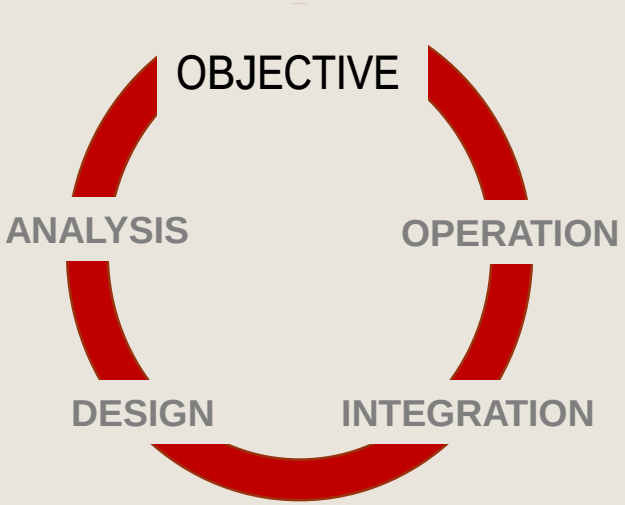

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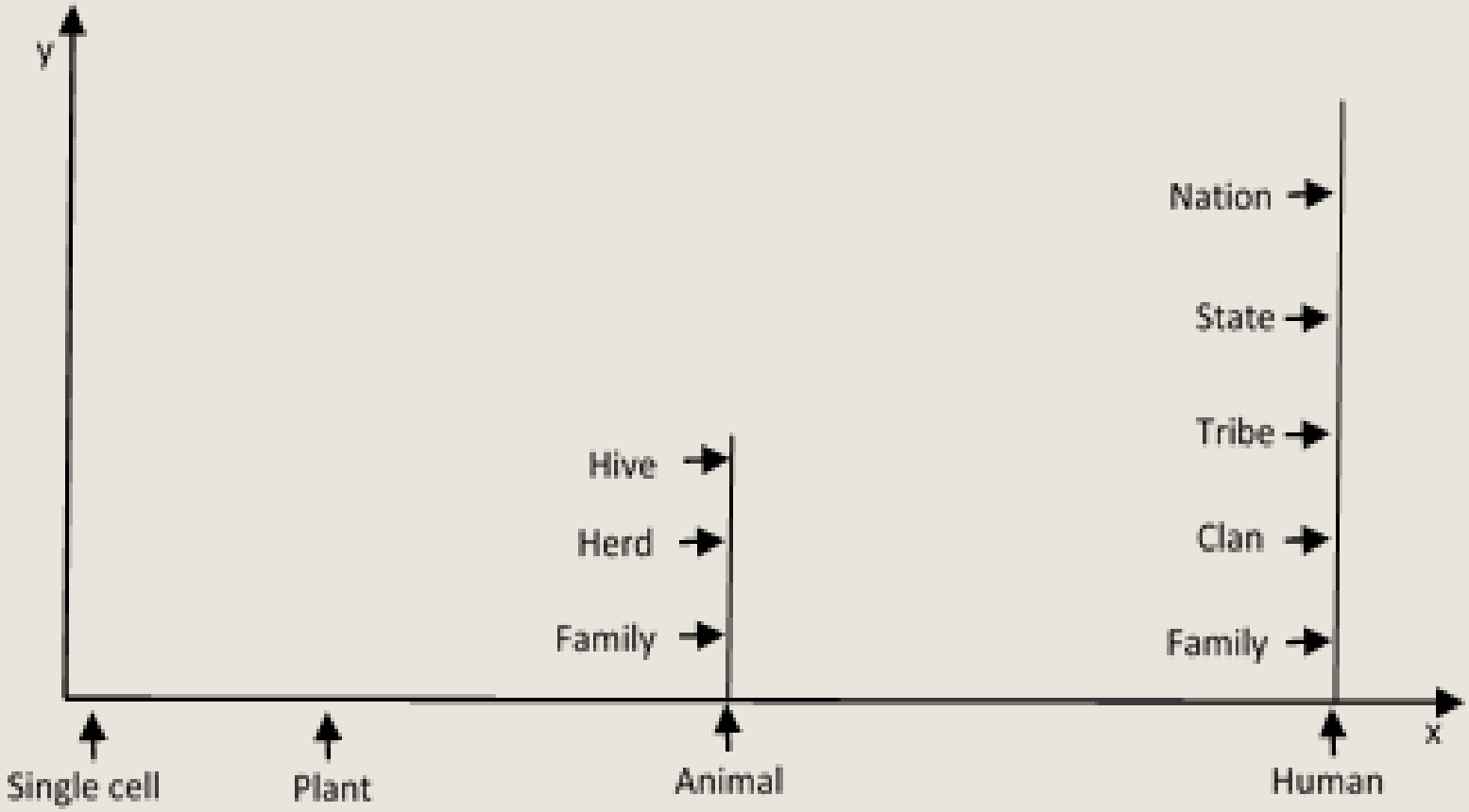
