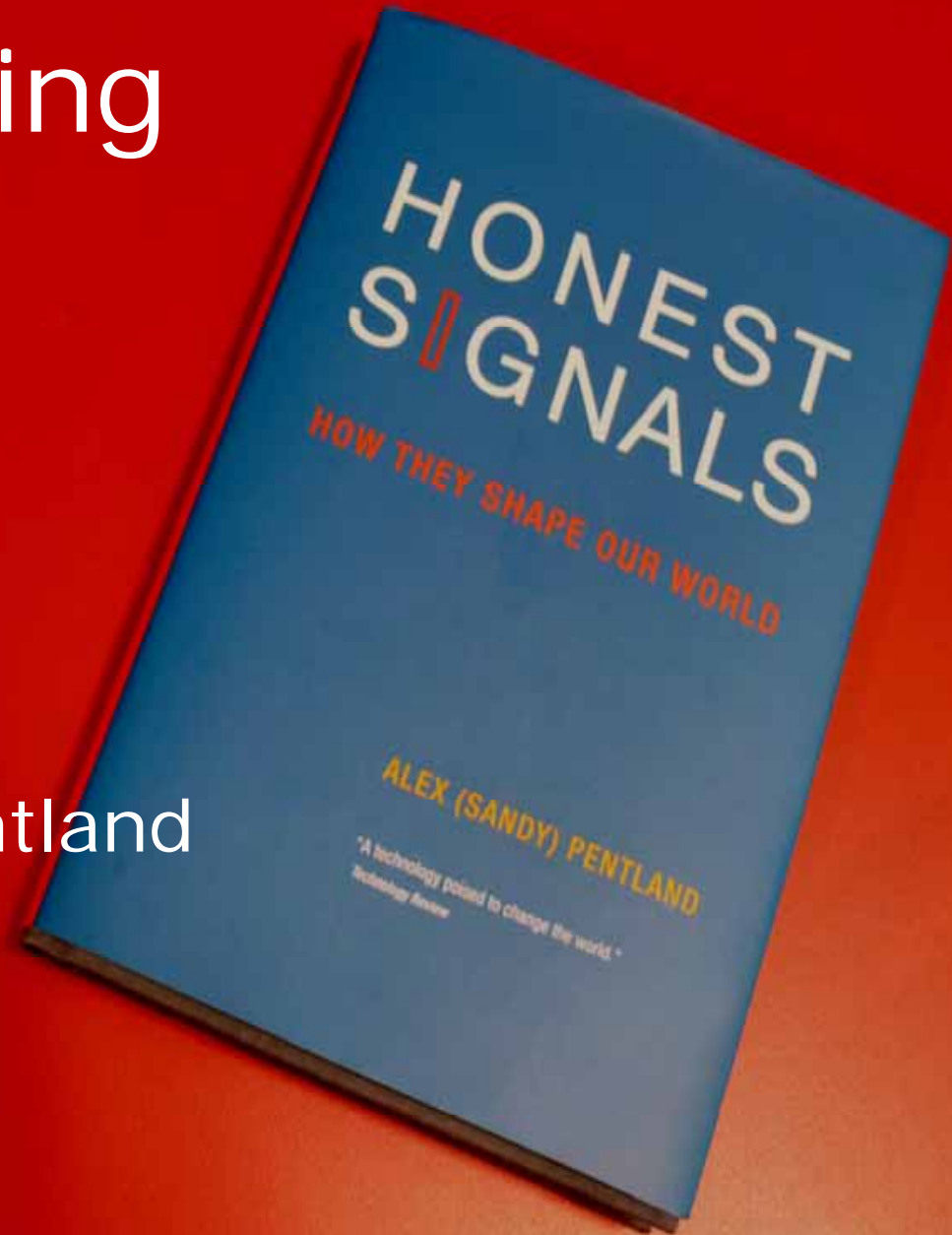


Reality Mining For Health

Alex (Sandy) Pentland
David Lazer
Devon Brewer
Tracy Heibeck



Honest Signals: A new framework for analysis of human interactions



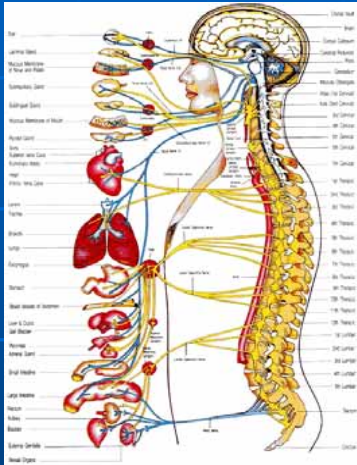
Nature, 1/09

- Not affect or cognition
- Unconscious signaling and response; a social sense
- Requires many seconds of observation (~ 30 seconds)
- People can use it to accurately predict behavior

‘People have been studying this for a long time, but Alex is raising it up to another level.’
