

HPS/PI 120 Second Paper Assignment

Instructions: Write a paper of approximately 2,700 words (9 double-spaced typed pages). The general guidelines are as follows. First, your paper must critically engage one or more of the topics we have discussed in the class. Your topic should not be too close to the topic of your first paper without special permission from me. Second, your paper should not *merely* summarize the position(s) of some of the authors you discuss; it should in some way locate them relative to each other, synthesize those ideas, criticize them, defend them against important objections, or develop them in your own way. Third, the topic of your paper should be of an appropriate scope given the length constraints. Some students will have strong backgrounds in some area of science that they may wish to bring to bear in their papers. This is fully encouraged, so long as: (i) all of the technical ideas are explained as clearly as possible within the constraints of the length limits of the paper; and (ii) your paper grapples directly with the philosophical issues raised in this course, and is not merely an exposition of the relevant science.

Due Date: You must submit your paper to me by email before 5:00 pm on Friday, December 9th.

Grading: This paper is worth 35% of your final grade, and will receive a numerical grade out of 35.

Collaboration: Collaboration on this assignment is encouraged. Students are free to discuss the topics with one another, read each other's papers, and offer suggestions. Any suggestions or ideas contributed by another student must be acknowledged just as you would acknowledge an idea taken from any other source. The only restriction is that each student must write their own paper containing their own ideas and words.

References: All sources used in the writing of your paper must be properly referenced. This applies to material in the course readings, other published material, lecture notes from this class and other classes, material 'published' on the internet, and ideas contributed verbally by other students. Information about proper procedures and formats for references is included in my handout "How not to get BOC'ed," which is posted on the course website. Further information is also available at <http://www.its.caltech.edu/~words/plagiarism/index.html>. Failure to follow these guidelines may result in a lowered grade or even an automatic F in the course; it may also lead to charges being brought before the Board of Control. If you have any questions about these issues, please do not hesitate to contact me.

Advice on Writing a Philosophy Paper: The course website contains several handouts on writing a philosophy paper, as well as links to websites on the topic.

Reading Drafts: I am happy to read drafts of papers, on a time-permitting, first-come, first-served basis. If you get a draft to me early, it is likely that I can get it back to you within 24 hours. Please indicate whether you would like to receive detailed comments, or only a general sense of whether you are on the right track. Please request the former only if you actually plan to make substantial revisions to your paper based on the feedback.

Topics: The topics offered below are given as suggestions: you may address one of them as is, you may modify one of these topics, or you may create your own topic. Whatever topic you may choose, your essay should have a title that clearly and accurately reflects what the essay is about. If you would like further readings that may be helpful in addressing some of these topics; I recommend starting with the Stanford Encyclopedia of

Philosophy. Asking me for advice for what to look at is also a very good idea.

1. Consider some particular episode in the history of science in which it seems correct to claim that scientists changed something about the paradigm that they were operating within. Does this episode fit Kuhn's description of a scientific revolution?

2. Obviously, what we take to be good scientific evidence for a claim or what counts as a good scientific explanation is going to partly depend on what paradigm/research tradition we are working in because we believe different theories about the world. But are there additional ways in which paradigms or research traditions dictate what counts as evidence or is there a logic of science that transcends paradigms?

3. Both Lakatos and Laudan assume that there can be competing research programs or traditions within the same subdiscipline of a field. Could such a research program be empirically tested? How?

4. It seems clear that factors "external" to the science itself such as the need to secure funding, the human desire for fame, cultures biases in questions asked and answered accepted and others can affect the practice of science in numerous ways. How should these facts affect our judgment of the reliability of scientific claims?

5. Do the scientific ideals of objectivity and neutrality (in political and social values and other things) actually lead to problems for women (and other groups) as Sayers claims? Or could they be seen as part of the key to improving the lives of all people? It is even possible for science to be neutral in this way? [I recommend reading the Longino piece on values if you write on a question very close to this]

6. If we take seriously the community structure of science, how should this change our understanding of scientific knowledge, of justification and evidence, or of objectivity?

7. Should we be confident that electrons exist? What about other entities like quarks or neutrinos, which we do not "manipulate" in the same way?

8. Should we be confident in the truth of our scientific theories or claims such as the General Theory of Relativity or Quantum Field Theory or claims that there was a big bang roughly 13.7 million years ago, or that mammals first appeared around 200 million years ago?

9. Duhem argued that at least in most cases (perhaps not for 'total' physical theories) there is an underdetermination of theory by evidence. Often alternative sets of hypotheses and assumptions can be constructed which fit the relevant data apparently equally well. Historically, it is clear that we often simply did not conceive of the true explanation for some phenomenon and so incorrectly judged that we had a very good explanation for something because it was the best explanation available. Do these facts related to underdetermination show that there is a deep problem with certain kinds of scientific realism?