



Conceptual Innovations and Major Transitions

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$$\frac{\partial f}{\partial x} = 0 \Rightarrow y = 0$$
$$1 - y - 2x = 0$$
$$\Rightarrow x = \frac{1}{2}(1 - y)$$
$$\frac{\partial f}{\partial y} = 0 \Rightarrow x = 0 \text{ or}$$
$$1 - y = 0$$

A remarkable transformation

Pleistocene (12kya)

- Hunter-gatherer bands
- Most are kith and kin
- Generalized reciprocity
- Kin-based production
- Consensus, influence

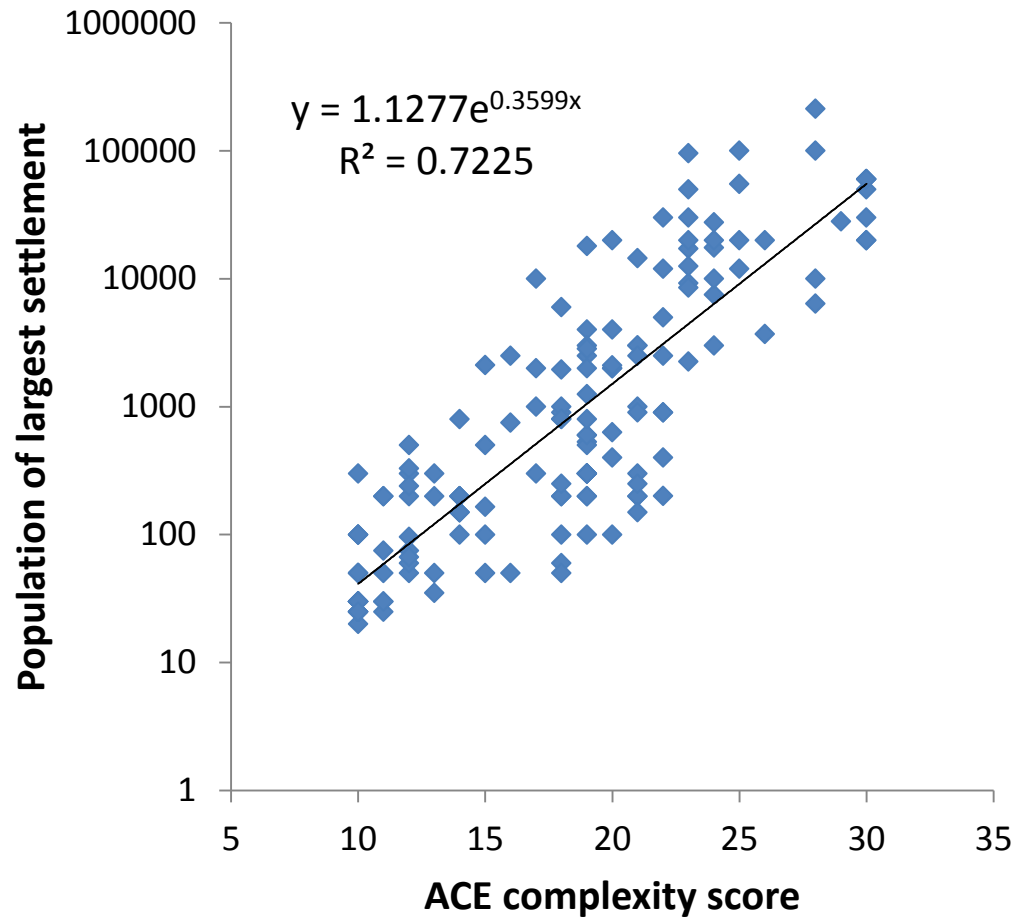
Today

- Nation-states
- Anonymous strangers
- Economic exchange
- Firms, specialization
- Bureaucracy, laws