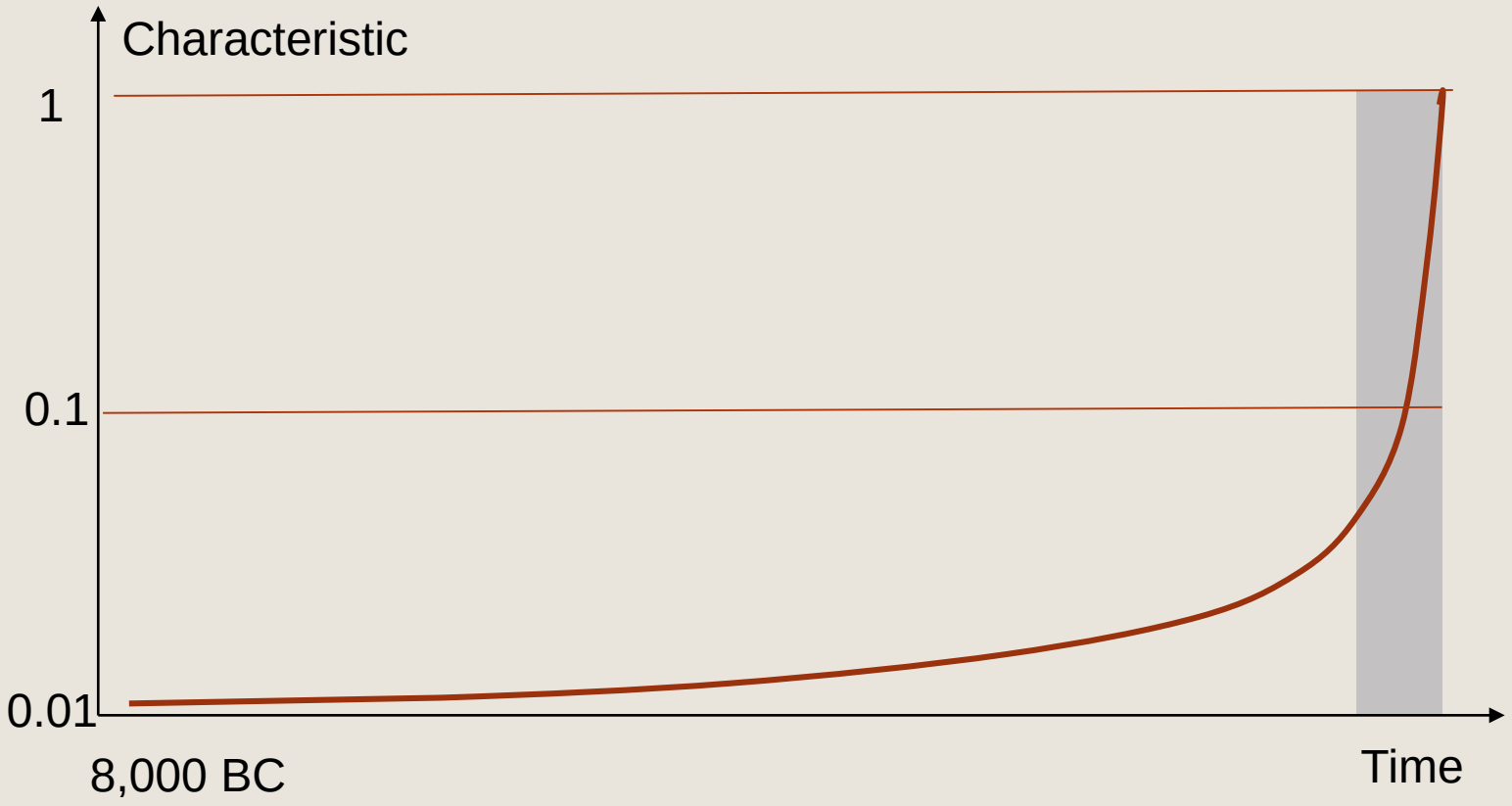
The individual, society, and the role of information

