

# Philosophy of Science (720A04), VT2019, Exam

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# 1 Assignments

Please answer the following questions in essay format. Answers are graded on the basis of completeness and depth, not length, but as a rule of thumb 1 - 1,5 (+/- 20%) pages per question should be about right. I award up to 8 points per answer. 50% for Pass, 75% for Pass with distinction. Deadline is 24 May at 17:00. Hand-in via Lisam.

## 1.1 Hypothetico-Deductive Method

**Question:** What is the hypothetico-deductive method, and what are its strengths and weaknesses with respect to its ability to verify and/or falsify hypotheses? Do you think science revolves around the use of the H-D method?

**Answer:** The problem with applying inductivism is well described in Understanding Philosophy of Science from James Ladyman [1, p. 40]: “Since it is logically possible that any regularity will fail to hold in the future, the only basis we have for inductive inference is the belief that the future will resemble the past.”

So it seems that it is not possible to use the true principles of induction, but science needs a way to circumvent this problem, otherwise it would be impossible to build any chain of validity. The resources for checking out all possibilities and outcomes are either too demanding or not possible at all. That’s when the Hypothetico-Deductive methods comes in, as it suggests a way of handling this problem. It does not solve the problem, but rather shows a way how to deal with a theory or hypothesis.

We will use the following example throughout this answer to have a vivid hypothesis. The hypothesis is, that all swans are black.

Depending on where one looks up information about the Hypothetico-Deductive method, the methods consist of three or four steps:

- Hypothesis
- Prediction
- Test of Predictions

The literature relying on four steps include, that for finding a hypothesis, previous knowledge and experience must be used and therefore results in another step. So from the observations a hypothesis is being phrased. In our example the hypothesis is, that all swans are black. In this three-step explanation we assume that there is at least a strong hint towards the hypothesis, but the method itself holds also for random hypothesis if the steps are correctly and thoroughly applied.

The hypothesis needs one crucial property which is that it is falsifiable. It’s important that this property is falsifiable by science in general (maybe in the future) as we otherwise leave no room for our hypothesis being invalid

short summary, where it comes from, compare with induction explain every step of the method take the example with Newton Evaluate, thus describe what is good and bad about it, maybe cite Answer the questions, strengths, weaknesses, ability to verify and finally if science evolves around this method.

## 1.2 Scientific Paradigms

**Question:** What is a scientific paradigm and how do they influence scientific practice? Is it good or bad that science is guided by paradigms? Do you think the programme you have chosen is schooling you into a particular programme?

**Answer:** TBA.

## 1.3 Falsifiability

**Question:** What does it mean for a scientific hypothesis to be falsifiable, and: (i) why is it good that they are falsifiable, and (ii) why is even better that they can be falsified in many different ways?

**Answer:** TBA.

## 1.4 Theory-Dependency of Observation

**Question:** In what way are observations theory-dependent, and why does that challenge the idea that hypotheses are generated inductively from observations?

**Answer:** TBA.

## 1.5 Difference between Natural and Human Sciences

**Question:** What is the difference between the natural and the human sciences according to Ingthorsson? Include a reflection on what Ingthorsson says about the nature of the phenomena that the natural and human sciences study, and relate to what that nature implies about differences in method.

**Answer:** TBA.

## 1.6 Difference Between Science and Pseudo-Science

**Question:** What is the difference between science and pseudo-science according to Sven-Ove Hansson, and why should we care?

**Answer:** TBA.

## 1.7 Being a Scientific Realist

**Question:** What does it involve to be a scientific realist, and what reasons can we have for adopting that position? Do you think those reasons are convincing, and do think it would make any difference for you to take a realist or anti-realist approach to research in your discipline?

**Answer:** TBA.

## 2 Sources

### References

- [1] J. Ladyman, *Understanding Philosophy of Science*. Routledge, 2001.