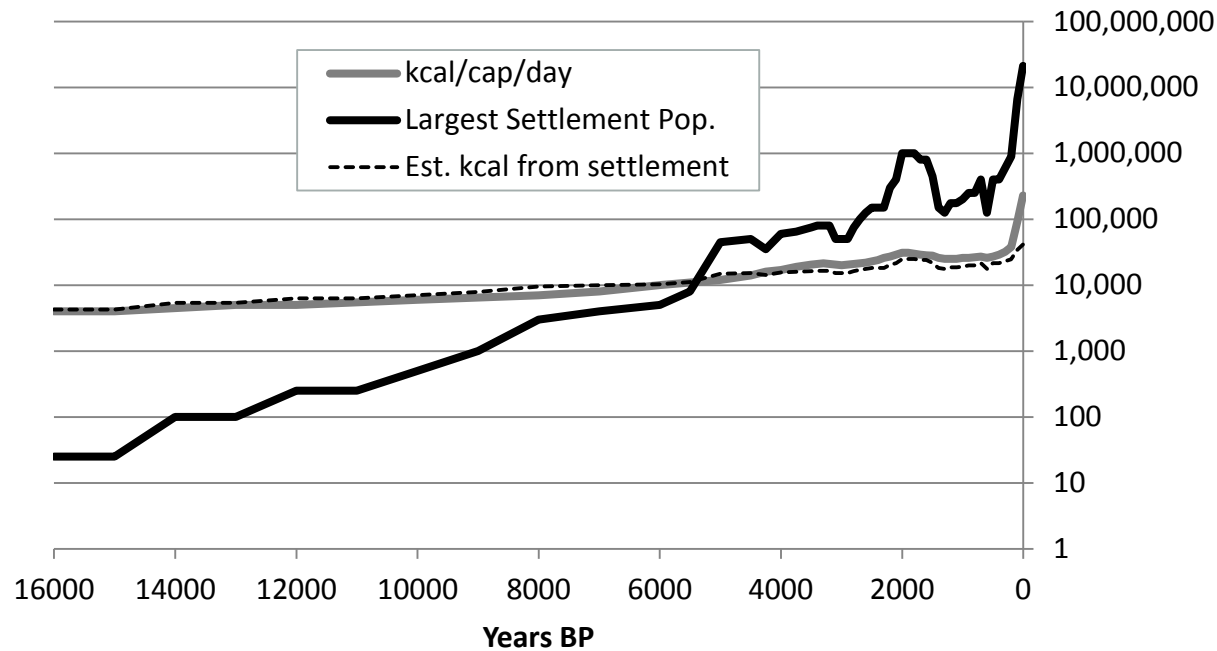
How to measure this process?

Population of the Largest Settlement

- Good proxy for overall complexity (Naroll, Chick)
- Relationship to division of labor, Zipf's Law
- Archaeologists pay attention to big sites

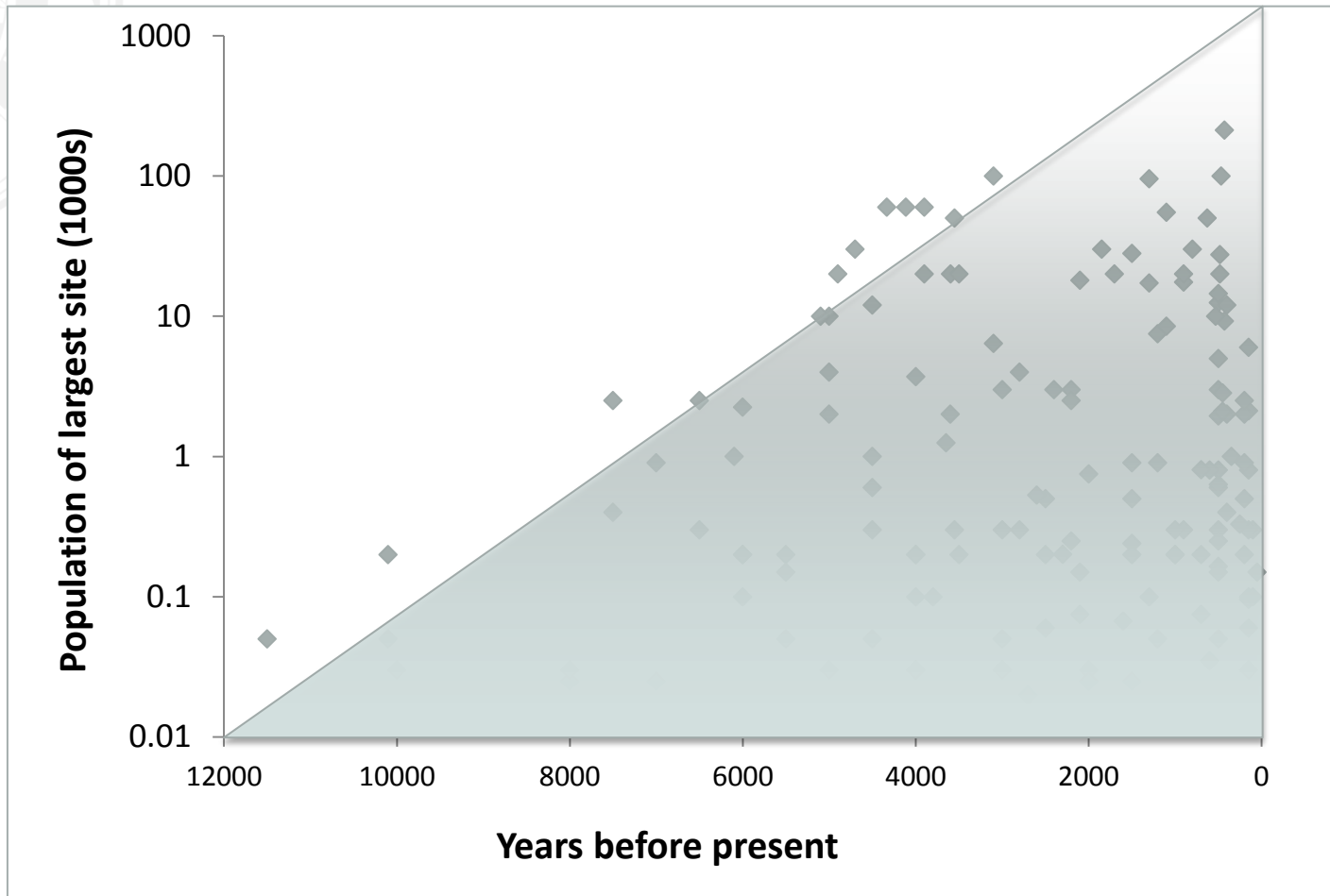


Scale and technology (energy capture)

