

Six Steps of Critical Thinking

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Dear Colleagues:

These “Six Steps” of argument analysis and evaluation are developed from Michael Scriven’s five steps (in *Reasoning* [McGraw-Hill, 1976]), by making his step for evaluation of evidence and inferences into two steps. Teaching with this document as a summary inevitably led to revisions over the years, most recently after its use this Spring. I also owe a debt to Larry Wright’s *Practical Reasoning* (HBJ, 1989) for his concept of ‘rival’ arguments, as compared to ‘counter’ arguments.

The chief motive for developing this approach has been economy of time. I wanted to make it possible to teach a coherent approach to argument analysis and synthesis which fits into one semester (fifteen weeks). I do not include work on fallacies because of two redundancies which that would entail—[1] that required texts in English composition already include sections on fallacies, and [2] that no actually fallacious argument could survive this analysis anyway (what I take to be Scriven’s view on this issue).

This approach to critical thinking can be taught in several ways—by pulling it all together with one shared argument which the entire class will analyze and evaluate at the latter part of the semester, or by having each person choose her or his own argument, or (if time and pacing allow) one of each. It could also be done by having each person construct a pre-assigned issue by using these steps, or by each choosing an issue and constructing from there.

I start all semesters with a “Day 1” pre-test, using a short paragraph and asking a few questions about it; the same document can be used as part of the final exam in order to provide empirical evidence of learning.

This approach to teaching critical thinking relies heavily on homework which is discussed in the next class, and also benefits from a revised version of the Frank Williams/Ron Messerich “Learning Logic” diskettes which my students use at times convenient to them but in a sequence conformable to our progress through the semester. Lecture and textbook treatments are minimized, necessarily in order to make time and space for homework. The final project, an argument analysis, as mentioned above, can be developed by keeping a file of those newspaper columns, editorials, and other suitable-length opinion pieces which experience shows can work fruitfully and from which students might select one suitable to their own interests.

Finally, I owe great thanks to those colleagues who have helped me develop my thinking over these past twenty years with this scheme: Michael Scriven, Ralph Johnson, Matthew Lipman, Mark Weinstein, Don Levi, Mark Battersby, my undergrad and grad students and, indirectly, Stephen Thomas. Frank Chessa and Claude Gratton have helped me through recent discussions.

SIX STEPS OF CRITICAL THINKING

I. Clarification and Paraphrase.

This skill has 2 parts:

<a> Look up definitions of any unfamiliar words. If a rhetorical question appears, re-write it in statement form (e.g., “How could you be any more beautiful?” becomes, “You could not be any more beautiful.”). If a word seems extreme or distorting, flag it by noting what would be a calmer choice of wording that could do the same job. If a word or phrase is used in a special way, as with a technical term, jargon, or a use familiar only to those who share a certain practice (like a boating term, or a partisan political term, or any other “in-house” term), then tell us what that term means to those of us not familiar with it. You may edit a piece of writing in these ways, for clarification, but do not change the original meaning or intent.

 Write a short, three-sentence paraphrase which summarizes the author’s the chief reasons and the conclusion in your own words.

II. Bracket and Number Sentences to be Used.

Now that you know, broadly, what the piece is all about, choose the parts that are vital to its construction and cannot be left out. Leave out, or *give the same number!!* to sentences which mean substantially the same thing as one you already selected and numbered. Omit as much as you can, simplifying and condensing. Look for reason- and conclusion-indicator words, insert them if you wish, but bracket and number each claim or part of a sentence—or even a whole paragraph can have one number—that you need. A short example would be: “(1) <.....>, so, (2) <.....>”.

