



Predicting community Resilience

In a changing climate

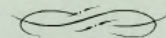
vst

josé palma-oliveira
universidade de lisboa

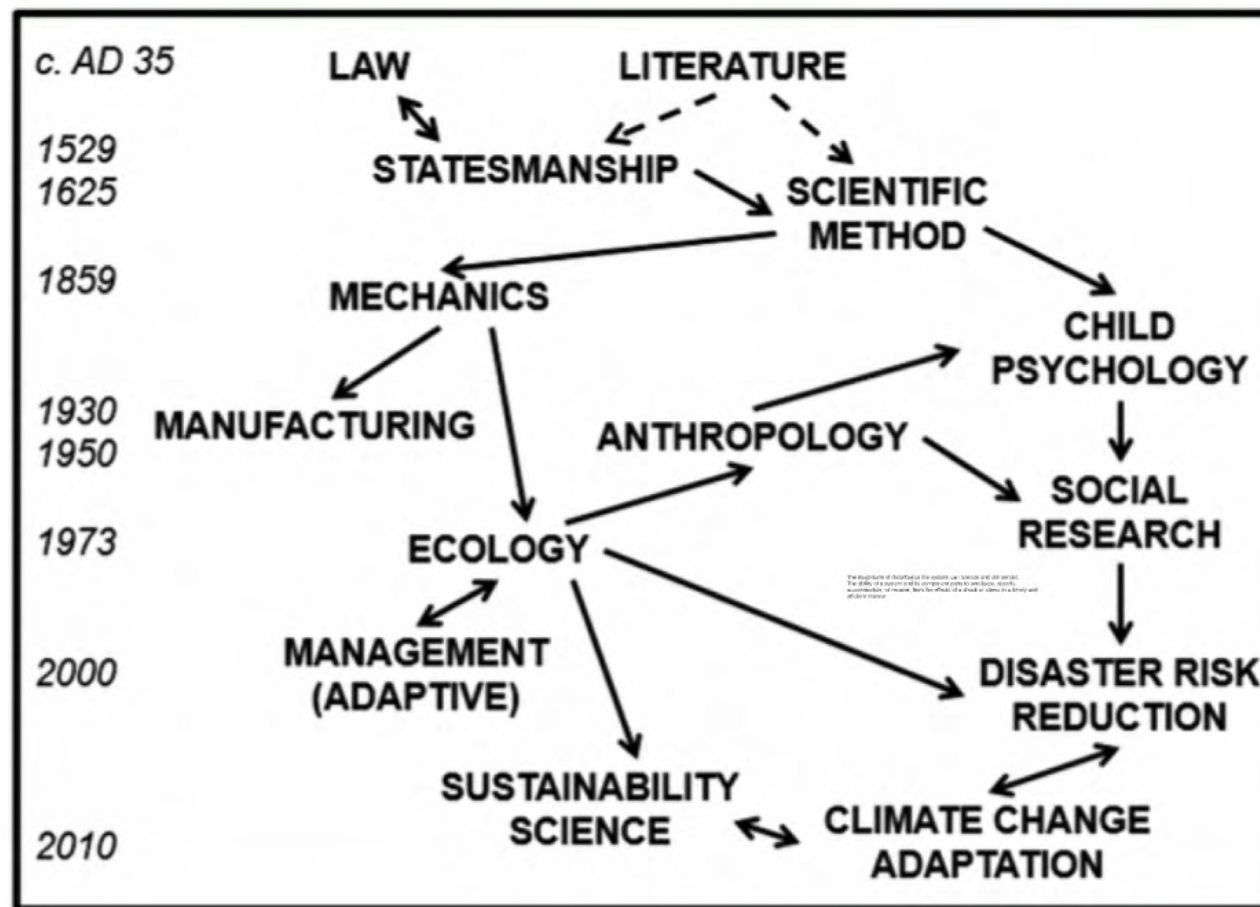


Predicting community Resilience

In a changing climate



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RE

The magnitude of disturbance the system can tolerate and still persist.
The ability of a system and its component parts to anticipate, absorb, accommodate, or recover, from the effects of a shock or stress in a timely and efficient manner

DISA

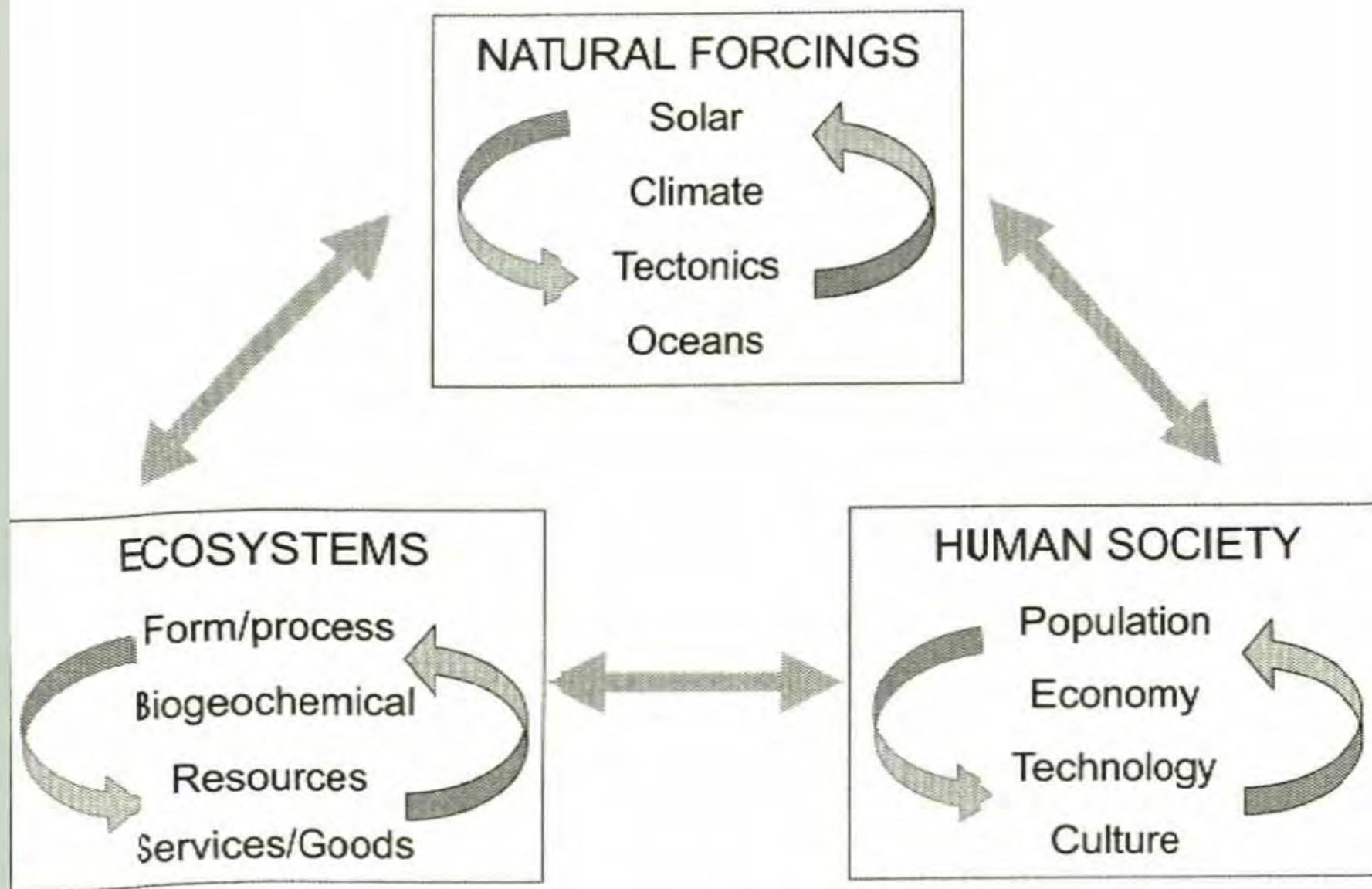
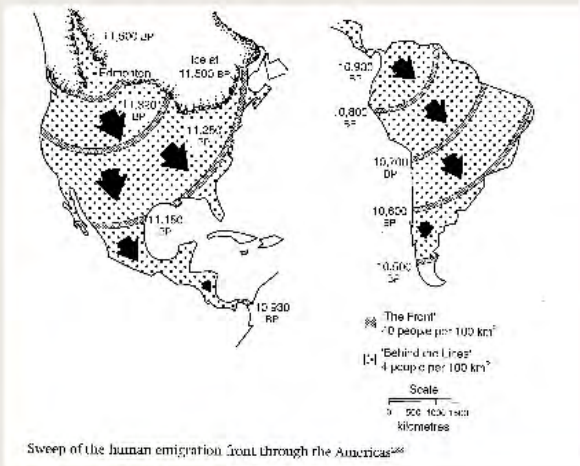
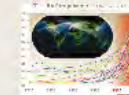


Figure 14.1 A schematic illustration of the potential interconnections between society, natural forcings, and ecosystems. Bi-directional arrows represent potential flows of energy, matter, and information between the three state systems that may define externally-driven causality and feedback. Circular arrows within each box represent internal dynamical processes (Dearing 2006).