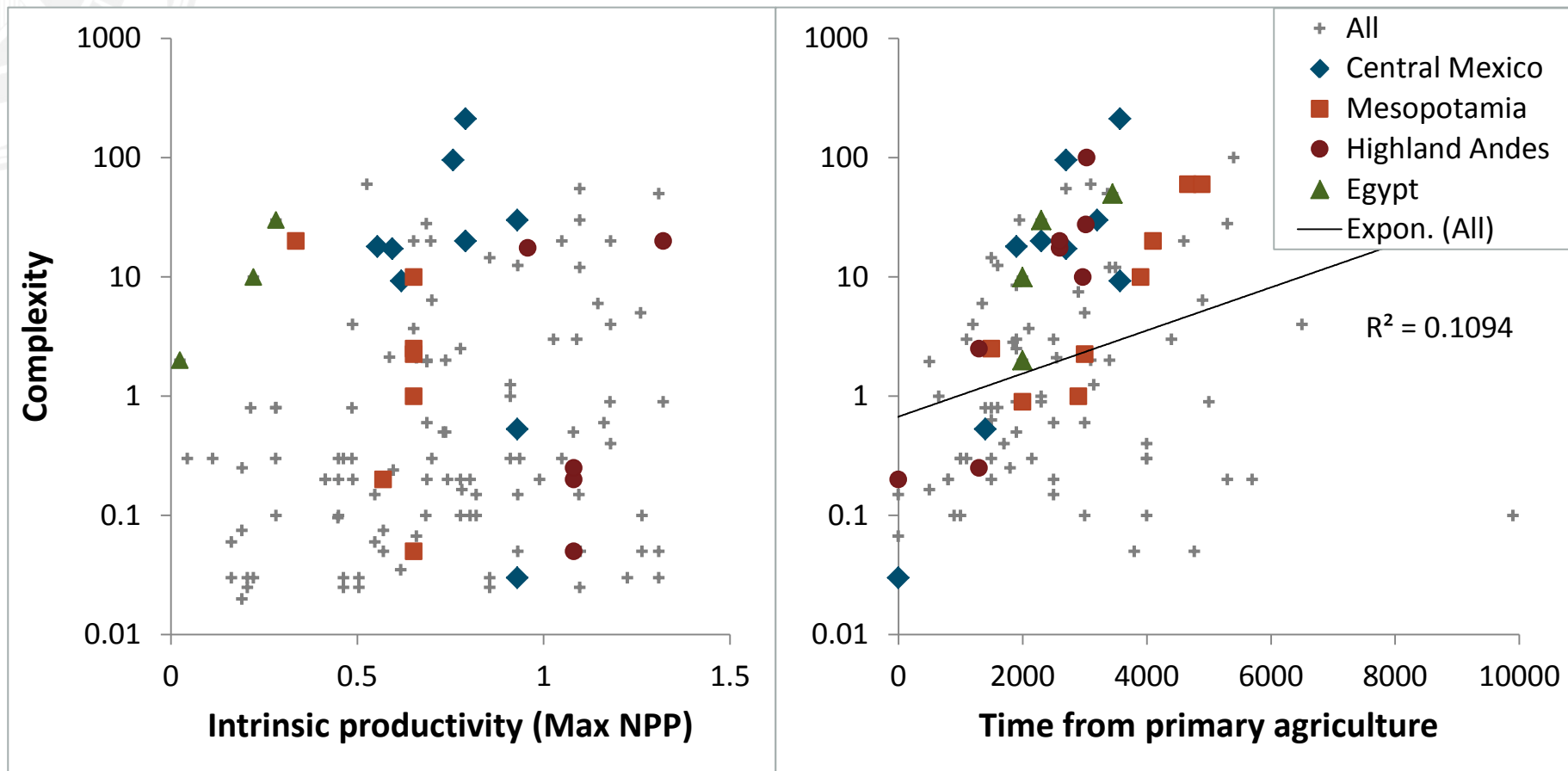


The history of energy capture and social organization in Western civilization, 16,000 BP to the present. The dashed line represents $y_t = y_0 N_t^{1/6}$, where y_t is an estimate of energy capture rate per capita at time t , y_0 is the minimal energy requirement of an individual (2,500 kcal/day), and N_t is the population of the largest settlement at time t .

