Theory and Concept Formation, Formulation of Hypotheses and Models

I Hypotheses

- **Definition**: An assumed relationship between two or more variables.

- **Deterministic** and **probabilistic** hypotheses

- **Types of hypotheses:**

- **if-when hypotheses**
- **the more(less)-the more(less) hypotheses**

- Simple linear relationships => often dramatically under-complex. Think about **options**!

Monotonic relationships:

- linear
- exponential (convex)
- logarithmic (concave)
- s-shaped (diffusion curve)

Non-monotonic relationships:

- u- or hump-shaped

► **causal hypotheses** vs **trend (descriptive) hypotheses**

► **individual, collective/aggregate** or **context** hypotheses

II Theory

- A specified and logically argued provisional answer to the research question.

- A combination of descriptive and causal hypotheses + definitions of fundamental concepts (terms)

Criteria for a good social science theory:

- **possibility of falsification** (Popper-criterion)
- **internal consistency**
- **possibility of empirical testing**
- **concreteness** (valid quasi-indicators for abstract concepts)
- **generalization potential/avoidance of ad hoc-theories**
- **Occam's razor**: *entia non sunt multiplicanda praeter necessitatem*

III Models

Models are as formalized as possible elements of a theory.

Why formalization?

- precise, comprehensible formulation
- if mathematically presented, straightforward deductions
- compatibility of different elements

IV Forecasts

- **Hypotheses** should claim universal validity, irrespective of space and time.

- **Forecasts**, in contrast, are derived from hypotheses and clearly indicate validity conditions of space and time.