changing the environment



$2,3 \times 10(9)$ ton / year of sediments
Less $1,4 \times 10(9)$ ton / year get to the oceans



ment



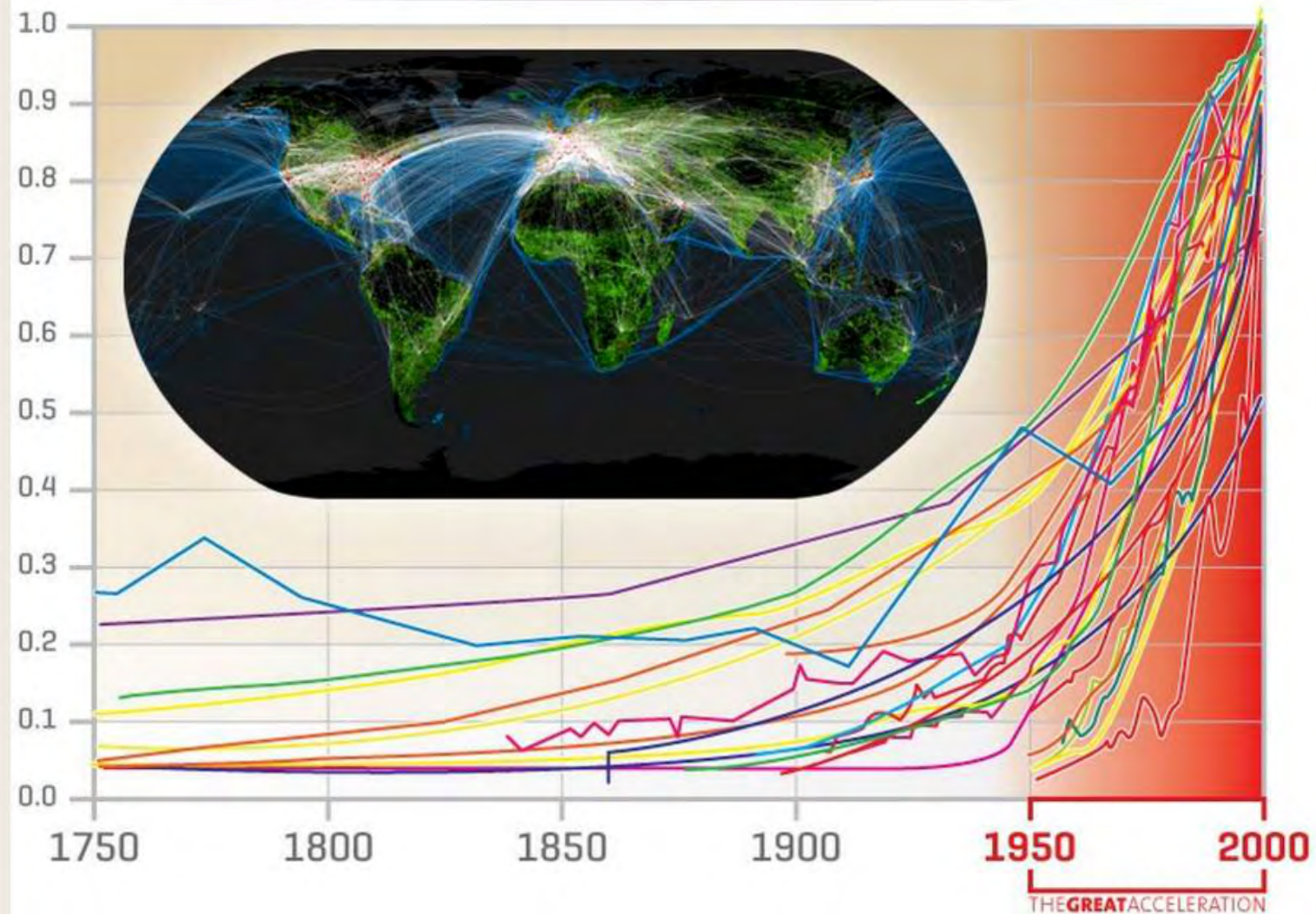
THE ANTHROPOCENE

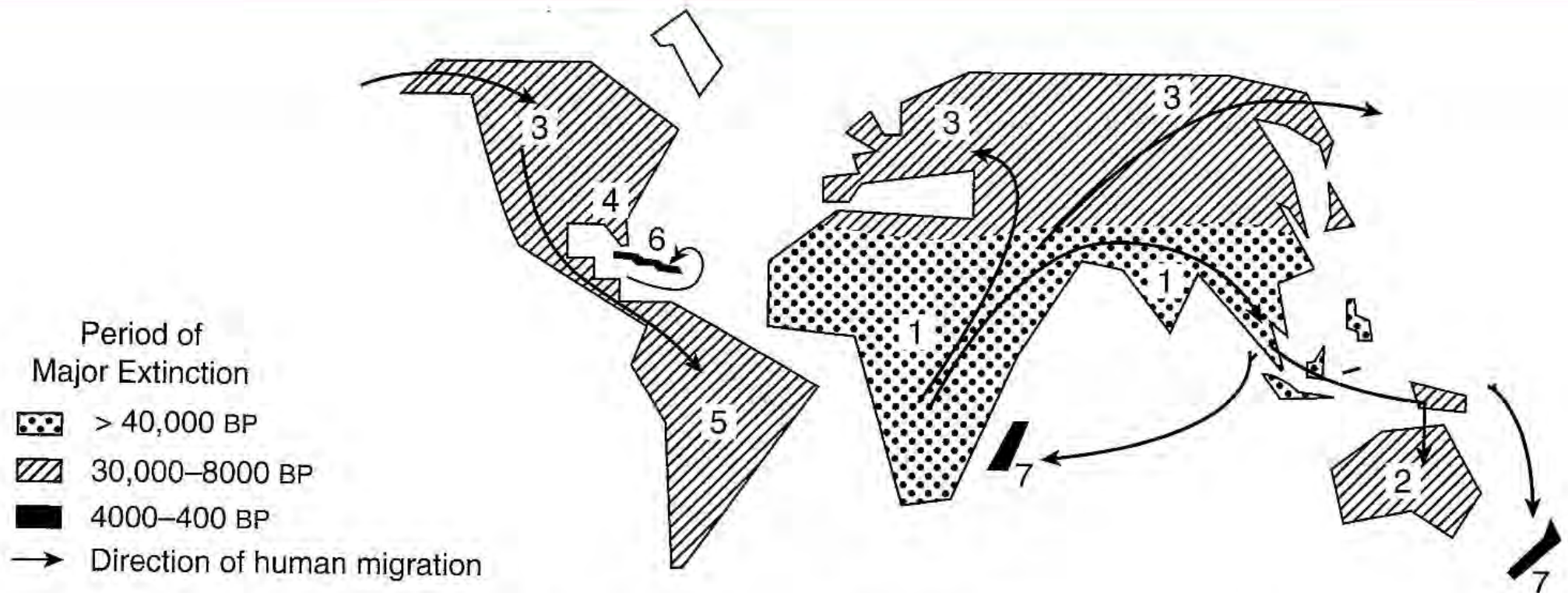
$2,3 \times 10^9$ ton / year of sediments

Less $1,4 \times 10^9$ ton / year get to the oceans

The **Anthropocene**

24 Indicators, 1 Chart



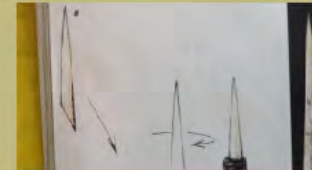


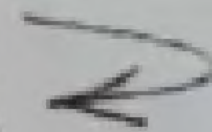
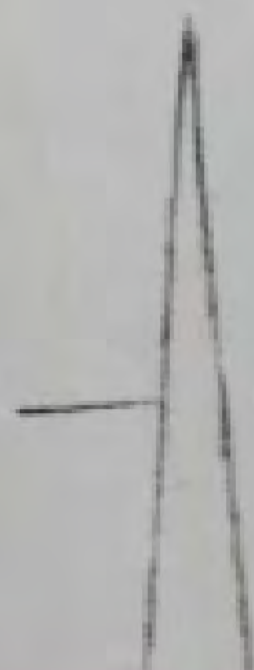
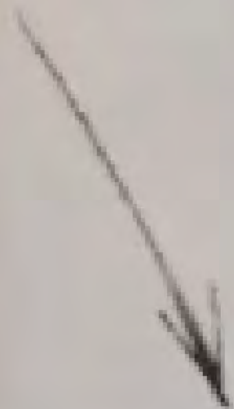
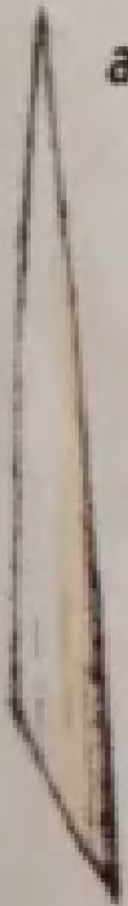
The global pattern of late-Pleistocene extinction in sequence: 1, Africa and Southern Eurasia; 2, New Guinea and Australia; 3, Northern Eurasia and northern North America; 4, Southeastern United States; 5, South America; 6, West Indies; 7, Madagascar and New Zealand. In each case, the major wave of late-Pleistocene extinction does not occur until prehistoric hunters arrive.²⁶⁵



adaptation "magdalénien"