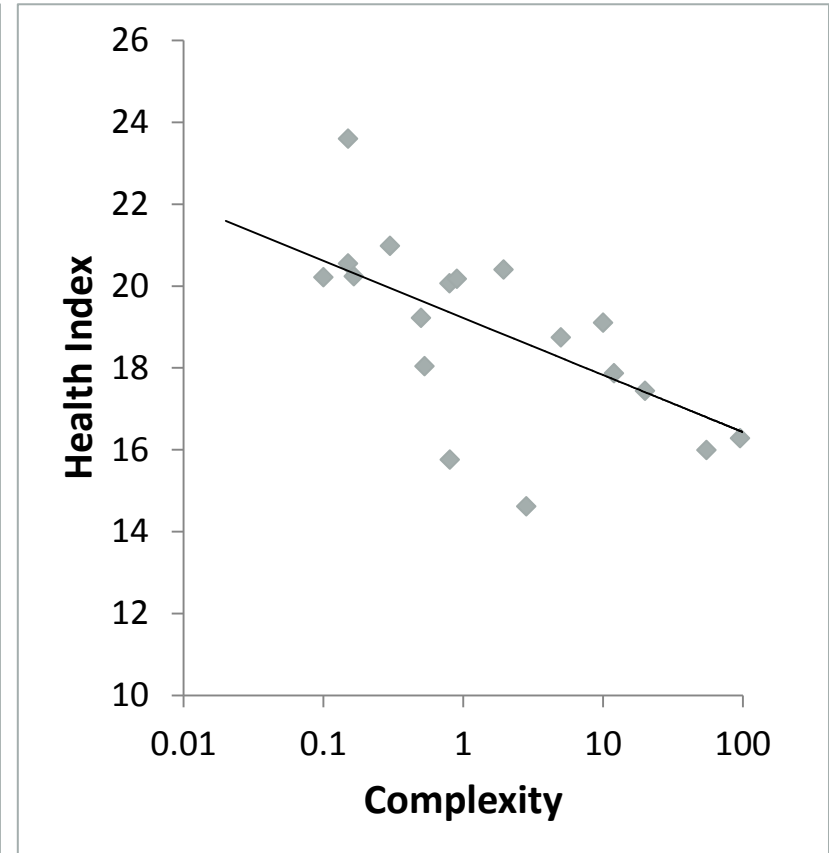
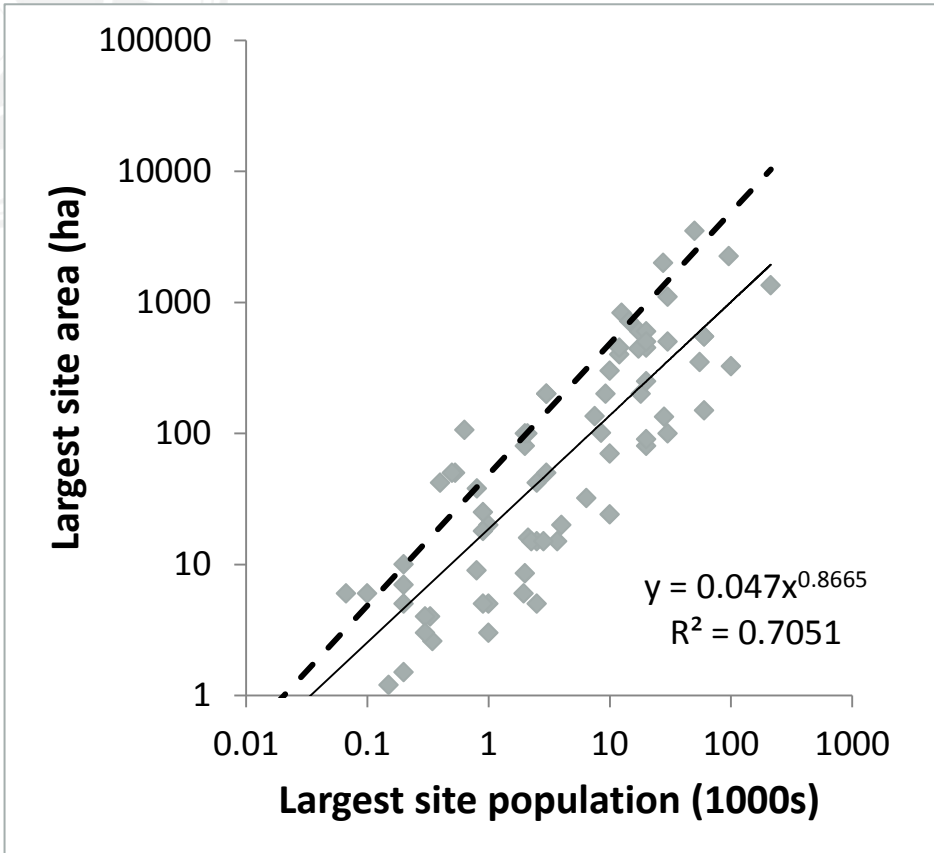
The expanding envelope of complexity



