

## Science: Conjectures and Refutations – Karl Popper

- Popper wants to distinguish the difference between science and pseudo-science.
    - o Science is distinguished from pseudo-science- or from 'metaphysics'- by its empirical method, which is essentially inductive, processing from observation or experiment.
  - The latter method may be exemplified by astrology, with its stupendous mass of empirical evidence based on observation- on horoscopes and biographics.
  - Popper focuses on four main theories: Einstein's theory of relativity (most important), Marx's theory of history, Freud's psycho-analysis, and Alfred Adler's so-called "individual psychology"
    - o These theories appeared to be able to explain practically everything that happened within the fields to which they referred.
      - The study of any of them seemed to have the effect of an intellectual conversion or revelation, opening your eyes to a new truth hidden from those not yet initiated.
1. It is easy to obtain confirmations, or verifications, for nearly every theory – if we look for confirmations
  2. Confirmations should count only if they are the result of risky predictions that is to say, if unenlightened by the theory in question, we should have expected an event which was incompatible with the theory – an event which would have refuted the theory.
  3. Every 'good' scientific theory is a prohibition: it forbids certain things to happen. The more a theory forbids, the better it is.
  4. A theory which is not refutable by any conveyable event is non-scientific. Irrefutability is not a virtue of a theory (as people often think) but a vice.
  5. Every genuine test of a theory is an attempt to falsify it, or to refute it. Testability is falsifiability; but there are degrees of testability: some theories are more testable, more exposed to refutation, than others; they take, as it were, greater risks.
  6. Confirming evidence should not count except when it is the result of a genuine test of the theory; and this means that it can be presented as a serious but unsuccessful attempt to falsify the theory.
  7. Some genuinely testable theories, when found to be false, are still upheld by their admirers- for example by introducing ad hoc some auxiliary assumption, or by re-interpreting the theory ad hoc in such a way it escapes refutation. Such a procedure is always possible, but it rescues the theory from regulation only at the price of destroying, or at least lowering, its scientific status.

**One can sum all this by saying that the criterion of the scientific status of a theory is its falsifiability, or refutability, or testability.**