-20 to -14







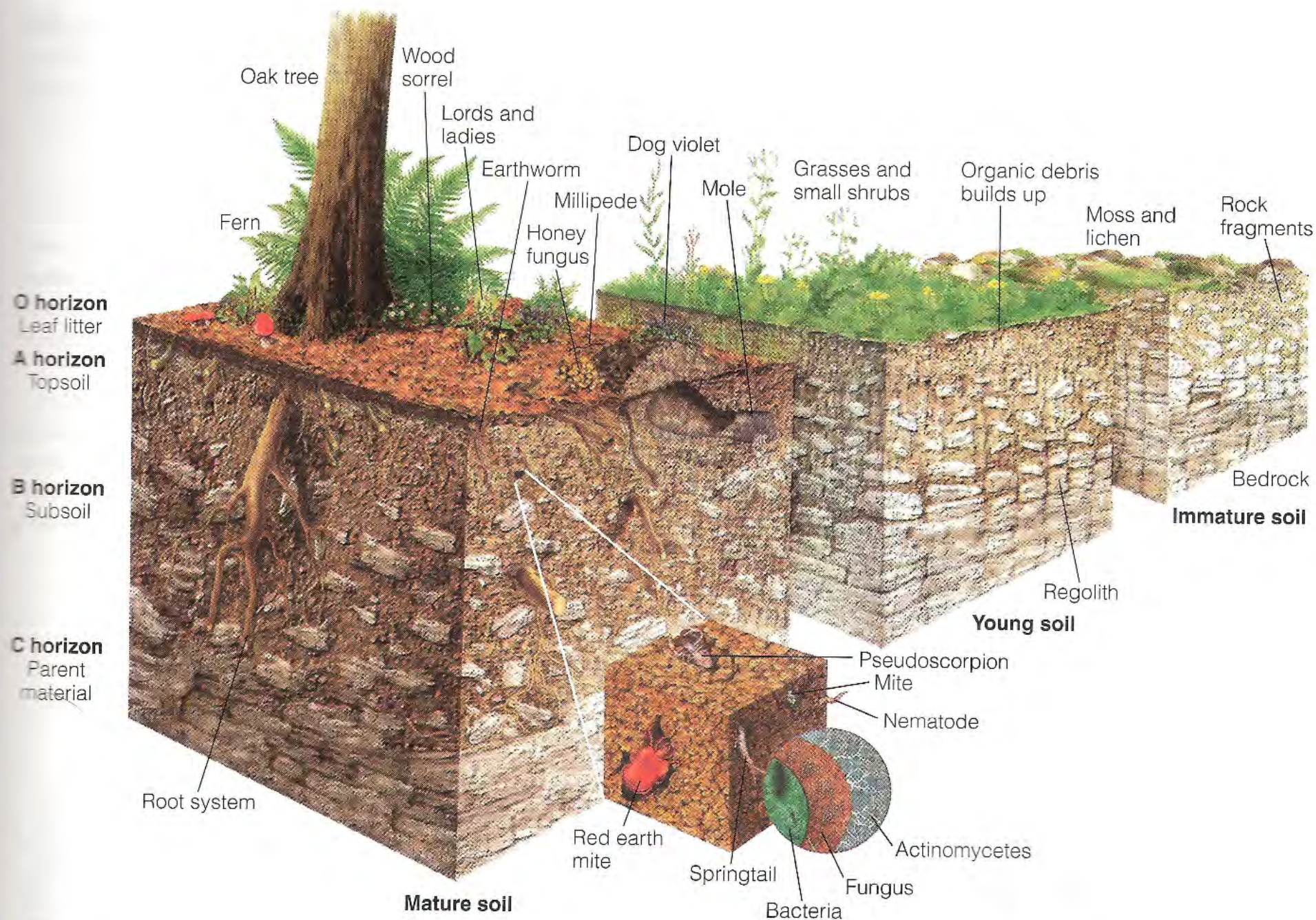
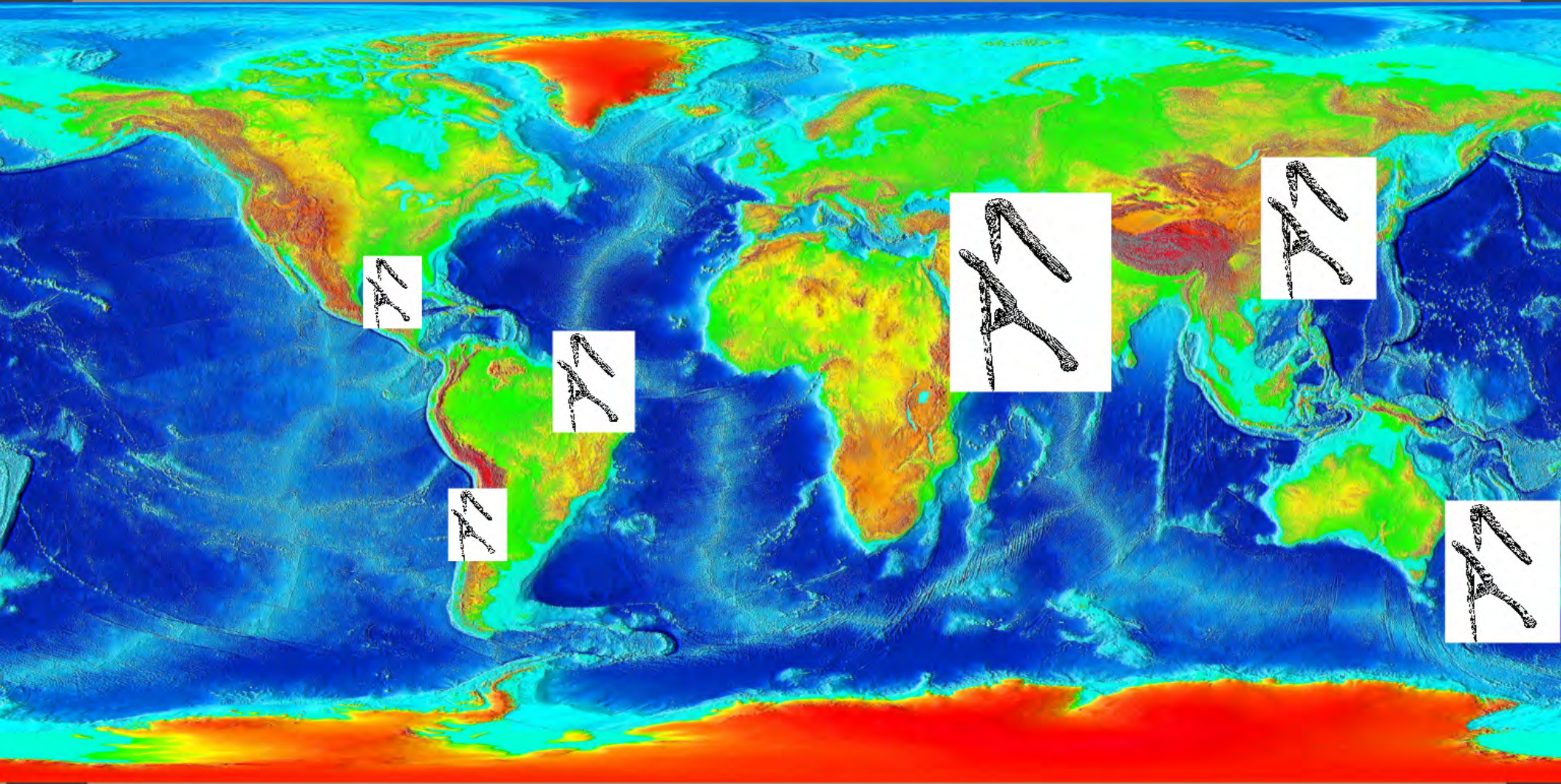


Figure 4-25 Natural capital: soil formation and generalized soil profile. Horizons, or layers, vary in number, composition, and thickness, depending on the type of soil. Soil is the base of life that provides the food you need to stay alive and healthy. (From Derek Elsom, *Earth*, 1992. Copyright © 1992 by Marshall Editions Developments Limited, New York: Macmillan. Used by permission.)



