility will diminish. The defense attorney in this case conceded that the defendant killed the victim. Another strategy is to bring up the opposition's points before the opposition gets a chance to do so, thus eliminating the shock and/or surprise value of the opposition's points, and showing the audience that you have taken the point into account in reaching your conclusion. The prosecutor attempted in advance to refute the expected defense contention that she did it in self-defense.

16. *"Fallacy" Labels.* A sizable set of fallacy labels have sprung up in the practice of appraisal of arguments and rhetorical strategies. Examples of such labels are 'circular,' 'bandwagon,' '*post hoc*,' '*non sequitur*,' 'hearsay,' and 'appeal to authority.

One reason for being familiar with these terms is that people who are not familiar with them are at risk of being intimidated by those who are. For example when William F. Buckley says in his inimitable fashion, "That's a *non sequitur*," it is easy to think (if one does not know the meaning of '*non sequitur*') that Buckley has some important technical knowledge about argumentation which is revealed in this accusation.

Another reason to be familiar with this terminology is that its use is sometimes a quick shorthand for a challenge that might otherwise take much more time. Its use facilitates communication, as in our courtroom where the term 'hearsay' was used as a label for what is often frowned upon, especially in courtrooms.

A third reason for being familiar with the terminology is that such familiarity can sensitize one to or remind one of recurrent problems. The term, '*post hoc*,' sensitizes people to the fact that showing that one thing came after another does not prove that the first caused the second. The fact that the defendant killed the victim just after he followed her into the house does not prove that his following her in caused her to kill him (though it did enable her to do it).

A difficulty with the use of the fallacy labels is that many people are not familiar with them. In trying to be sensitive to the level of knowledge of my fellow jurors, I avoided the term '*post hoc*' in our discussion of the post hoc fallacy that seemed to tempt one of the jurors. The term '*post hoc*' was probably not in the vocabularies of all of them.

A second difficulty with the terminology is that often things properly labeled by some of the fallacy labels are not fallacious at all. For example, many cases of appeal to authority constitute good thinking. Often appealing to an authority is the appropriate thing to do, as when the defense and prosecution appealed to the authority of the pathologist.

The field of critical thinking is sometimes organized in accord with a list of fallacies. I have not used this approach because some basic principles and criteria tend to be neglected by it, and because in practice there is so much danger of students' acquiring a superficial knowledge, and labeling things fallacies that are not fallacies.

Summary and Comment

On the assumption that "critical thinking," as the term is generally used, means reasonable reflective thinking that is focused on deciding what to believe or do, I have offered a conceptualization of critical thinking that consists of twelve dispositions and sixteen abilities. To clarify the con-

ception these dispositions and abilities were exemplified, drawing largely on my experience as a juror in a murder trial. There is more to be said about each of the dispositions and abilities, but these examples and the discussion should convey the flavor of the conception.

The jury example has idiosyncrasies. It is not representative in all respects of all critical thinking situations. But that is true of any example. This one does show a socially significant activity that requires a combination of most of the listed dispositions and abilities included in this conception of critical thinking—in a context that is not standard school subject matter for most students.

The listed dispositions include such things as being open minded and trying to be well informed. The abilities involved fall into five groups: *clarification* abilities, those concerned with getting information and other starting points on which to *base* one's decision about belief and action, those concerned with *inferences* from these starting points, certain *metacognitive* abilities, and *auxiliary* abilities.

Significant features of this conception of critical thinking are its focus on belief and action, its being in terms of things that people actually do or should do in their daily lives, its emphasizing criteria (many of which are not presented in this essay) to help us evaluate results, its including both dispositions and abilities, its providing a basis for organizing and assessing a thinking-across-the curriculum program as well as a separate critical thinking course, its providing an ingredient necessary for problem solving approaches to teaching, and its comprehensiveness.

It does not tell us how and when to teach what. Much exploratory work and controlled research needs to be done in that direction. This essay is only a step in the development of a total curriculum and procedures of assessment of the critical thinker. But clarity of justified goals is required before we can confidently make decisions about curriculum, instruction, and assessment.

Note

This conception of critical thinking and its presentation here have profited from the comments of students, friends, critics, and practicing teachers of critical thinking, including Richard Berg, Michelle Commeyras, Todd Dinkelman, Sean Ennis, Suzanne Faikus, Ruth Manor, and Robert Swartz. I am very grateful to all of them.

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Robert Ennis, Philosophy of Education, University of Illinois, 1310 South 6th Street, Champaign, Illinois 61820, USA