

Jerzy Neyman (1894-1981) is recognized as one of the co-founders of a so-called classical, or frequentist statistical paradigm. His views became a subject of fervent discussion among two adversary parties of philosophers of probability and statistics: frequentists and Bayesians. The core disagreement, concerning inference template, between these two fractions is that Bayesians' inference outcome is a degree to which an evidence confirms a hypothesis which is expressed by the probability of a hypothesis given the evidence, whereas frequentists conform to the probability of an evidence were hypothesis true – if this probability is enough low or high, they falsify or not falsify hypothesis respectively, with a given chance of committing an error. With regard to interpretation of probability function those attitudes differ in the following way. Standardly, for Bayesians this function reflects subjective degrees of belief, and for frequentists it is a long run, objective frequencies of an event.

Classical concept of statistical inference, despite its maintaining popularity in application, has faced powerful critique stemming from Bayesian position. This brings about the impression that from the theoretical point of view Bayesianism is a dominant alternative. Nevertheless, there is a recent tendency to reconcile these two paradigms which is present among statisticians as well as philosophers.

The main objective of my research project is to develop philosophical justification of Neyman's concept of statistical inference by showing that its general template is, to the substantial extent, equivalent or close to Bayesian inference, and by analyzing the way in which scientists use and interpret it.

Outcome of my project will be a comprehensive, metodologico-philosophical contribution to establishing common grounds between Bayesianism and frequentism. It aims to show, that in Neyman's theorem there are the instruments to do the same things that Bayesians say one cannot do with classical statistics. Many philosophers who wish to have access to a lucid and neutral overview of what Neyman was up to, will presumably make use of this project as a philosophically oriented and neutral historical reconstruction of his most crucial ideas (not biased toward frequentism or Bayesianism). Project's outcome will provide a base for discerning what in frequentist's account is due to Neyman, what is not, and what is clearly contrary to what Neyman claimed. By appealing to commonalities between Neyman and Bayesians I expect not only frequentists, but also Bayesians to find the outcomes to be useful in their defense against accusations stemming from frequentist paradigm, which is still grounded in researchers' practice much deeper than Bayesianism. Project's account will be also important for science in general because it will provide some new answers for questions such as why, despite the strong theoretical critique of frequentists hypothesis testing, Neyman's method remains pragmatically effective, and often generates answers numerically similar to Bayesian method, or to what extent is Neyman's philosophical concept still heuristically valuable for the future development of scientific enterprise. Also scientists are potential recipients of outcome of this research: it will offer them deeper explication of the methods they use and show that philosophical reflection over science is indispensable. Philosophical accounts of scientific methodology are important also for economic and societal reasons, because if they can influence scientific research, then they can influence any other aspects of human life provided that science is nowadays one of the greatest steering wheels of development of civilization.