Presentation to the Symposium on Complexity, Criticality and Computation
Sydney University, 11-13 December 2017

Evolution in two dimensions:



Evolution of society:

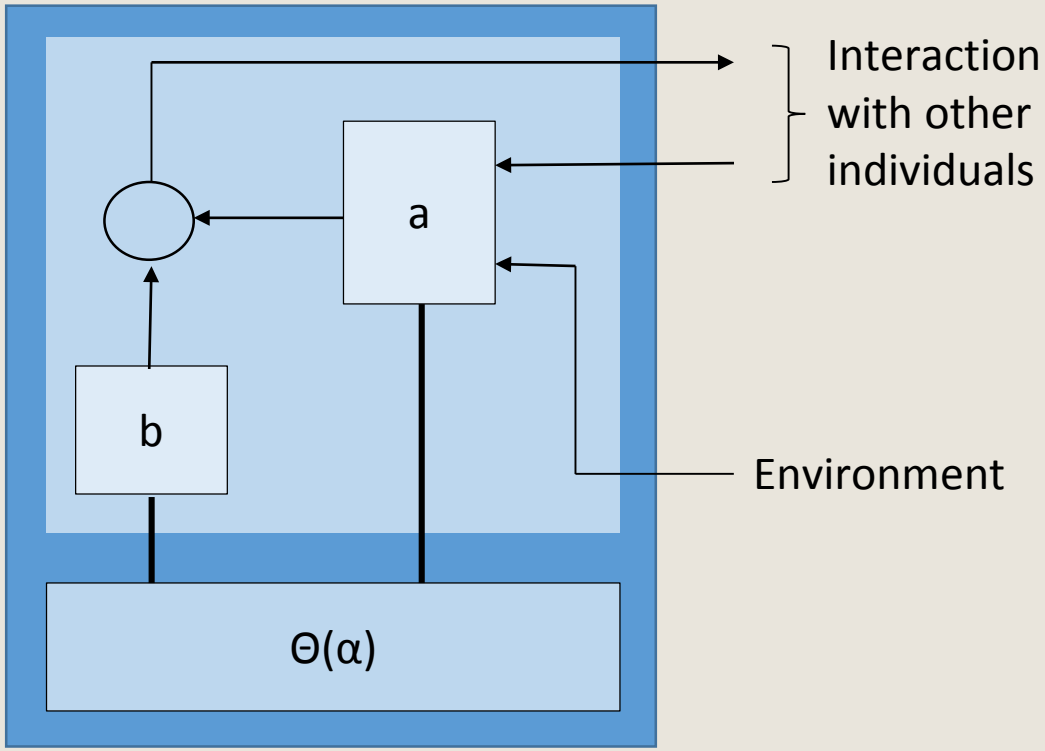


Society as an information-processing system, composed of:

- *Individuals* – all identical
- *Interactions* between individuals, in the form of exchanges of information items
- Both embedded in an *environment*

All parameters are *averages*.