Not driven by environment or a specific innovation



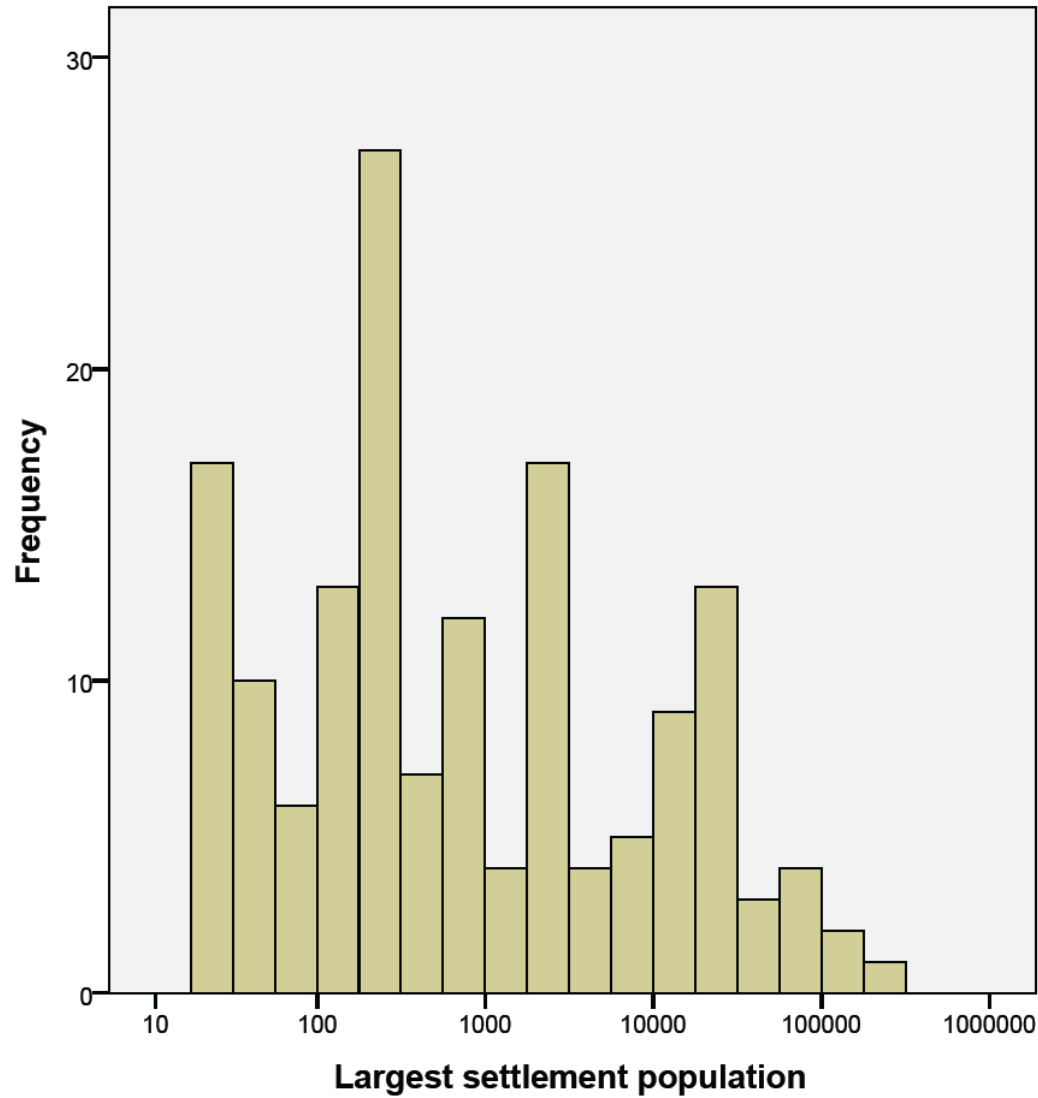
Group vs. individual benefits



An uneven process



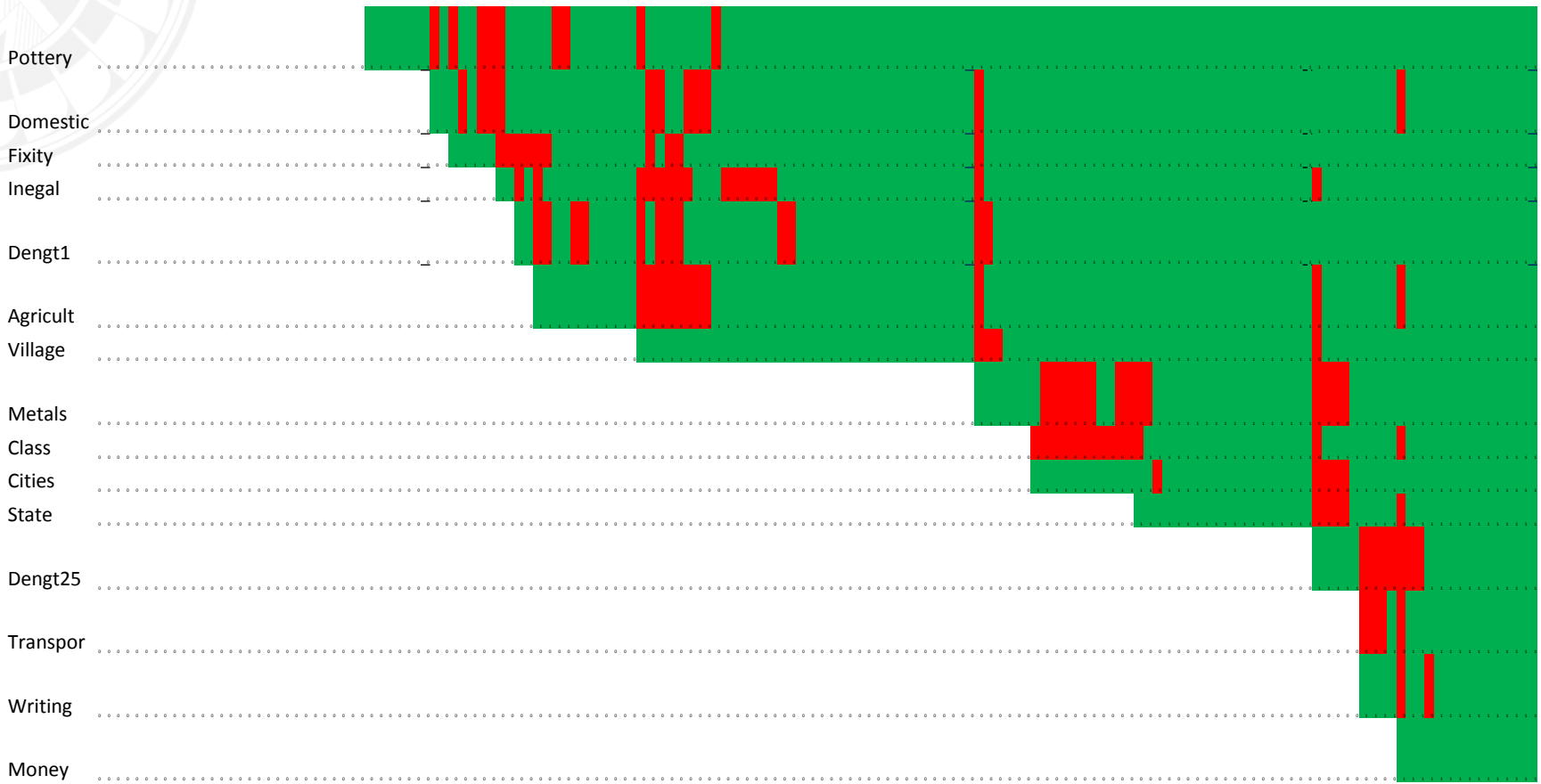
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A cumulative process



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The Nature of Social Complexity

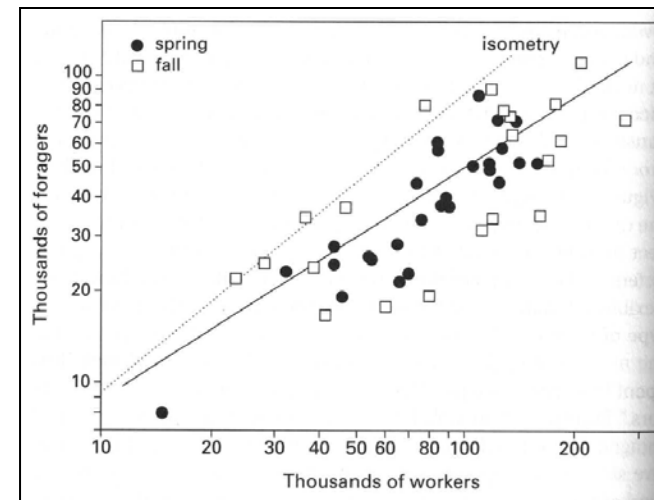
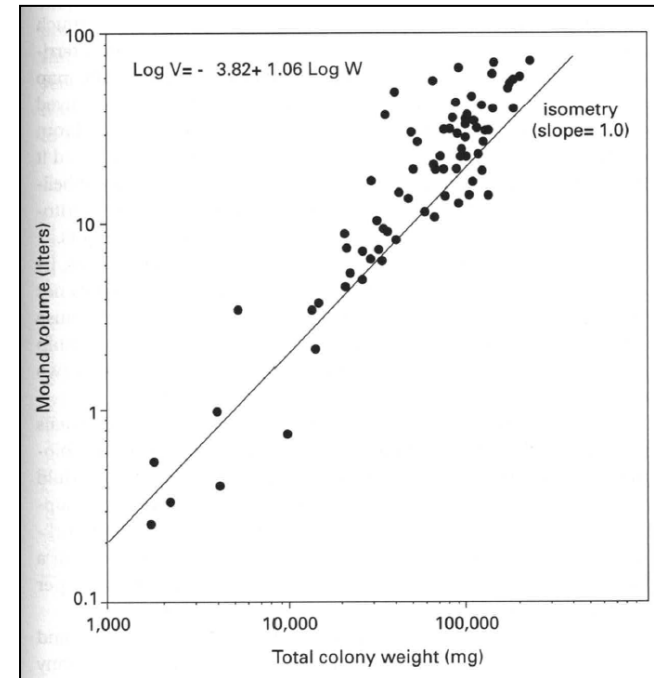


- Economies and returns to scale are intrinsic.
- They emerge from coordinated behavior (interaction and organization).
- Major transitions in social complexity involve rapid changes in the scale of coordination.
- Human societies involve the interplay of group and individual benefits (multi-level selection, collective action problems).
- Culture promotes social coordination, despite individual costs . . . BUT HOW EXACTLY?

