

“The Logic of Theory Testing” **SIR KARL POPPER**

I - Two senses of "good theory":

- ***The demarcation problem:*** good theory in the sense of being scientific (ex Newton's physics.) Vs. bad theory in the sense of being not scientific at all (ex Aristotle's physics)
- ***Confirmation theory:*** good theory in the sense of being accepted as true (ex Wave theory of light) vs. bad theory in the sense of being rejected as false (ex. ether theory of light)

II - Logical Positivism: The verification principle

<p><i>Induction:</i> Swan a is white. Swan b is white. Swan c is white. ⋮ Etc. ⋮ (Prob) All swans are white.</p>

<p><i>Deduction:</i> All Swans are white a is a Swan. Therefore a is white.</p>
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Induction: based on a number of finite observations, a probable universal statement is inferred.

A theory is a collection of propositions with a number of consequences

- ***Verificationist theory of demarcation:***
If a given theory entails verifiable consequences, then it is a scientific theory.
- ***Inductive theory of confirmation:***
If a theory entails true consequences, then it is a true theory. The verified consequences of the theory support by in an inductive way the truth of the theory.

III - Problems with induction:

- Singular empirical statements (ex a is a white swan)) cannot possibly confirm universal statements (ex all swans are white).
- Hume's objection: Suppose you attempt to justify induction in the following way: The success of induction in the past justifies the principle of induction. But this

doesn't work the justification is circular. You are assuming the truth of induction in the past to justify the principle of induction. You are assuming the truth of the very thing you are trying to prove.

IV - Popper's alternative: rejection of both verification and induction:

- ***Popper's answer to the demarcation problem:***
A given theory is scientific if it has falsifiable consequences.
- ***Popper's rejection of confirmation: Popper's deductive proposal***
A given scientific theory is a good theory if it survives severe falsifying tests.
- ***Popper's bombshell:*** the purpose of the scientific method is not to reach true theories but to examine the extent to which a given theory can avoid falsification.
- ***Why Popper rejected induction and verification?***
 - a) - Asymmetry of falsification and verification.
 - b) - The problems with induction.
- ***Scientific theories should be bold:***
 - a) - Highly improbable relative to background knowledge.
 - b) - A theory should suggest possible falsifying tests.
- ***Implications on Freudian and Marxist Theories***

V Rejection of Historicism:

Historicism is the view that there are universal laws of evolution that govern history.

Popper's reply: there are no such laws. There are only historical trends, but no Universal laws

VI - Criticisms of Popper's falsificationism:

- Can Popper really avoid induction?
- Can theories be ever falsified? theories are tested in conjunction with a number of auxiliary sentences:
If T & A1, A2----An, then consequence P
Not P
It doesn't follow that not T for any auxiliary statement could be false.
Is the distinction between ad hoc statements and auxiliary statements helpful?

VI – Conclusion: The legacy of Popper