Functionality of the individual - two processes:



Definitions so far:

μ	The rate of input from other individuals, in items per unit time
μ_a	The rate of input from the environment, in items per unit time
Θ	A subset of the knowledge base containing the information items that make up the individual's identity (or attitude)
w	The size of Θ (number of information items)

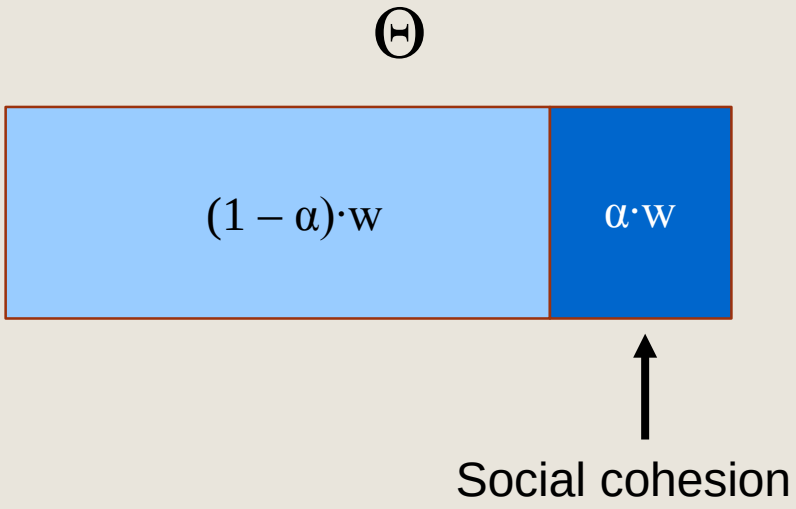
Alignment between two identities:

$$\alpha_{i,j} = \frac{1}{w}\left[\Theta_i \cap \Theta_j\right]$$

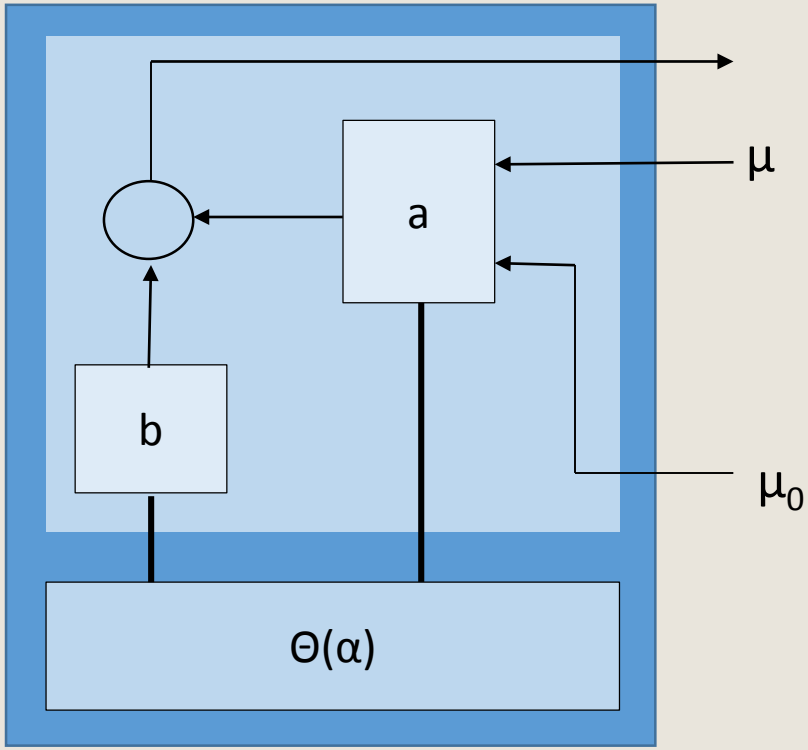
Social cohesion:

$$\alpha = \frac{1}{n(n-1)} \sum_{i,j \neq i} \alpha_{i,j}$$

Two parts of the identity:



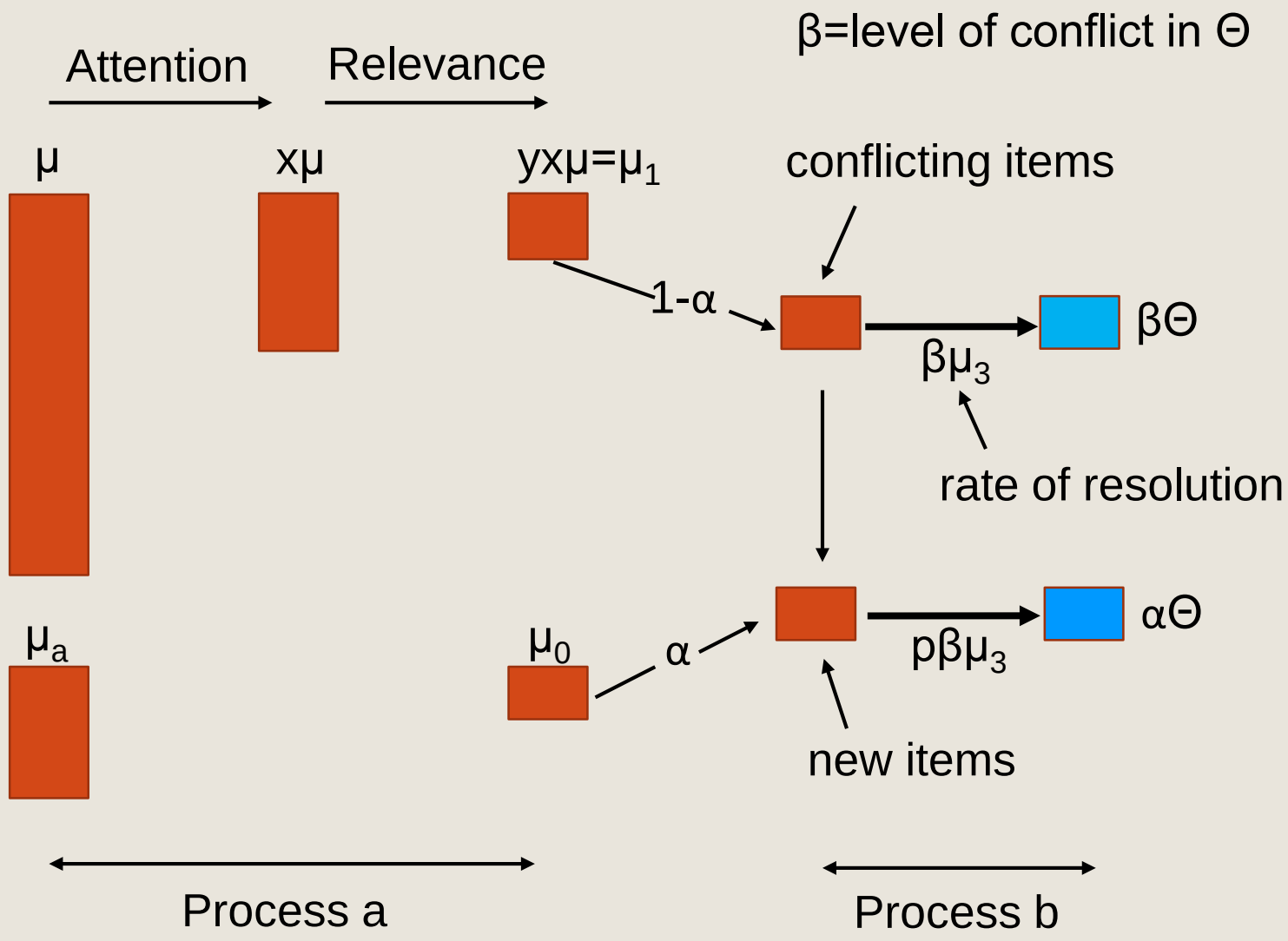
Functionality of the individual - two processes:



Three types of inputs (parts of μ):

1. Inputs requiring no active engagement
2. Inputs associated with our normal, daily activities (work, study, family, sport, etc.)
3. Inputs that relate to our current beliefs; i.e., to items in Θ

An important characteristic is *attention* – focused mental engagement on a particular information item. Part 1 requires none, whereas parts 2 and 3 do.