Nature, 1/09

Honest Signals Coordinate Human Behavior

INTEREST

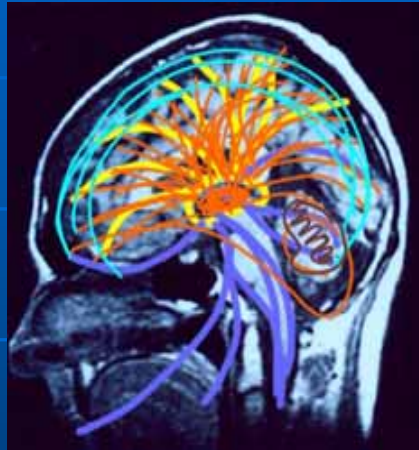


autonomic



ACTIVITY

ATTENTION

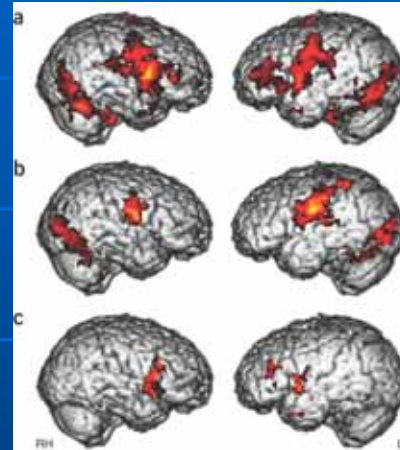


thalamic attention



INFLUENCE

EMPATHY

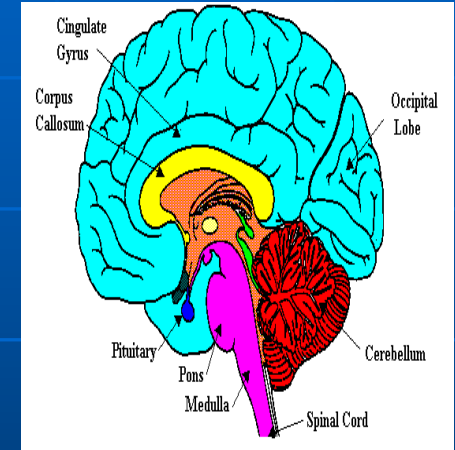


mirror neurons



MIMICRY

ACTION



cerebellar motor



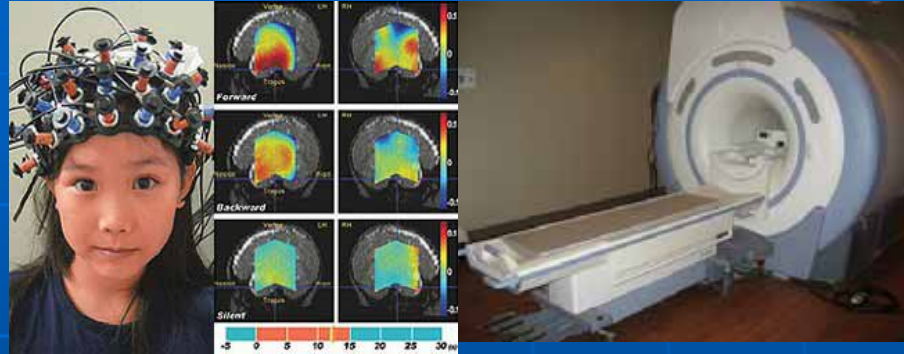
CONSISTENCY

Honest signals CAUSE response in others

Honest Signals for Behavioral Neuro-Economics

reading brain state from behavior

Instead of this:



You can use this:



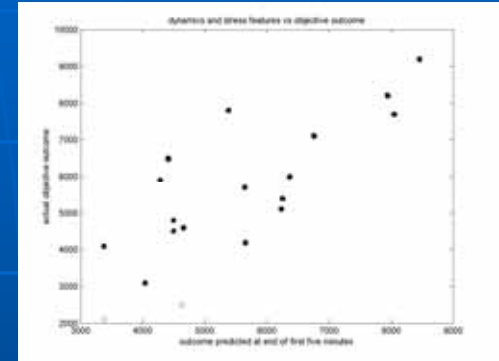
So: we can `x-ray`
entire organizations

2300 experiment hours for 800 people
1000 full workdays phone data for 84 people
80 years continuous phone data for 170 people

Honest Signals shape your life

Sales, salary negotiation:
up to 30% increase

your pay



your signals



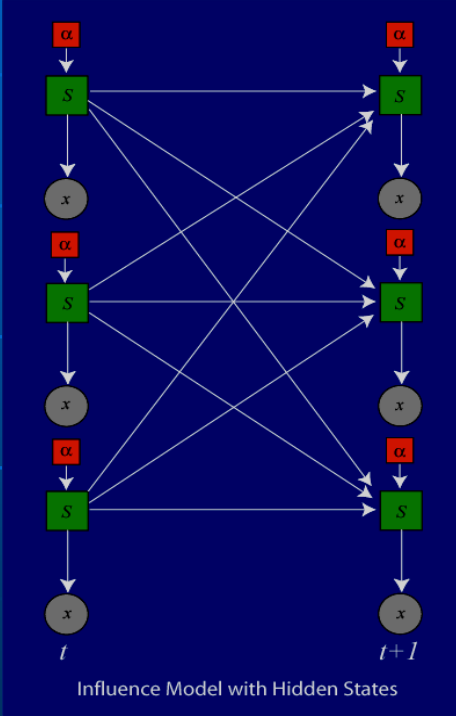
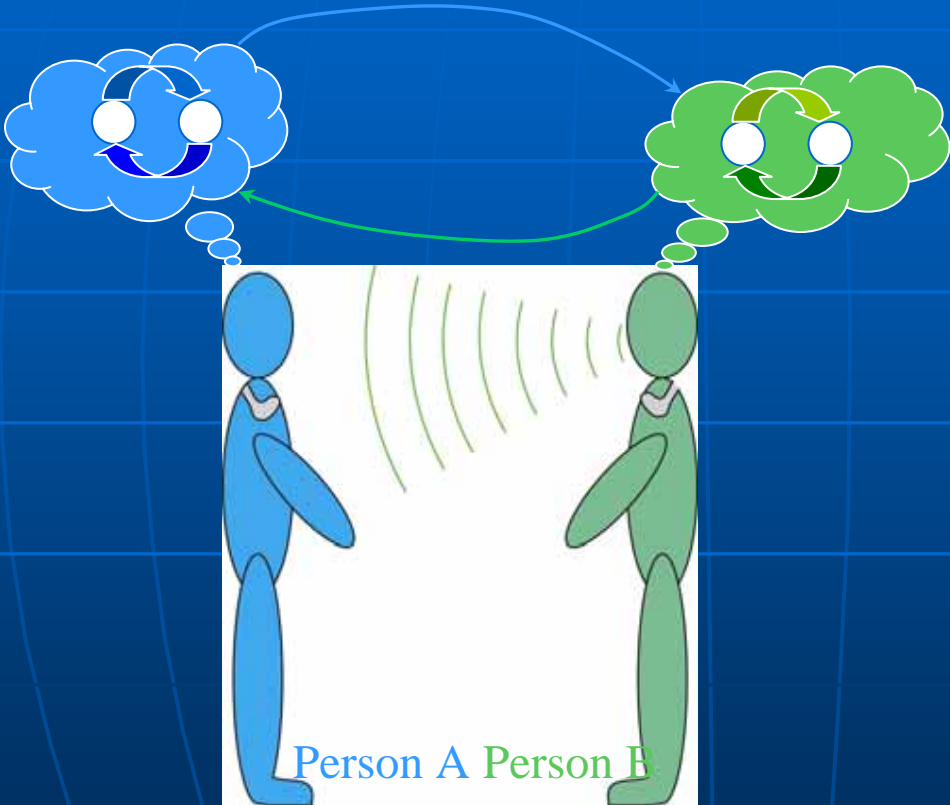
Hiring and dating:
signals that work

