Science
- Testability and replicability
- Controls; what is causing what
- Sometimes, it's by mistake, but still want to make sure that it holds true
- Have to make a theory to test something
- Tests yield new theory
- Cycles of induction and deduction

Social science: outcomes are human behaviors and opinions
- Imposes certain limits on scientific method
- Impulse to do so is 2.5 millenia old:

"[G]overnments differ in kind, as will be evident to any one who considers the matter according to the method that has guided us so far. As in other departments of science, so in politics, the compound should always be disaggregated into the simplest elements, or essential parts, of the whole. We must therefore look at the elements of which the state is composed, in order to see how the different kinds of rule differ from one another and whether any scientific result can be attained about each one of them."
-- Aristotle, *The Politics*, Book 1, Chapter 1, c.350 BC.

"So great is the force of laws, and of particular forms of government, and so little dependence have they of the humours and tempers of men, that consequences almost as general and certain may sometimes be deduced from then, as any which mathematical sciences afford us."
-- David Hume, "That Politics May be Reduced to a Science," Essay III in *Essays Moral, Political and Literary*, 1742.

Political science is this method, applied to politics
- Example of experiment in the social science
    - e.g. media effects by Ansolabehere and Iyengar on negative ads;
    - external validity as limitation
    - field experiments (e.g. Gerber and Green: turnout in USA)
- "Quasi-experiments" when the world does that for you
    - Can't repeat it, but pretty clear what is up, e.g. criminality. The number of people in prison is correlated positively with crime.
- Thought experiments, e.g. Axelrod, *Evolution of Cooperation*
- Case study
- Controlled comparison
- Cross-sectional analysis [no time dimension], e.g. former British colonies and democracy

Some clever designs are hybrids, e.g. Putnam.

So what are elements of a good **research design**?
- A specific research question (not simply a topic).
- Measurements of your **dependent variable**. These can be:
    - dichotomous (i.e., yes/no)

- continuous (e.g., 1-27)
- categorical (e.g., blue-green-red)
- some combination of the above
- A set of explanations for why the dependent variable takes on one value or another. (these are **hypotheses**, which define your **independent variables**.)
- Measurements of your independent variables.
- A case or set of cases that will allow you to test which hypotheses are right or wrong. If you have N-1 hypotheses, you must have at least N cases.
- Note: do not "select on the dependent variable" – that is, do not choose cases where the value of the dependent variable is always the same. And of course, do not select simultaneously on the dependent and the independent variables – that is, do not select cases that confirm your hypothesis and exclude others
- A set of appropriate **methods for analyzing** your case or set of cases
- Criteria for deciding when one hypothesis is right or wrong.

How to make sure you do it right:
- Pick very clear, researchable question