β=level of conflict in Θ
Attention
Relevance
μ
xμ
yxμ=μ1
conflicting items
1-α
βΘ
βμ3
rate of resolution
μa
μ0
α
αΘ
pβμ3
new items
Process a
Process b

Resolution of conflict:

Either

reject the conflicting item of information

or

accept it, in which case $\alpha \rightarrow \alpha + 1$

The probability of acceptance is *p*, which then becomes a measure of the *persuasiveness* of the item of information.

Flow of conflicting items

Rate of resolving conflicts

$$w\frac{d\beta}{dt} = \mu_1 \cdot (1-\alpha) - \mu_3 \cdot \beta$$

Rate of persuasion

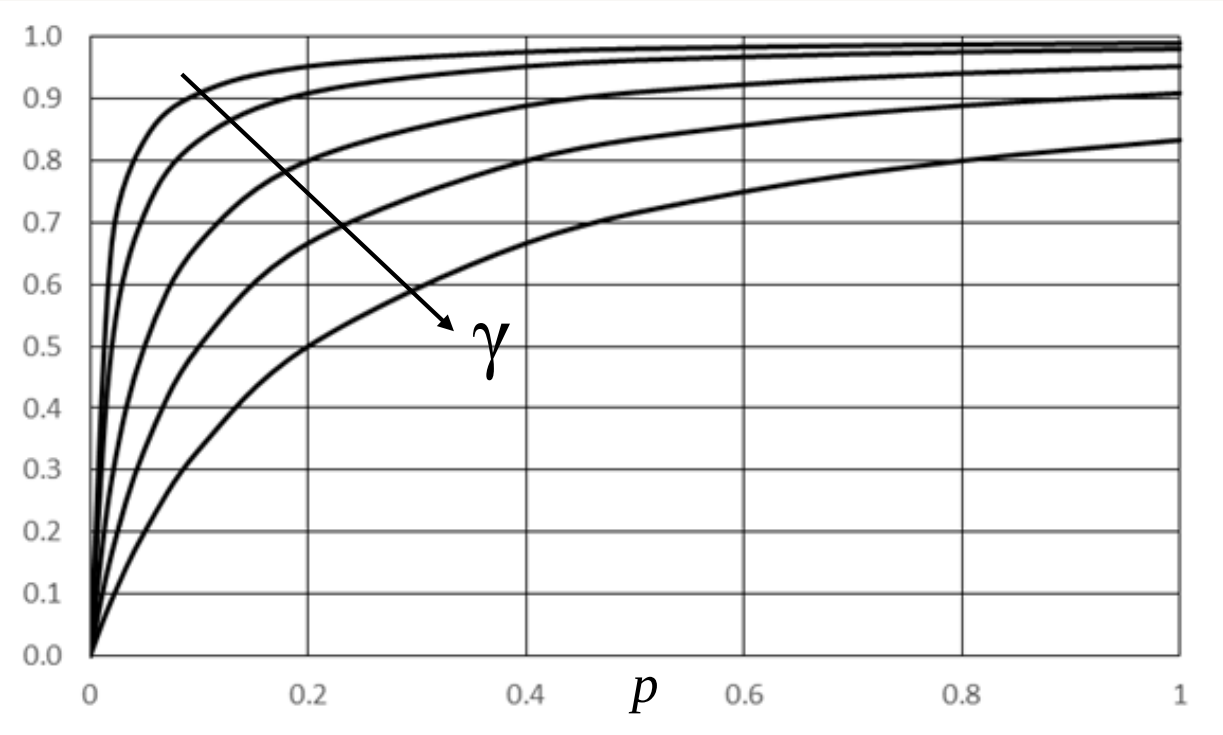
Flow of new items removing common items

$$w\frac{d\alpha}{dt} = \mu_3 \cdot p \cdot \beta - \mu_0 \cdot \alpha$$

$$\alpha = \frac{p}{p + \gamma}$$

where

$$\gamma = \mu_0/\mu_1$$



$$\beta = \frac{\gamma}{p+\gamma}\frac{\mu_1}{\mu_3}$$

and the condition

$$\beta \leq (1-\alpha)$$

leads to the limit (Fletcher's I-limit?)

