Two Metaphors to explain Human Behaviour

Organism Metaphor

- Parts are both causes and effects of the thing, both means and end

- Parts act together but also construct and maintain themselves as a whole

- **Closed to efficient cause (impredicative logic)**

- Human Behaviour: **Concinnity; Embodied and Embedded**

Machine Metaphor

- Parts exist for each other, but not by means of each other

- Parts act together to meet the things purpose, but their actions have nothing to do with the thing's construction

- **Open to efficient cause (predicative logic)**

- Human behaviour: **Computation; Information processing**

Concinnity: Harmony in the arrangement or interarrangement of parts with respect to a whole.

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Two types of mathematical formalism:

component dominant dynamics

The Law of Large Numbers (Bernouiili, 1713) +
The Central Limit Theorem (de Moivre, 1733) +
The Gauss-Markov Theorem (Gauss, 1809) +
Statistics by Intercomparison (Galton, 1875) =
Social Physics (Quetelet, 1840)

Collectively known as:
The Classical Ergodic Theorems

Molenaar, P.C.M. (2008). On the implications of the classical ergodic theorems: Analysis of developmental processes has to focus on intra individual variation. *Developmental Psychobiology, 50*, 60-69

interaction dominant dynamics

Deterministic chaos (Lorenz, 1972)
(complexity, nonlinear dynamics, predictability)

Takens' Theorem (1981)
(phase space reconstruction)

Systems far from thermodynamic equilibrium
(Prigogine, & Stengers, 1984)

SOC / $\frac{1}{f^{\alpha}}$ **noise** (Bak, 1987)
(self-organized criticality, interdependent measurements)

Fractal geometry (Mandelbrot, 1988)
(self-similarity, scale free behaviour, infinite variance)

Aczel's Anti-Foundation Axiom (1988)
(hyperset theory, circular causality, complexity analysis)