Flow Charts for Critical Thinking

Daniel E. Flage
James Madison University
Department of Philosophy and Religion
Harrisonburg, Virginia 22807
Tel: 540-568-6394
E-mail: flagede@jmu.edu

Those of us who approach critical thinking as a thinly veiled course in informal logic are concerned with issues such as the strength of arguments (understood in terms of truth-preserving or truth-indicating relations), the adequacy of explanations, and the truth or probable truth (correspondence to the world) of statements. If our goal is to empower students with a set of skills that will allow them to evaluate any piece of discourse, I believe this goal can be achieved if students ask a series of questions. What follows is a set of flowcharts that will walk a student through this evaluation process. I believe this might be a useful tool in our several approaches (e.g., informal logic, rhetoric) to teaching critical thinking.

I consider the arrangement of the charts fairly natural. Insofar as we are fundamentally concerned with the evaluation of arguments, it is reasonable to begin with questions regarding arguments. The early questions are very general, followed by more specific questions regarding deductive and inductive arguments, followed by questions regarding the truth or falsehood of the premises. Answers to some questions direct students to other charts. Of course, in some circumstances, students might want to use some of the later charts independently. For example, if one’s concern is whether to accept Professor Smith’s testimony regarding events in the American Revolution, one might want to go directly to the questions concerning testimony in Chart #5.

A flowchart approach to critical thinking is, by its nature, quite rigid: it is a highly structured decision-procedure. Each question is answered affirmatively or negatively. Answers lead either to evaluative conclusions or to additional questions. In principle this should result in uniform evaluations of arguments. In practice, of course, not all students will give the same answers to each of the questions. And some questions-questions regarding what constitutes a “significant number” of shortcomings in an inductive argument, for example—are questions for which there often is no obviously correct answer. So, students should be prepared to defend their answers to the questions. While the evaluative structure is rigid, in practice there is ample room for reasoned disagreement.

The flowcharts provide a structured summary of issues discussed in a critical thinking course. While I should like to say that the flowcharts account for at least some of the improvement my students exemplify by the end of the course, I have

been unable to find a testing procedure to determine that the charts themselves account for the improvement. I hope you will find the flowcharts useful.

Chart #1

Preliminary Questions

Assuming there is an argument:

1. What are the premises and conclusion?

2. Are there any ambiguities in the argument?
   - Yes → See Ambiguities, Chart #2
   - No

3. Are the premises relevant to the conclusion?
   - No, or don't know → See Relevance, Chart #3
   - Yes

4. Do the premises presume more than they should?
   - Yes, or don't know → See Presumption, Chart #4
   - No

5. Are any premises left unstated?
   - Yes
   - No

6. What is (are) the premise(s)?

7. Is the argument deductive?
   - Yes
   - No

8. Is it valid?
   - Yes
   - No → What fallacy does it commit?
     - Yes → Sound argument
     - No → Unsound argument
     - Don't know

9. Are the premises true?
   - Yes
   - No

10. What evidence (argument) is there for the truth of the premises?
The argument is inductive.

11 Does a premise make an appeal to authority?
   Yes. → 12 Is the authority legitimate?
   Yes. → Don't know. → See Chart #5
   No. → The support is weakened.
   No. → The support is weakened.

13 Does a premise appeal to ignorance?
   Yes. → 14 Is this informed, e.g., an appeal to science?
   Yes. → Don't know. → See Chart #5
   No. → The support is weakened.
   No. → The support is weakened.

15 Does the argument lead to a generalization?
   Yes. → 16 Is the generalization based on a small number of cases or a typical cases?
   Yes. → The support is weakened.
   No. → The support is weakened.
   No. → The support is weakened.

17 Does the argument rest on a cause or a chain of causes?
   Yes. → 18 Is each alleged cause a genuine cause?
   Yes. → Don't know. → See Chart #5
   No. → The support is weakened.
   No. → The support is weakened.

19 Is it an analogical argument?
   No. → The support is weakened.
   Yes. → The support is weakened.

20 Are there a "significant number" of respects in which the things are compared?
   No. → The support is weakened.
   Yes. → The support is weakened.

21 Are the respects in which things are compared similar?
   No. → The support is weakened.
22 Are these respects relevant? 
Yes. 

23 Are a "significant number" of relevant things compared? 
Yes. 

24 Are there differences that weaken the analogy? 
Yes. 

25 Are there differences that strengthen the analogy? 
Yes. 

26 Is the conclusion strong relative to the premises? 
Yes. 

27 Are the premises true? 
Yes. 

28 What evidence (argument) is there for the truth of the premises? 

29 Are there a "significant number" of elements that tend to weaken the support? 
Yes. 

The support is WEAK: explain why. 

No. 

The support is STRONG. 

\(^1\) In some cases, by answering the previous questions you have examined the evidence for the truth of the premises.
Chart #2
Ambiguities in Arguments

Are all the central words in the argument assigned the same meaning throughout? Yes No

Does the validity of the argument or the truth of the premises rest on the shift in meaning? Yes

No Return to Chart 1, Question 3. The argument commits the fallacy of equivocation and should be rejected.

Is the structure of the sentence sufficiently "loose" that more than one distinct proposition could be meant and the sentence is used as a premise or conclusion? Yes No

The argument commits the fallacy of amphiboly and should be rejected.

Is a word in a common claim accented in an unusual way? Yes No

The argument commits the fallacy of accent and should be rejected.

Does the argument rest on accepting the truth of a claim taken out of context, particularly when the context suggests a different understanding of the claim? Yes No

The argument commits the fallacy of accent and should be rejected.