Pitching your vision:
success and charisma

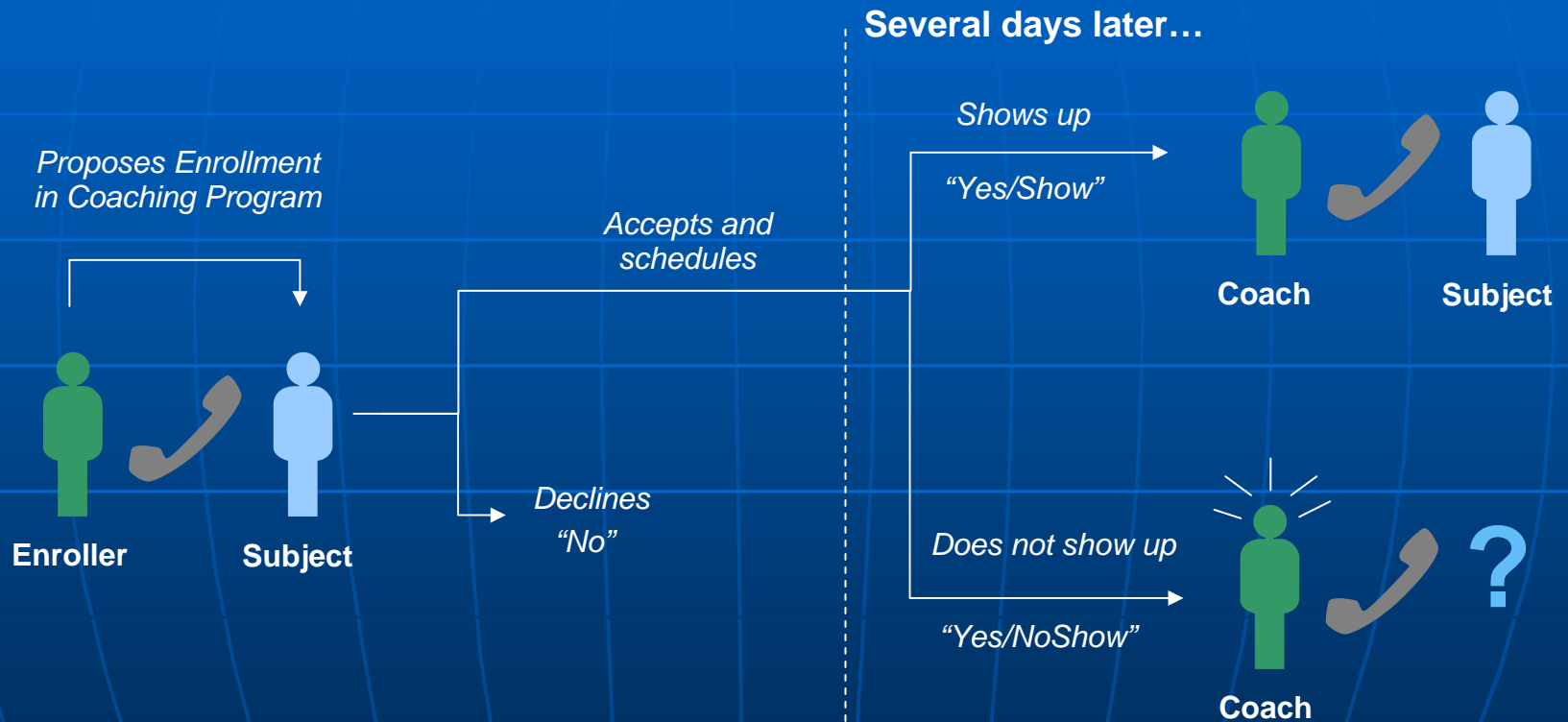


2300 hours of experiments with 800 people

Coupled HMMs Of Signal-Response



A Commercial Project



Outcomes