III. Diagram the Structure of the Argument.

Use one or more of the four types of diagram (serial, linked, convergent or divergent), in whatever combinations, in order to show the levels of argument, the sub-arguments as they stand and as they join and flow together, and the intermediate and final conclusions (final at the bottom). If puzzled, start by putting the conclusion at the bottom. If there is no clear flow to be diagrammed, try at least two structurings, and compare them. It might even be helpful to complete two

alternative diagrams if the writer has been unclear as to how the thinking is structured. Also, if you settle on one diagram as best, you will then be in a position to explain why you organized that way instead of some other possible, but less plausible way. In diagramming, remember the Principle of Charity: you are to give the writer the benefit of the doubt, and take the argument to mean a relatively more-defensible, rather than a relatively less-defensible version, whenever the wording itself seems equally to allow either of those two.

Also, when doing the diagramming, be on the lookout for **missing assumptions or missing conclusions** (practiced in class). When you find that a missing statement is needed to make sense of the whole, but had been omitted by the writer, tell us what it is, and put it into the argument where it belongs, **set off by use of a square bracket [—]**. Give it the letter A (if a missing assumption or statement), or the letter C (if a missing conclusion), together with the number of the sentence or sentences with which it belongs. For example, suppose that your sentence <13> had said that “65% of the people polled plan to vote for Yacobofski”. Then the missing assumption might be, e.g., “[A₁₃, This sample is representative of the electorate as a whole.]”. Or, if the conclusion had not been stated, the missing conclusion would be given by you as, “[C₁₃, Therefore Yacobofski will win the election]”).

IV. Evaluation of Truth-values.

This section should be paired with Section II, Bracketing and Numbering. In Section II you would have listed each bracketed, numbered sentence/paragraph, and also any missing assumptions (e.g., A₇ would be a missing assumption which belongs with sentence <7>, or C₂₃ would be an unstated, missing conclusion which belongs as a conclusion for <23>).

When the list is made for each statement needing evaluation, begin Step IV by considering other or counter evidence. In view of what the statement says, or claims, what else do you know about it? If you have other information, either similar and friendly to the meaning of the statement, or hostile and rebutting it, write your comments to tell the reader this other information. After you have done this, then consider what this information means: if it weakens the claim of the original, lower the original from 100% true to something more in balance with the other information; if it lends strength and reinforces, you might give the original a high credit, or you might think that the original barely touched the evidence it needed for its own strength (in which case it loses points). **Complete your paragraph with a number**—for example, “So, 50% true”.

One pointer: normally you would not give just a short comment for every statement. A few might be short, such as when something is known by you to be noncontroversially true, or a matter of public record. But more often, it takes a few sentences to compile the other information needed to show the context and evaluate the merits of the original. And on at least a few of the statements—the key

statements which assert the strongest claims or make the most hard-hitting or general judgments—you need to write more. Explain the claim made in the statement, and bring in what you know about what the world would have to be like if that statement were totally true. Bring in other evidence, counter-evidence, the context of this issue. Comment on exaggerations or double-meanings or emotionally loaded terms, rhetorical questions, anything that requires attention to evaluate the sweep and implications of the statement. Tell us what we need to know about

V. Plausibility Ranking and Degrees of Support.

First, list each inference, from upper left on your diagram (inference “a”) to the final conclusion. It might look like this :

a. (1) + (2) → (3)

b. (4) + (5) → (6)

c. (3) + (6) → (7)

How evaluate each of these for their plausibility? The best way is to take three steps:

First, write a brief summary of the argument, in narrative form, such as:

“Because of _____ and _____, therefore _____” .

Second, write a counter-argument, a rival to this one. A counter-argument or rival is either

(1) a different conclusion stemming from the same reasons; or

(2) one or more different reasons which still lead to the same conclusion,

or,

(3) different reasons **and** different conclusions which, taken together, make either a more-plausible or (if it’s all you can invent, then) a less-plausible account of the same topic as the original.