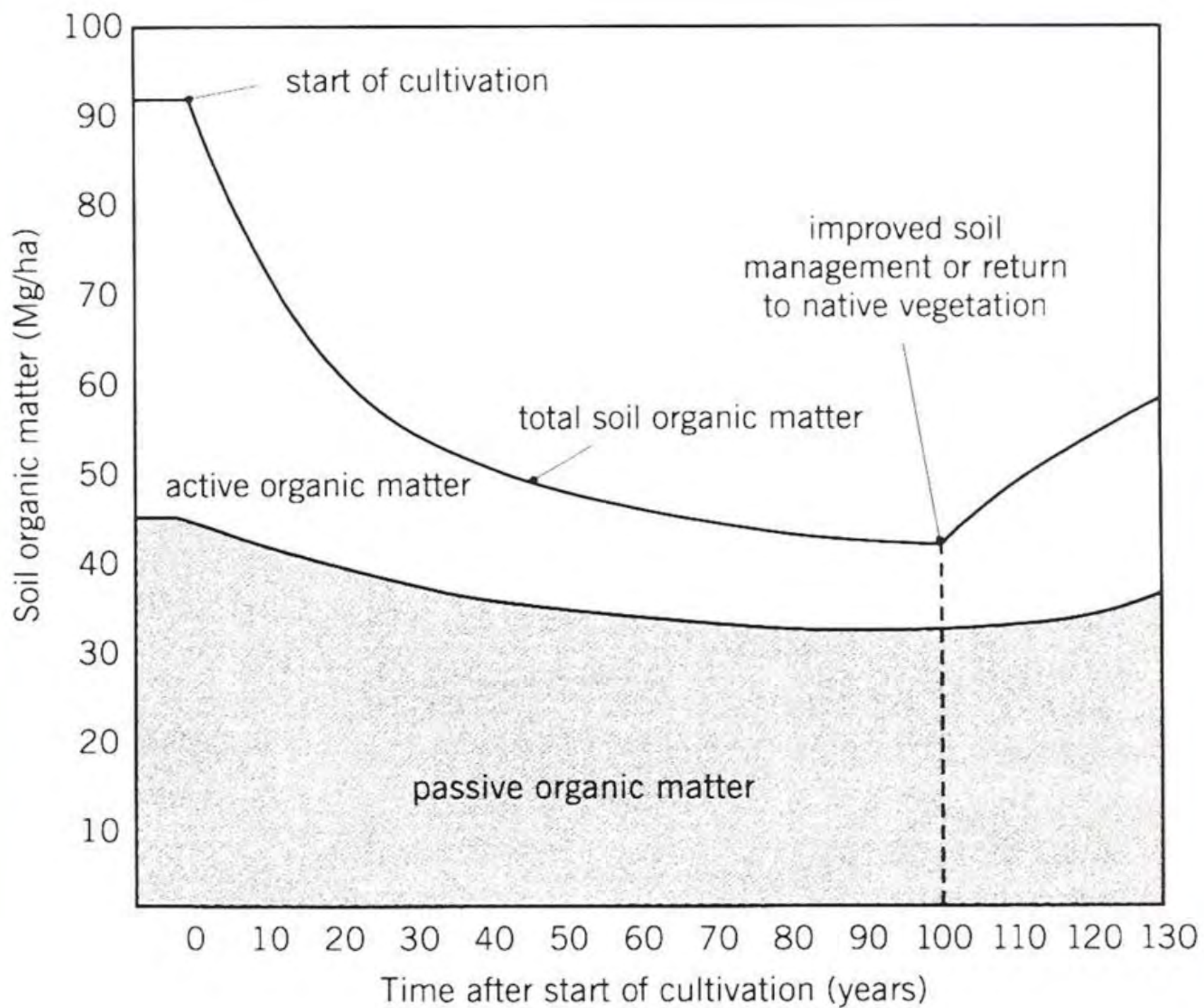
quase todas as áreas agrícolas iniciais foram destruídas





Entrance

Third-ranked Residents	Slaves	Third-ranked Residents
Lower-ranked Residents	Central Floor Space	Lower-ranked Residents
Second-ranked Resident	Top-ranked Resident	



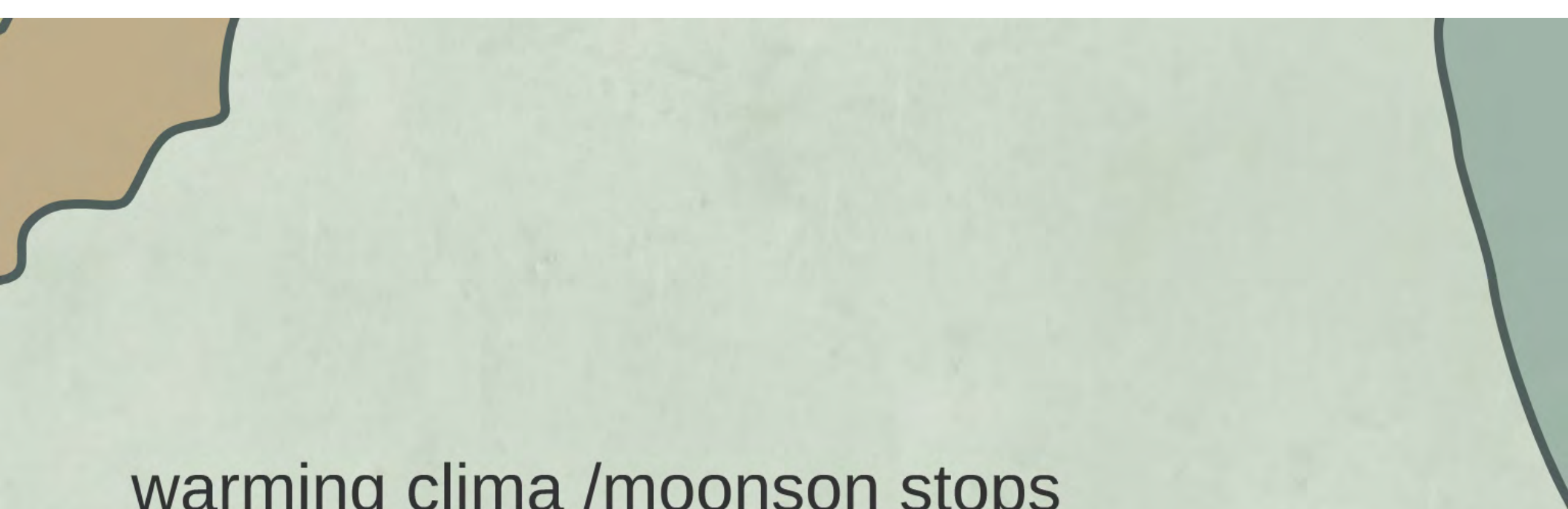


about 2000 (BC)

complex societies

huge amount of marginal areas changed/
destroyed

hunters gatherers expelled to marginal areas
environments more and more dependent of
human action



warming clima /moonson stops
almost all societies disrupted in a hard way
(indo-european invasions)
with some exceptions (last longer)



**Dancing girl
(Mohenjo Daro, ca. 2000 BC)**



The excav



**The excavated ruins of Mohenjo-daro in Sindh,
Pakistan, in 2010.**



Europa XIV:
1/3 a 25 milhões



Chaco Canyon



Central (maia) and South America



From 'collapse' to urban diaspora: the transformation of low-density, dispersed agrarian urbanism

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Abstract

In the tropical regions of southern Asia, Southeast Asia and the southern Maya lowlands, the management of water was crucial to the maintenance of political power and the distribution of communities in the landscape. Between the ninth and sixteenth centuries AD, however, this diverse range of medieval socio-political systems were destabilised by climatic change. Comparative study reveals that despite their diversity, the outcome for each society was the same: the breakdown of low-density urban centres in favour of compact communities in peripheral regions. The result of this, an 'urban diaspora', highlights the relationship between the control of water and power, but also reveals that the collapse of urban centres was a political phenomenon with society-wide repercussions.

John Evelyn - 1661, "Fumifugium; or the
Inconvenience of the Aer and Smoke of London
Dissipated; Some Remedies Humbly Proposed"



London Bridge in the XVIIth century

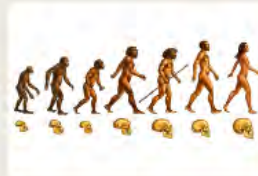
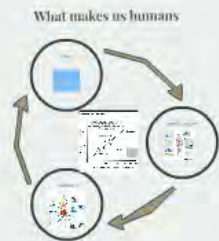


John Evelyn - 1661, "Fumifugium; or the
Inconvenience of the Aer and Smoke of London
Dissipated; Some Remedies Humbly Proposed"



YouTube

do we change???



stress



Stress is a response to a demand or challenge that is perceived as threatening or overwhelming. It is a complex process involving the brain, hormones, and the body's physical response. Stress can be acute or chronic, and it can have both positive and negative effects on health and well-being.