$$\frac{\mu_1}{\mu_3} \leq 1$$

i. The IT industry represents a huge investment.

ii. This investment is increasingly in private ownership.

iii. The ownership in increasingly concentrated in a **very** small segment of society; what has been called the Transnational Capitalist Class.

iv. With ownership comes control and power.

v. There is limited societal governance of this IT industry.

Two approaches to perverting the operation of the collective intelligence:

Selective presentation (promotion and suppression) – increasing *y*

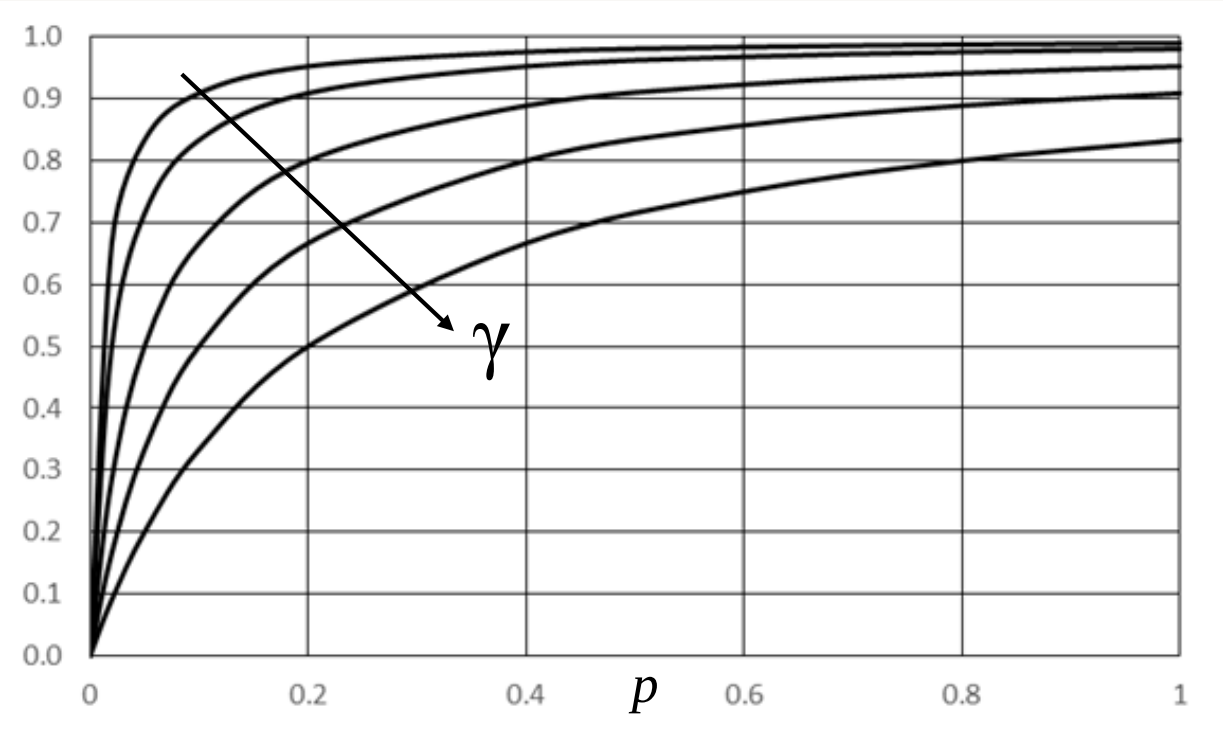
and

Association with accepted beliefs (cognitive advantage) – increasing both *x* and *p*

$$\alpha = \frac{p}{p + \gamma}$$

where

$$\gamma = \mu_0/\mu_1$$



Questions?