Third, compare the original to the counter, and assign a degree of support to the original accordingly. The degrees of support range from “nil”, meaning none at all, irrelevant or useless, all the way through “weak”, “moderate” and “strong” to “DV” (deductively valid), which means that the conclusion is compelled by the evidence, that no other conclusion can be supported, and this one cannot be rejected so long as the reasons are taken to be true. Use this five-point scale to examine each arrow (inference) in the original and the rival(s). Then, by comparing, decide which of the five degrees of support is the best judgment call. If the best counter you can find is very shaky, then the original deserves a “strong” degree of support; if the counter is of approximately equal plausibility, then the original deserves a “moderate”; and so forth. The reason for producing these rival arguments is to be able to compare at least two contrasting arguments dealing with the same issue. Since you already diagrammed the original, here you can keep that diagram in mind to show us a parallel but different argument which has its own

structure (though you need not do the diagram of it) but uses either a little or a lot of other evidence, and/or other conclusions. You already developed some, or a lot, of this other evidence when you did Step IV. Use it again here, or add other relevant information or other plausible, well-known, or even bizarre counter-arguments in order to create a contrast between the original and some alternative approach to it. (I say “even bizarre” because, rarely, an original is so well-made that the only counter we can think of is “off the wall”; but just having to do that, and knowing we did it, shows, indirectly, that the original must have been very strong).

When you have listed all the inferences (“ $\text{---} \rightarrow 6$ ”) in the original diagram, at each point provide at least one rival argument, using the three steps given above (write a short narrative to summarize it, develop a counter, and compare the two so as to give you a judgment call about the degree of support you assign to the original). By comparison to the rival argument presented, the original argument’s arrow or degree of support is nil, weak, moderate, strong or DV. Thus you will finish Step V with one list of inferences, similar to the example above, with appropriate assignments of qualitative judgments as to their degrees of support stated at the end of each discussion, as the outcome of the three steps you took to reach that judgment. This activity will play a vital role in your final soundness judgments.

VI. Soundness: Overall Judgment.

Soundness is the overall merit of the argument when we combine its truth-values with its degrees of support. An argument with all true premises and all “DV” degrees of support would be entirely sound. One with all false statements and all arrows evaluated as ‘nil’ support would be entirely unsound. (In class we shall work with a modified version of Stephen Thomas’s pg. 43 of *Argument Evaluation* to explain the various gradations of soundness judgments which lie between entirely sound and entirely unsound). **Soundness** is the **combination** of truth-values **with** degrees of support: it is a relative concept, as was Step IV with truth values from 0–100 and Step V with its “plausibility rankings” from nil to DV.

Step VI will evaluate soundness in two sections:

VI [a] Address the internal soundness of the original argument. By ‘internal’, I mean the original argument as presented by its author. To do Part [a] of Step VI, consult the soundness chart distributed in class. Give some mark to each sub-argument (for example, “I”, “II”, etc.), and discuss the soundness of each of these, cumulatively (how they combine what truth they have with whatever degree of support these truths give to the conclusion).

To do this, start by listing sub-arguments as portrayed in the diagram in Step III, one at a time—perhaps call them I, II, III, etc.—starting with the smallest sub-argument and working your way to each of the others and then their accumulations (as, for example, here I is a subargument, and II is a subargument, and I + II go to III, making a larger argument, and so forth).

Next, VI[b], give a soundness call to each of these, the subs and the complexes made up of them, increasingly to the whole overall argument (made up of all the parts). This final soundness call, then, will summarize and bring together the accumulation of all prior soundness calls for the subarguments as they played their roles along the way.

Sometimes the preceding five steps will have revealed that one rival clearly stands out from the other(s), in which case your consideration of the soundness of that (sub-)argument will simply mean reviewing how and where this rival brought more truthful and relevant information to bear on a more plausible conclusion, and, reciprocally, that that conclusion did a better job of explaining or summarizing the original information than did any other rival. If it had superior truth qualities in its statements, and superior degrees of support in its inferences, then it is the most sound argument available on this topic, and deserves to be seen as such (and *vice-versa*, etc.).

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