Think about ants . . .



- Colonies illustrate economies of scale
- chemical signals (trails and antennae) induce hormonal changes that influence individual behavior
- workers are all siblings
- Genotypes that promote coordinated behavior spread despite individual costs



Patterns in early civilizations

- Many economic structures
- Two forms of political organization
 - city-states—farmers and elites in urban centers, market exchange
 - territorial states—urban elite, rural farmers, redistribution
- One set of religious ideas!
 - Humans : Natural forces :: Commoners : Rulers
 - Anthropomorphized forces of nature require material sacrifices to maintain the natural order
 - Elites require surpluses and labor to maintain the social order

The Social Psychology of “Religion”



- Social surveillance promotes cooperation
 - Supernatural monitoring has the same effect
 - Even among anonymous strangers
- Ideas influence in the moment
 - “Sunday effect”; priming studies (civic concepts also)
 - Religious situations matter more than religious persons
- Hell is stronger than heaven
 - Punishment a stronger deterrent than reward
- Credible sincere displays influence observers
- Emotion, intuition and prediction trump reason
- Adherence inspires trust in strangers
- Government does the same stuff (at greater cost)

Decomposing “Religion”

- Discourses—the actual ideas and their effects on individuals (more than Big Gods)
- Practices—group ritual, material symbols, displays of belief
- Communities—groups that share practices and discourses
- Institutions—people who regulate communities, practices and discourses

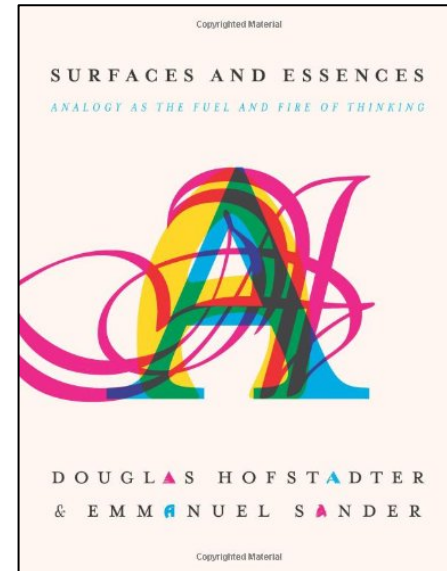
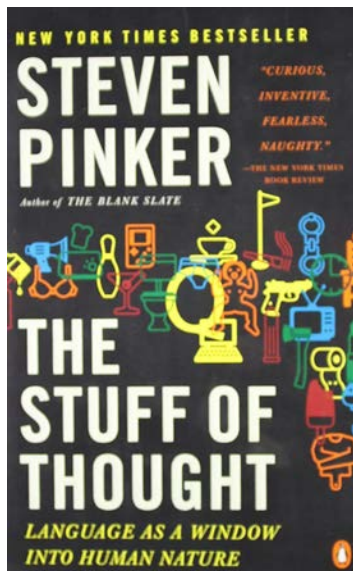
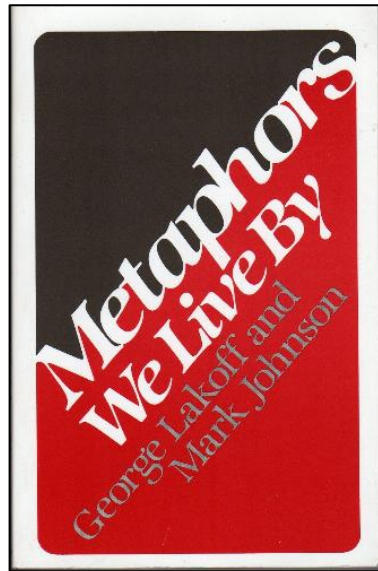
The Framework



1. Human nature is a mix of selfish and groupish (moral) instincts
 - care, fairness, loyalty, authority, sanctity
 - These are innately applied to kith and kin
 - Hamilton's rule applies at this scale
2. Thinking occurs through two processes
 - Fast—intuitive elephant
 - Slow—rational tail

3. Add figurative thought

The cultural genotype is a network of concepts and the concepts are metaphors: use of a concrete source domain to conceptualize and reason about an abstract target domain





4. Metaphors are chemical!

- Primary emotions: automatic body-state responses.
- Secondary emotions: images of body states associated with primary emotions.
- Secondary emotions are an element of overall bodily experience.
- Intuitive choice based on emotional correlates of bodily experience.
- Experiences, including secondary emotions, become source domains for metaphors.

5. Metaphors and social coordination



- Metaphors encourage the projection of all source domain imagery onto the target domain.
- Through somatic marking, metaphors encourage behavior consistent with emotional correlates of the source.
- Coordinated behavior emerges from individuals behaving in terms of the emotional correlates of social metaphors.
- Major transitions follow from conceptual innovations that influence this process.