Is one of the premises true? Yes No

Is the claim true? Yes No

The argument commits the fallacy of composition and should be rejected.
Is one premise a claim true of a whole or an entire class of objects and the conclusion a claim that ascribes the same property to one of the parts or a member of a class?

No.

Is the claim true?

Yes.

Is the claim true?

No.

The argument commits the fallacy of division and should be rejected.

No.

Either there is no ambiguity in the argument, or the persuasive force of the argument does not rest on that ambiguity. Return to Chart 1, Question 3.
Chart #3
Relevance

Does the premise appeal to some undesirable consequence if the conclusion is not accepted as true?

Yes. → The argument commits the fallacy of appeal to force and should be rejected.
No. →

Does the premise consist of an attack on an individual rather than a criticism of his or her position?

Yes. → The argument commits the fallacy of personal attack and should be rejected.
No. →

Is a premise that the proponent's actions are inconsistent with his or her words?

Yes. → The argument is a personal attack (tu quoque) and should be rejected.
No. →

Does a premise appeal to the inconsistency in someone's position?

Yes. → Does the person still hold the position?
No. → The premise is irrelevant. Reject the argument.
Yes. → The premise is relevant. Return to Chart 1, Question 4.

Does a premise appeal to a desire to be loved or special?

Yes. → The argument involves mob appeal and should be rejected.
No. →

Does a premise appeal to dire circumstances to get a conclusion accepted?

Yes. → This is an appeal to pity and should be rejected.
No. →

Does a premise appeal to a general rule in circumstances in which the rule does not apply?

Yes. → The argument commits the fallacy of accident and should be rejected.
Does a premise distort someone's position?  
No.  
Yes.  
This is a straw person fallacy. The premise is irrelevant, and the argument should be rejected.

Does a premise shift away from the issue under consideration?  
No.  
Yes.  
This is a red herring. The premise is irrelevant, and the argument should be rejected.

Do the premises appear to support one conclusion but another is drawn?  
No.  
Yes.  
This is an irrelevant conclusion and the argument should be rejected.

Is there some other way in which the truth of the premises does not increase by the slightest amount the probability that the conclusion is true?  
No.  
The premises appear to be relevant to the conclusion.

Return to Chart 1, Question 4.
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Chart #4
Presumption

Does one of the premises restate the conclusion? Yes. The argument begs the question and should be rejected.

No.

Is there a series of arguments in which the conclusion of the last is a premise of the first? Yes. The argument begs the question and should be rejected.

No.

Is the argument based on a question that assumes a previous question has been answered? Yes. Is the presumed answer reasonable?

No. Complex question: Reject the argument.

Yes. Return to Chart 1, Question 5.

Suppressed evidence: reevaluate the argument in light of the suppressed evidence. Return to Chart 1, Question 5.

Has evidence which is contrary to the conclusion been ignored? Yes. False dichotomy; reject the argument.

No.

Does a disjunctive premise leave out possibilities? Yes. Explain why the argument should be rejected.

No.

Are there other unwarranted presuppositions? Yes. Explain why the argument should be rejected.

No.

There appear to be no unwarranted assumptions.

Return to Chart 1, Question 5.
Testimony comes in many forms. There are observation claims—and the processes of observation—which require evaluation. There are authoritative testimonies. There are surveys. In each case, to evaluate the claims made you, in effect, engage in inductive reasoning. The questions on these charts provide a guide for evaluating claims of each sort. Like all cases of inductive reasoning, however, answering these questions will not provide conclusive reasons for your evaluation.

**Chart #5**

**Observation, Testimony, and Surveys**

Was the observer physically in a position to make the observation? No. Is there a way to explain how the observation could have been made, e.g., surveillance cameras? Yes. No. There is insufficient evidence to accept the observation claim.

Were the observation conditions adequate? Yes. No. Support for the claim is weakened.

Was some technological device needed to make the observation? Yes. Did the observer use that technological device? No. Support for the observation claim is weakened.

Was the observer know how to use that device? Yes. No. Support for the observation claim is weakened.

Does the observer have the background knowledge needed? No. Support for the observation claim is weakened.
to interpret what was observed?

Yes.

Is the observer's claim consistent with what you know from other sources?

Yes.

Is the observer free of bias?

No. Yes.

Does the bias make a difference?

Yes.

Support for the observation claim is weakened.

Is there a "significant number" of weakening factors?

Yes. No.

Reject the claim. Return to Chart 1, Question 13.

Accept the claim. Return to Chart 1, Question 13.
Testimonial Evidence

Is the person offering the testimony generally reliable?
Yes. → Support for the claim is weakened.
No. → Is the person offering the testimony an expert in the relevant field?
Yes. → Will the person gain by being believed?
Yes. → Will the person lose if he or she is wrong?
Yes. → Is the claim consistent with other things you know?
Yes. → Is the person biased?
No. → Has the support for the claim been significantly weakened?
Yes. → Reject the claim. Return to Chart 1, Question 13.
No. → Accept the claim. Return to Chart 1, Question 13.

Support for the claim is weakened.
Support for the claim is weakened.
Support for the claim is weakened.
Support for the claim is weakened.
Surveys

Does each member of the population being surveyed have an equal chance to be selected for the sample?

Yes. → Yes.

Are only members of the target population being surveyed?

Yes. → Yes.

Are the questions framed in a neutral way?

Yes. → Yes.

Are the questioners unbiased?

Yes. → Yes.

Is the sample size large enough?

Yes. → Yes.

Has the evidence for the conclusion been significantly weakened?

Yes. → Reject the conclusion.

No. → No.

Accept the conclusion.

Return to Chart 1, Question 17.²

²I wish to thank Claude Gratton for his very helpful comments on an earlier version of this paper.