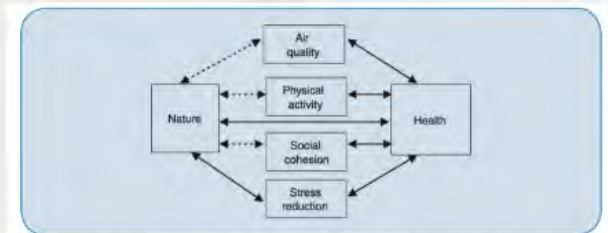
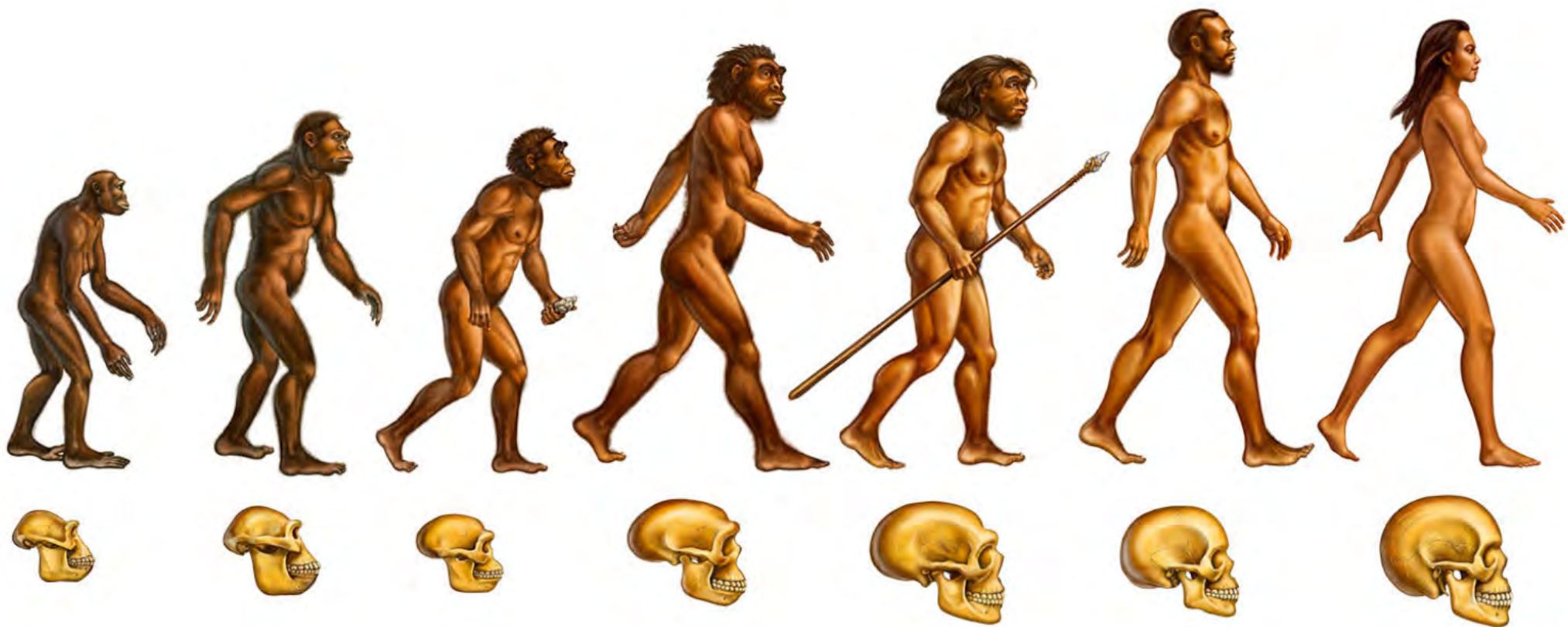
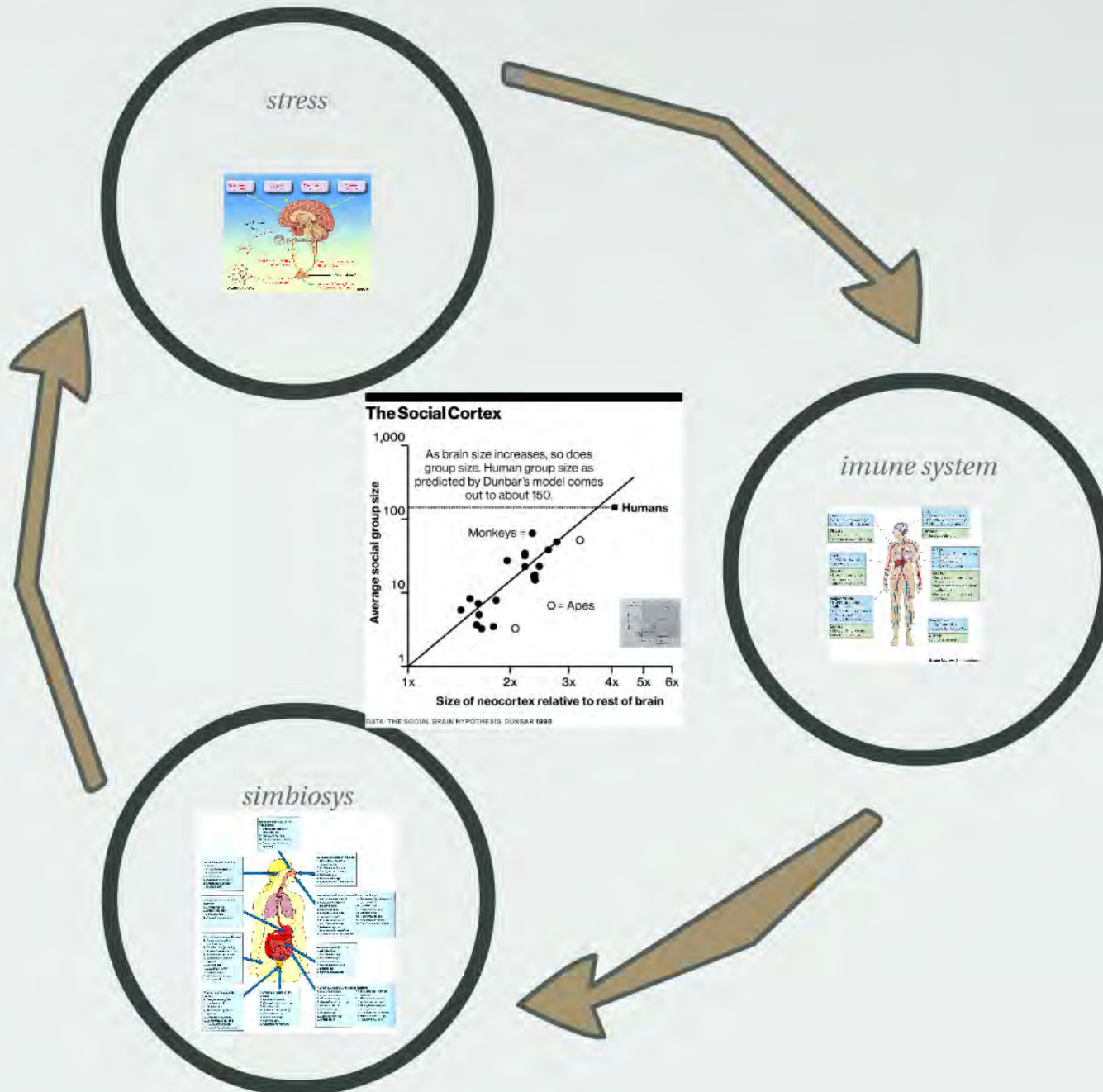


Figure 5.2 Schematic representation of relationships among nature, health, and underlying mechanisms. Solid lines represent established relationships; dashed lines represent weaker or inconsistent relationships.

