1. Modelling

1.1 Overview

A. What is a model?

B. What is a good model?

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B. What is a good model?

A. A model:

- a simplified picture of a part of the real world.
- has some of the real world's attributes, but not all.
- a picture simpler than reality.

We construct models in order to explain and understand.

Three Rules of Thumb for Model Building:

- **Think "process".**
- **Develop interesting implications.**
- **Look for generality.**

Judge models using: truth, beauty, justice.

Interplay between the real world (truth), world of æsthetics (beauty), world of ethics (justice), and the model world.

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Example: The firm —

Prices, Costs, and Values → Profits

We use verbal, graphical, and algebraic models of how consumers, firms, and markets work.

We assume rationality: that economic actors (consumers and firms) will not consistently behave in their worst interests.

Not a predictive model of how individuals act, but robust in aggregate.

1.2 Modelling

Speculations about human behaviour/social and organisation interactions.

Explore the arts of

- **developing**
- **elaborating**
- **contemplating**
- **testing**
- **revising**

models of behaviour.

What is a model?

— We can have several models of the same thing, depending on which aspects we want to emphasise, how we will use the model.

— Models are constructs to explain and appreciate the real world.

So ...

Need *skills* of:

- ***abstracting*** **from reality**
- **squeezing** ***implications*** **out**
- ***evaluating*** **a model**

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- **— *abstracting* from reality**
- **— squeezing *implications* out**
- **— *evaluating* a model**

We can produce more complex behaviour than we are capable of understanding:

> **the behaviour of a baby baffles a psychologist (and vice versa)**

If we cannot understand individual behaviour, then how are we to understand systemic/social/bureaucratic behaviour?

Six familiar models in the social sciences:

- individual choice under uncertainty
- exchange
- adaptation
- diffusion
- transition
- demography

Each is treated by March & Lave.

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4. Are these *true*? If not, speculate on other models/processes.

Case 1: Contact and Friendship.

Why are some people friends and not others?

e.g. In a hall of residence,
lists of friends

Observe: friends live close together.

Process?

What is a possible process that might produce the observed result?

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Generalisation

We want to include earlier predictions but find a more general model that predicts new behaviours as well, more widely.

Can we generalise this?

- **beyond the university?**
- **communication $\rightarrow$ friendship?**
- **enemies as well as friends?**

Case 2: Responsibility Changes

If, in a committee, people in authority tend to moderate their beliefs and actions as a result of confrontation with the actual consequences of their beliefs and of exposure to alternative ideas, then

→ **politically good to include "extremists"**

- **seen to represent faction**
- **moderate own views**

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3. **Generalise: busy people forget things**

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   Much of the *fun* in model building comes in finding interesting implications in your models. A good strategy for producing interesting predictions: look for natural experiments.

3. **Look for generality**
   Ordinarily, the more situations a model applies to, the better it is and the greater the variety of possible implications.

1.5 Evaluation of Speculative Models

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II. Beauty
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Beauty:

- **Simplicity, or parsimony**
- **Fertility (many predictions/assumptions)**
- **Surprise!**

e.g. Parental preference for sons.

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A Surprise —

$\rightarrow$ **for society: more girls than boys,**

but —

for most couples: more sons than daughters.

Truth:

- correct (or more correct) models
- requires clever, responsible detective work to find the truth
  (aim for objectivity, but face subjectivity if it exists)
- test derivatives, not assumptions
- predicting is not equivalent to understanding, necessarily

Beware Circular Models:

a. "when the rain-dance ceremony is properly performed, and all the participants have pure hearts, then it will rain" — testable?

b. "people pursue their own self-interest" — don't predict values from behaviour and then predict the same behaviour from the values just derived.

c. Monty Python's "the man who claims he can send bricks to sleep"

Critical Experiments:

compare alternative models
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4. The Case of the Stupid Question

e.g. "a surfer asked a stupid question in class"

Speculations:

A. not enough time to study
B. success on the board is sufficient for her
C. jealous of her prowess at surfing, the rest of us look down on her classroom performance and interpret her questions as "stupid"

How do the Implications Differ?

	Speculation		
	A	B	C
Q1: will athletes ask stupid questions out of season?	no	yes	yes

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	Speculation A	Speculation B	Speculation C
Q1: will athletes ask stupid questions out of season?	no	yes	yes
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Q3: will athletes who don't look like athletes ask stupid questions?	yes	yes	no

The Importance Of Being Wrong

— evaluate rather then defend (avoid “falling in love” with your model)

— delight in finding fault — be skeptical and playful

— always think of alternative models