Predicted vs. Actual Outcomes

Predicted	Actual		
	No	Yes/NoShow	Yes/Show
Yes/Show		10	20
Yes/NoShow		10	5
No	20		

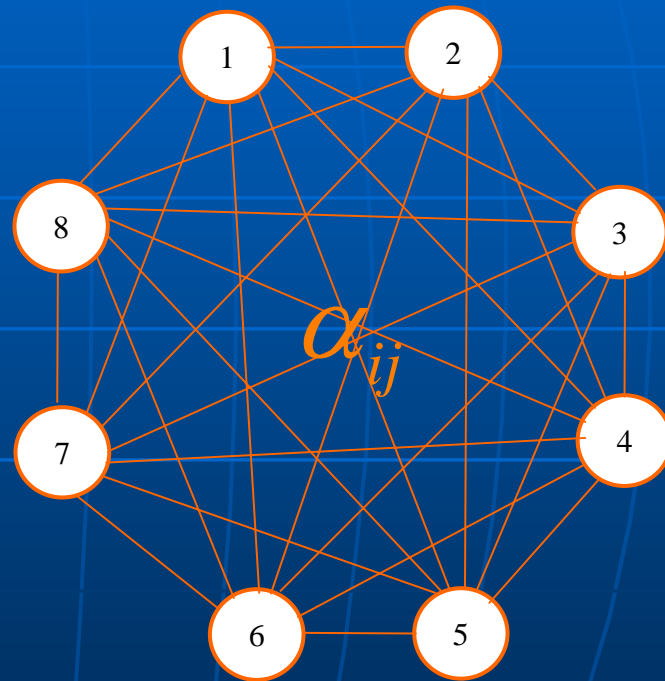
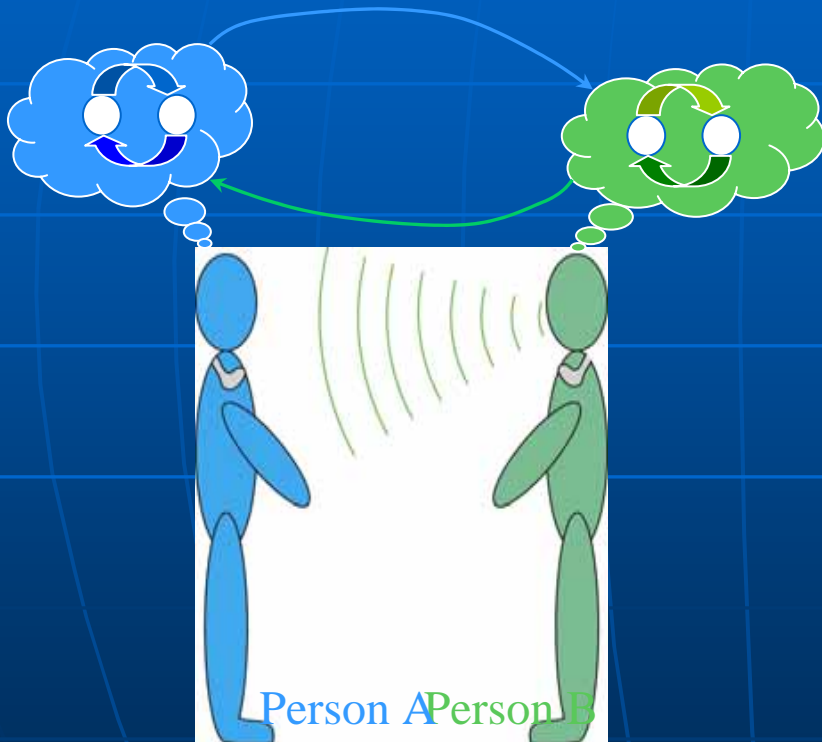
Results