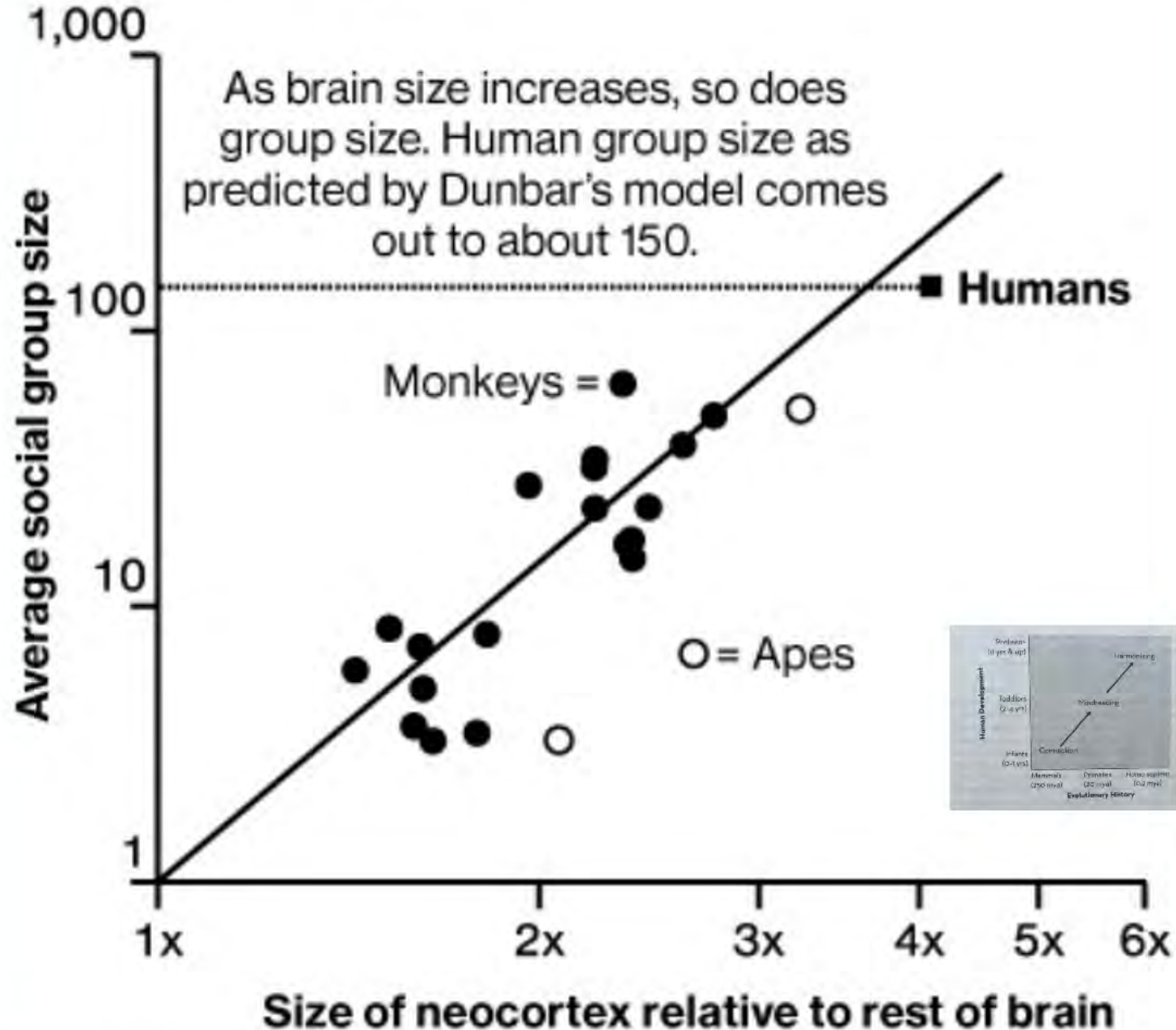




What makes us humans



The Social Cortex



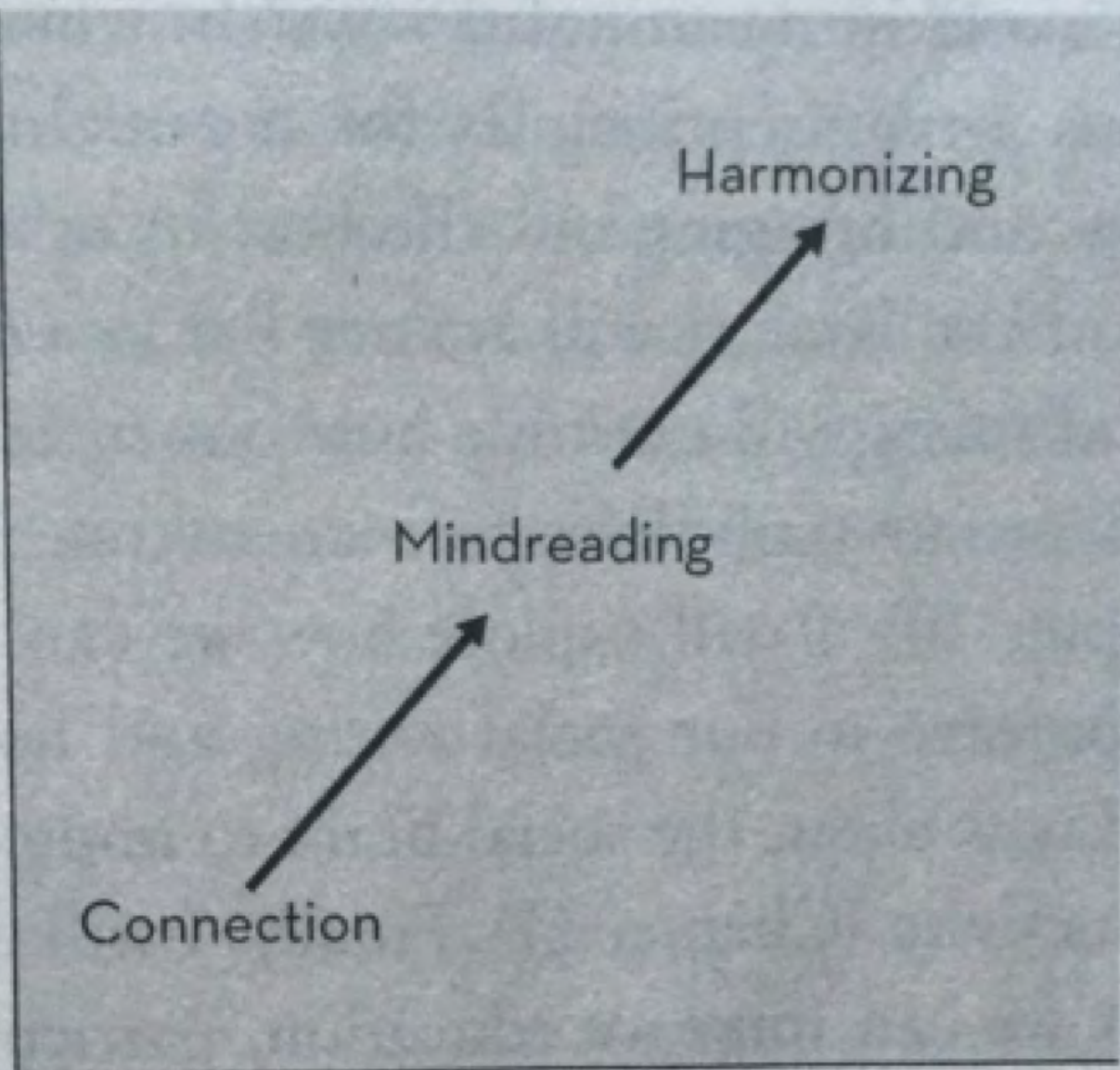
DATA: THE SOCIAL BRAIN HYPOTHESIS, DUNBAR 1998

Human Development

Preteen+
(11 yrs & up)

Toddlers
(2-4 yrs)

Infants
(0-1 yrs)



Mammals
(250 mya)

Primates
(20 mya)

Homo sapiens
(0.2 mya)

Evolutionary History

stress



Health problems reported as having appeared or aggravated since the contract ended, or began	% of persons	Correlation with stress measures (p < .05)
Tiredness	52	.76
Sleeping problems	52	.86
Respiratory problems	35	.64
Attention deficits	30	.73
Headaches	28	.62
Anxiety	18	.55

City living and urban upbringing affect neural social stress processing in humans

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Affiliations: Contributions / Corresponding Author

© 2006 Blackwell Publishing Ltd *Journal of Internal Medicine* 260: 459–467

Many more studies have been published in the last 10 years, and the results are generally consistent with the earlier studies. Children with better verbal skills are more likely to be reading at the age of 5, and children with better reading skills are more likely to be reading at the age of 10. The results also suggest that children with better reading skills are more likely to be reading at the age of 15. The results also suggest that children with better reading skills are more likely to be reading at the age of 20. The results also suggest that children with better reading skills are more likely to be reading at the age of 25. The results also suggest that children with better reading skills are more likely to be reading at the age of 30. The results also suggest that children with better reading skills are more likely to be reading at the age of 35. The results also suggest that children with better reading skills are more likely to be reading at the age of 40. The results also suggest that children with better reading skills are more likely to be reading at the age of 45. The results also suggest that children with better reading skills are more likely to be reading at the age of 50. The results also suggest that children with better reading skills are more likely to be reading at the age of 55. The results also suggest that children with better reading skills are more likely to be reading at the age of 60. The results also suggest that children with better reading skills are more likely to be reading at the age of 65. The results also suggest that children with better reading skills are more likely to be reading at the age of 70. The results also suggest that children with better reading skills are more likely to be reading at the age of 75. The results also suggest that children with better reading skills are more likely to be reading at the age of 80. The results also suggest that children with better reading skills are more likely to be reading at the age of 85. The results also suggest that children with better reading skills are more likely to be reading at the age of 90. The results also suggest that children with better reading skills are more likely to be reading at the age of 95. The results also suggest that children with better reading skills are more likely to be reading at the age of 100.

