**Resource Management:**
**INSTITUTIONS AND**
**INSTITUTIONAL DESIGN**
SOS3508
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## Behaviour and Interactions
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# Lessons from the natural sciences

- Between scientific disciplines there are relations of reduction or analogy
  - Reductions may be an important engine for scientific progress (some current links between psychology and biology), or it may be premature, crude, or speculative
  - Analogies may provide valuable hypotheses but cannot provide evidence. Sometimes the analogy may provide thought worlds inimical to scientific progress (the organism analogy of society)

# Physiology and neuroscience

- Basis for human behaviour
  - Fear: two different pathways from perception to emotional reaction, one going by way of cognition (taking longer providing more detail)
  - Memory affected by levels of stress induced hormones (too high gives no (conscious) memories)
  - Trust: trust game experiments shows
    - When reciprocity is above what pure rational choice suggests it is affected by the hormone oxytocin making people less "betrayal averse" (rather than "risk averse")
    - An emotional foundation for punishing of unfair behaviour. Punishing provided stimulus for pleasure centre of the brain
  - Filling in capacity of the brain explains the quest for meaning in all information gathered

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# Explanation by consequences

- Reinforcement
  - If we notice positive consequences we may choose to repeat our action
  - Learning by reinforcements
    - Rewards by fixed or variable ratio schedules
    - Rewards by fixed or variable intervals
  - Learning may be extinguished by removing the reward.
    - This happens faster if the reward has been on fixed frequent ratios
  - To explain behaviour reward schedules needs to occur naturally and be opaque
    - This do not happen often with fixed schedules
  - Response patterns generated by reinforcements will seldom conform to rational choice theory
    - Responses will maximise average reward rather than marginal as rational choice would dictate

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# Differential reproductive fitness

- Selection
  - Agents may be selected by the environment rather than adapt to it
    - Human's consciously decide in breeding animals or plants based on their behavioural characteristics
  - Differential survival of organisms in natural settings will, across generations, increase the frequency of behaviour that increase reproductive success
    - This is called natural selection

# Natural selection

- Optimize fitness measured by number of offspring
- Determined by environment and physiological and behavioural properties (phenotype)
- Genotype determined by DNA, a code written by the nucleotides T, A, G, C
  - Each "word" (or codon) of the code is a triplet of these
- Gene is a segment of DNA coding for one particular protein
- Small mutations will delete, insert or substitute one of the nucleotides
  - Evolution can be seen as an analogy to the substitution of letters in a word or sentence: will it still be meaningful? Can meaning be achieved in more than one step?
- Natural selection will generate local maxima

# Why local maxima?

Small marginal mutations
- Cannot use indirect strategies, descendants have to survive
- Cannot wait for the mutation be become an improvement
- Cannot anticipate what will be an improvement in a changing environment

Caveats
- Large mutations occur
- Change across generations do not eliminate all "sub-optimal" adaptations providing for possible new starts

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# The units of selection

- Natural selection is opportunistic and myopic and usually fiercely individualistic
- Exceptions
  - Kin selection when seemingly altruistic behaviour increase the survival of kin carrying the same genes
  - Group selection can occur if punishment of non-cooperators is feasible (requires identification of non-cooperators)
- Kin and group selection may explain cooperative behaviour
  - Reciprocal altruism is a third mechanism, but would seem implausible in large groups since it requires the "grim trigger" strategy

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# Selection and human behaviour

|  | Intentional source of variation | Non-intentional source of variation |
|---|---|---|
| Intentional selection | Plant and animal husbandry | Gradual improvement of boats<br>Eugenics<br>Selective abortion and infanticide |
| Non-intentional selection | Firms in market competition | Natural selection |

# Natural selection

Non-intentional variation and selection

• Emotions may provide for a mechanism where genes affect certain types of behaviour (jealousy, anger against defectors, contempt against breaking moral norms, self deception, …)

– Murder of wives and stepchildren
– Propensity to punish non-cooperators
– ???

# Deliberate selection

Intentional variation and selection
- Animal and plant breeders, GMOs

Non-intentional variation  -"-
- Sundt's example of improvements in boat design as arising from imperfect copying of earlier good boats and seamen noticing improvements
  - Leads to local maxima
  - Leads to intentional variations as builders start experimenting

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# Market competition

Intentional variation, non-intentional selection
- Type 1: all firms try to maximise profits, imperfect copies of more successful firms may provide improvements
- Type 2: firms are satisficers engaging in search for improvement only when profits fall below a threshold

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# Selection models in social science

- With high rates of change in the environment, firms needs to anticipate change to keep even with competitors
- Large firms and lobbying groups may be able to shape the environment ( cpr.: path dependence mechanism)
- Modelling markets: There is a vast space between "improving efficiency" and "maximizing returns"
  - Compare: Adaptive efficiency (North 2005)
- Electoral market models do not do justice to variations in motives among politicians (opportunists, reformers, activists). Not all politicians are votre maximizers
- Outside arenas of competition the selection model of "as-if" rationality is even less plausible
- Constraints (before the fact) and selection (after the fact) contribute to explain behaviour. But **choice** is the core concept to understand

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