- Overall Accuracy at classifying Yes/Shows and Yes/NoShows was 78%
- When predicted a Yes/Show, it was correct 73% of the time
- When predicted a Yes/NoShow, it was correct 84% of the time

CogitoHealth

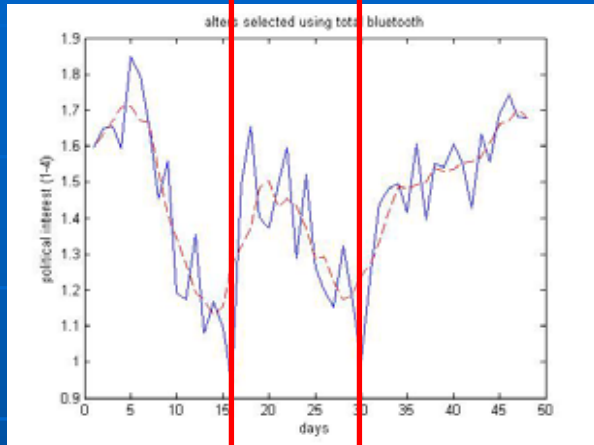
info@cogitohealth.com

Networks of Interactions

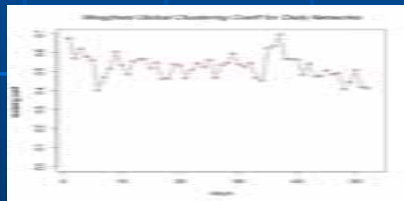


$$P(S_t^i | S_{t-1}^1, \dots, S_{t-1}^N) = \sum_j \alpha_{ij} P(S_t^i | S_{t-1}^j)$$

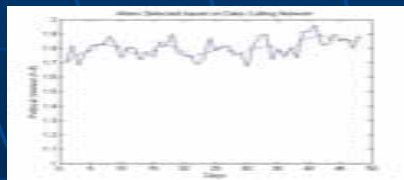
f2f Exposure



f2f exposure



Not special events



Not calls, etc

- key in infection
- changes opinions too!