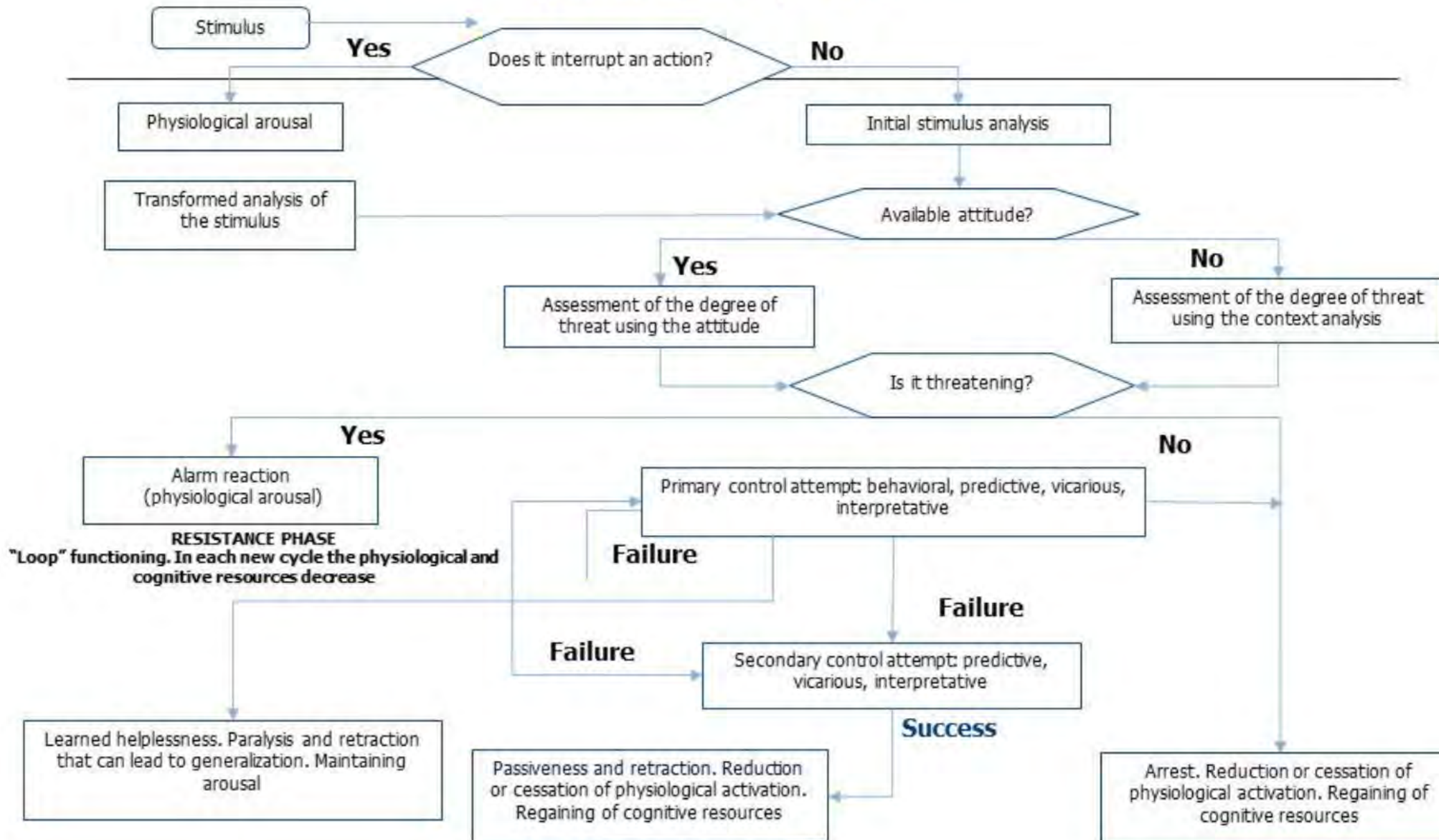


You**Tube**



Socio-Cognitive Model of Environmental Stress

(Palma-Oliveira, 1992)



Brain

Increased alertness and less perception of pain

Brain

Impaired memory and increased risk of depression

Thymus gland and other immune tissues

Immune system readied for possible injury

Thymus gland and other immune tissues

Deteriorated immune response

Circulatory system

Heart beats faster, and blood vessels constrict to bring more oxygen to muscles

Circulatory system

Elevated blood pressure and higher risk of cardiovascular disease

Adrenal glands

Secrete hormones that mobilize energy supplies

Adrenal glands

High hormone levels slow recovery from acute stress

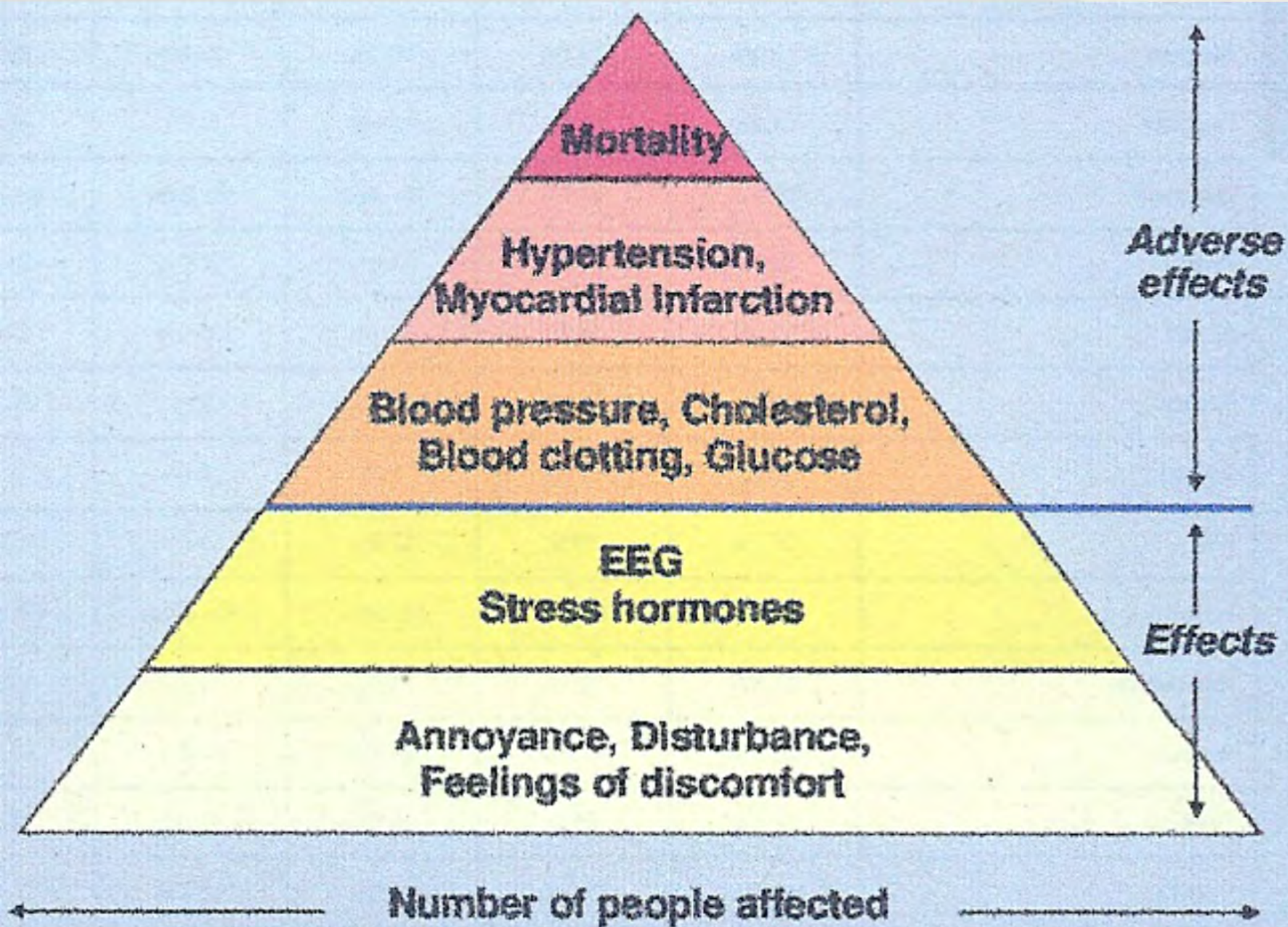
Reproductive organs

Reproductive functions are temporarily suppressed

Reproductive organs

Higher risk of infertility and miscarriage





(WHO, 1992 - modified)

Health problems reported as having appeared or aggravated since the construction/use began	% of persons	Correlation with distress measures (p<.05)
Fatigue	67	.46
Sleeping problems	67	.59
Breathing problems	63	.64
Attention deficits	60	.73
Headaches	53	.62
Allergies	50	.58

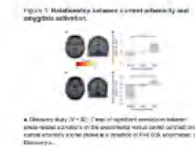
City living and urban upbringing affect neural social stress processing in humans

Florian Lederbogen, Peter Kirsch, Leila Haddad, Fabian Streit, Heike Tost, Philipp Schuch, Stefan Wüst, Jens C. Pruessner, Marcella Rietschel, Michael Deuschle & Andreas Meyer-Lindenberg

[Affiliations](#) | [Contributions](#) | [Corresponding author](#)