Relationship to foundational thinkers (WMD²)



- More Weber – individual behavior is inflected by the specific ideas of culture
- Less Marx – all consciousness is “false” (costs and benefits vary with social scale, time scale, and values)
- More Durkheim – intuition, emotion, believing and belonging matter more than reason
- More Darwin – groupishness is an evolved trait

What about Hobbes?

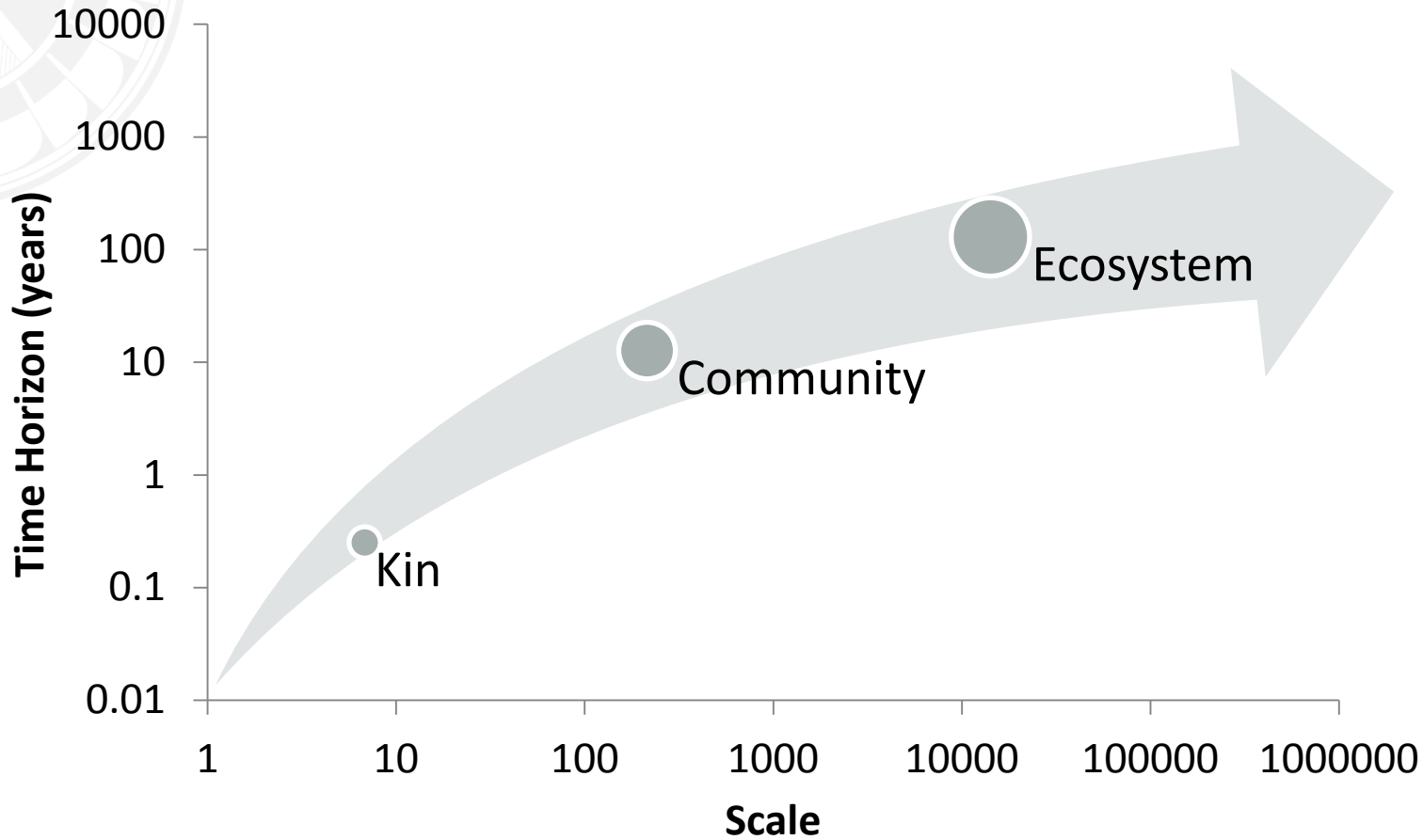
Collective Action Theory

- Rationality and self-interest work against cooperation due to free-riding
- People have goals that can include others' welfare
- Institutions provide services in exchange for resources
- Institutions promote trust and fairness, punish defectors

Conceptual Innovation Theory

- People are primarily emotional, intuitive beings that rationalize afterward
- Such goals are grounded in metaphors for large groups
- Moral commitment trumps rational calculation
- Social metaphors do this at lower cost—the first solution to governance

Evolution in human decision-making



Questions/Issues

- How to see this process?
- Is there a strong correlation?
- Is it really causal?
- When are people intuitive vs. rational?
- How strong is the influence?
- Specific semantic content? (FSM)
- Are there regularities in source domains?
- Is culture always needed?
- How to distinguish aggregate effects from other models?