Madan, Lazer, Pentland

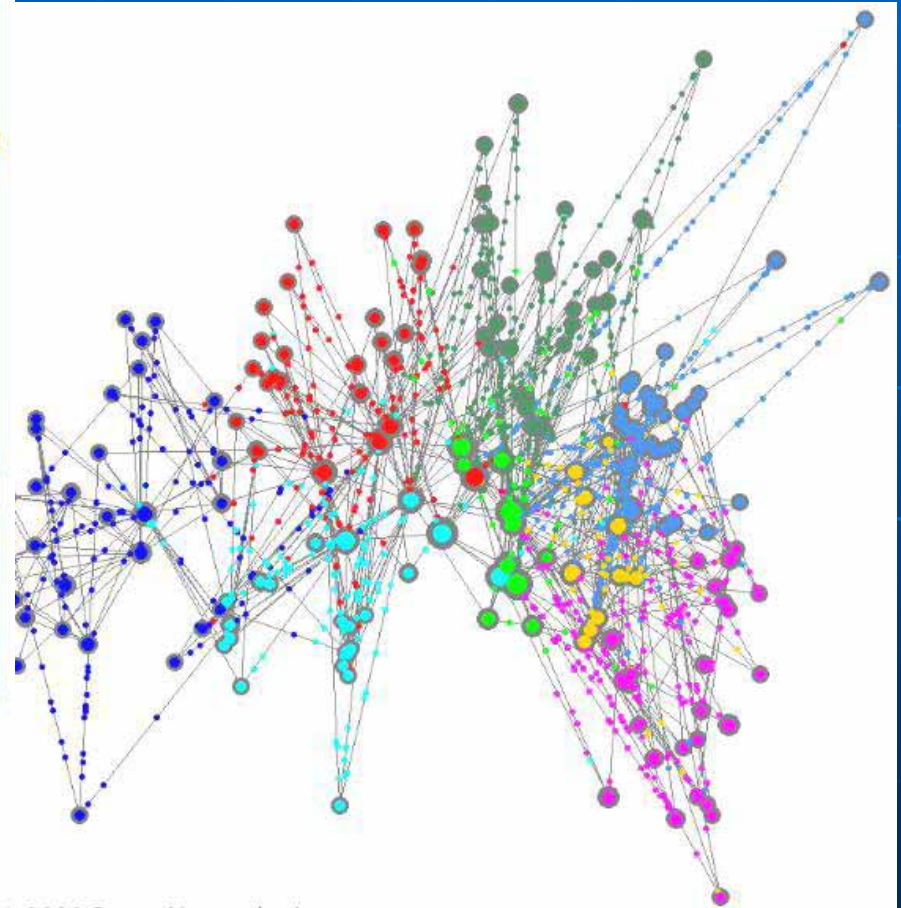
Signals In The Wild

The Next Google - cover Newsweek

The Next Net – cover BusinessWeek



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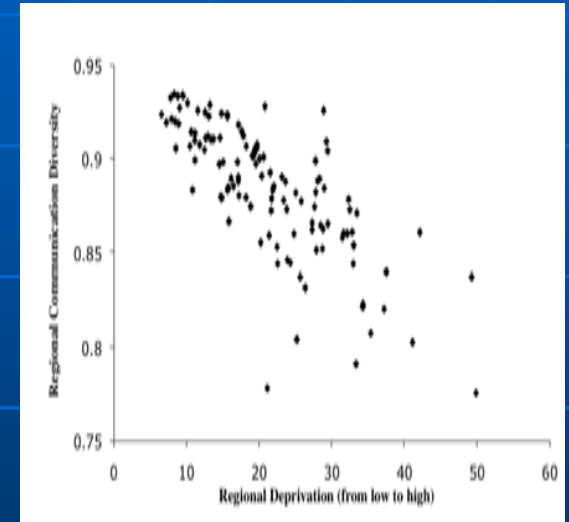
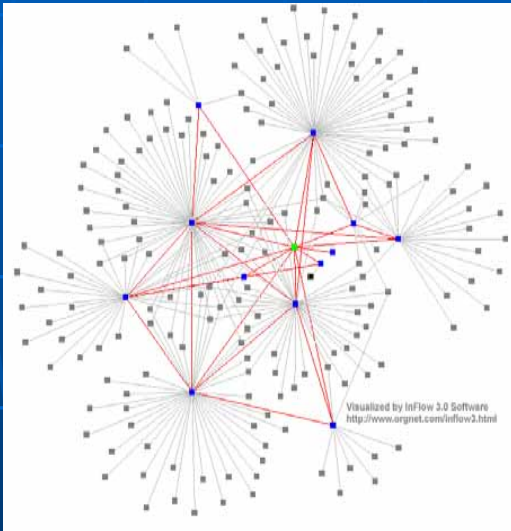


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Sense Networks

Cohesive Communities Drive Learning Information Ghettos Are Poor and Sick

Healthy communities have both exploration and cohesion



(Eagle)

Breakthrough Idea of the Year
Harvard Business Review



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