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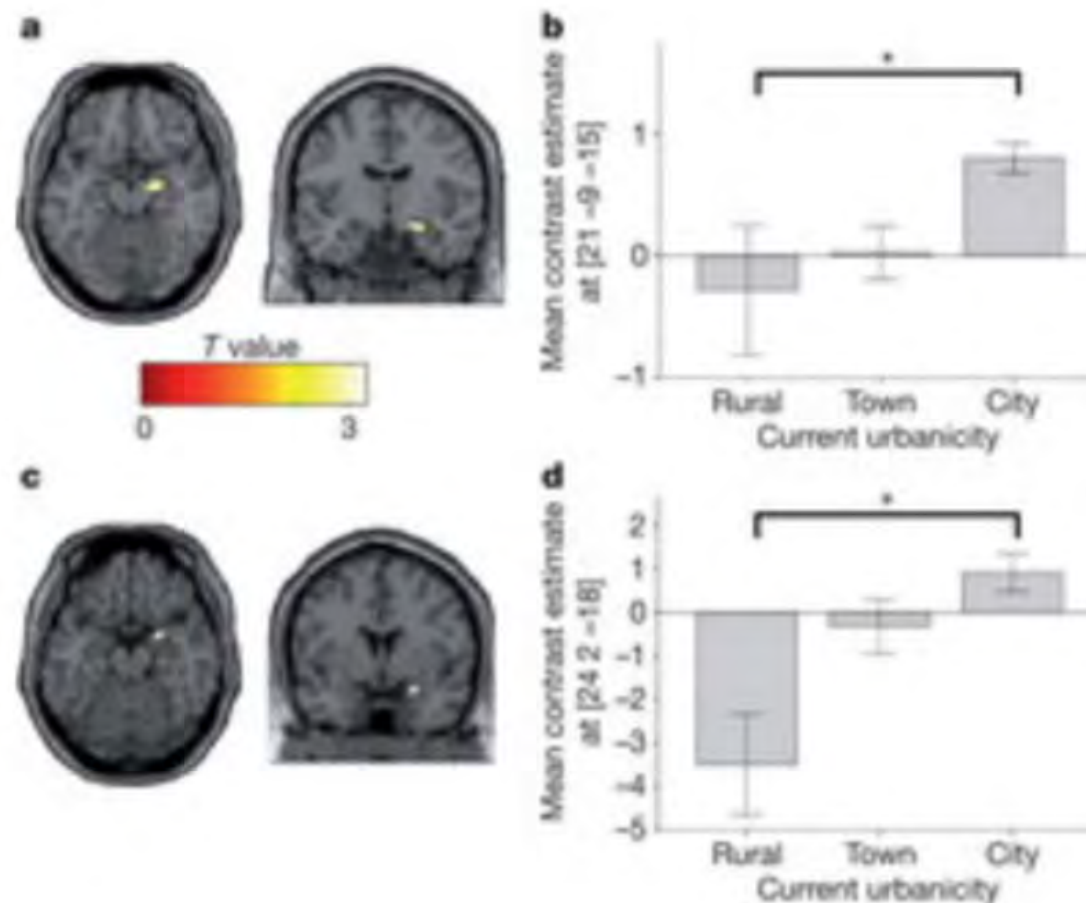
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More than half of the world's population now lives in cities, making the creation of a healthy urban environment a major policy priority¹. Cities have both health risks and benefits¹, but mental health is negatively affected: mood and anxiety disorders are more prevalent in city dwellers² and the incidence of schizophrenia is strongly increased in people born and raised in cities^{3, 4, 5, 6}. Although these findings have been widely attributed to the urban social environment^{2, 3, 7, 8}, the neural processes that could mediate such associations are unknown. Here we show, using functional magnetic resonance imaging in three independent experiments, that urban upbringing and city living have dissociable impacts on social evaluative stress processing in humans. Current city living was associated with increased amygdala activity, whereas urban upbringing affected the perigenual anterior cingulate cortex, a key region for regulation of amygdala activity, negative affect⁹ and stress¹⁰. These findings were regionally and behaviourally specific, as no other brain structures were affected and no urbanicity effect was seen during control experiments invoking cognitive processing without stress. Our results identify distinct neural mechanisms for an established environmental risk factor, link the urban environment for the first time to social stress processing, suggest that brain regions differ in vulnerability to this risk factor across the lifespan, and indicate that experimental interrogation of epidemiological associations is a promising strategy in social neuroscience.

Figure 1: Relationship between current urbanicity and amygdala activation.



a, Discovery study ($N = 32$): T map of significant correlations between stress-related activations (in the experimental versus control contrast) and current urbanicity scores shown at a threshold of $P < 0.005$, uncorrected. **b**, Discovery s...

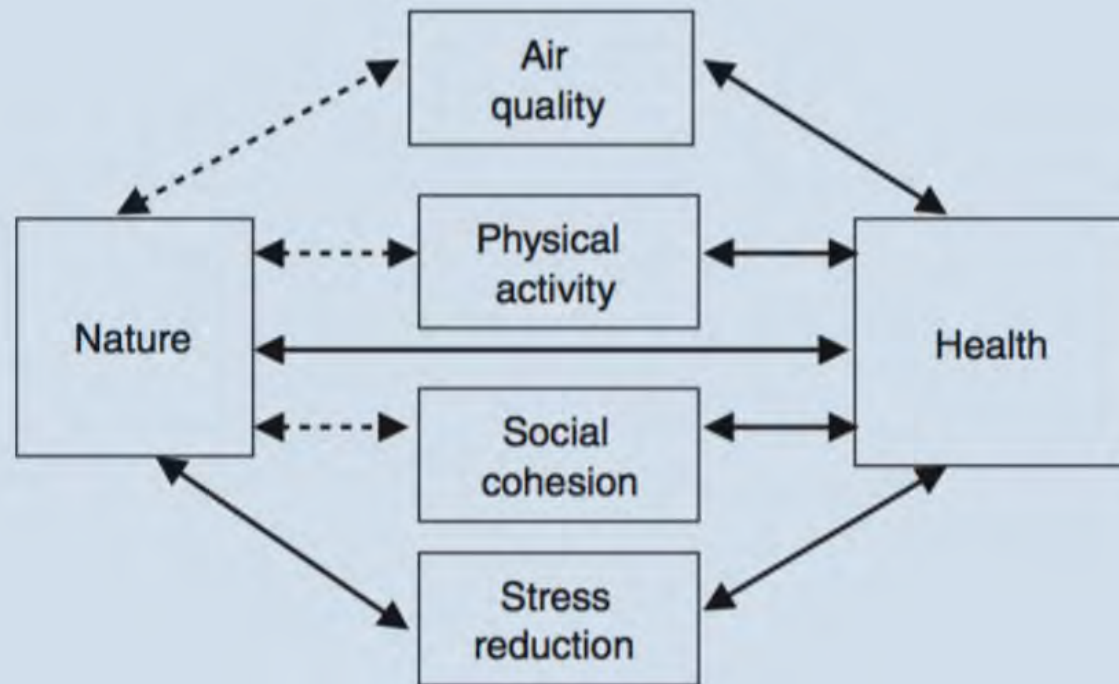


Figure 5.2 Schematic representation of relationships among nature, health, and underlying mechanisms. Solid lines represent established relationships; dashed lines represent weaker or inconsistent relationships.

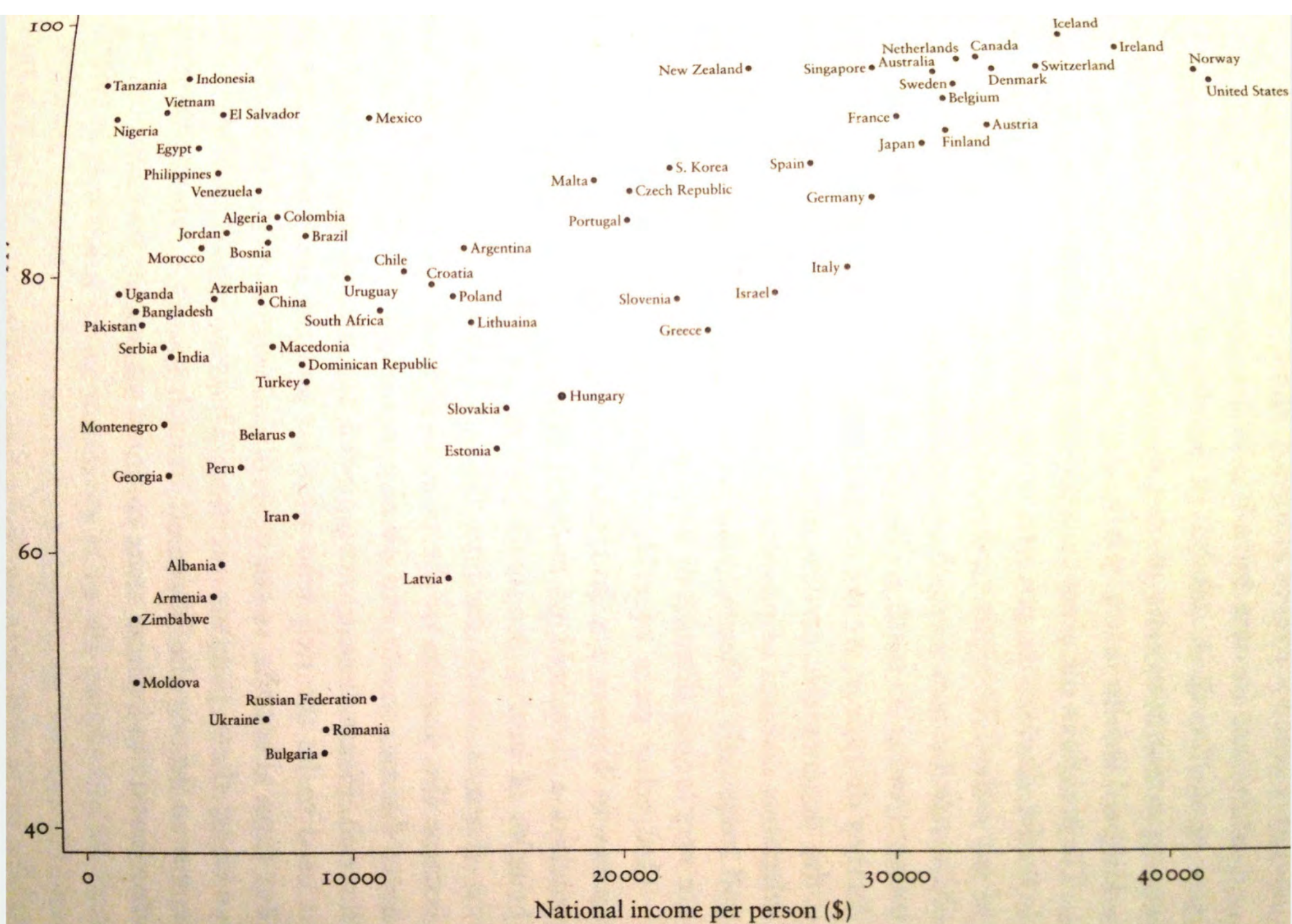
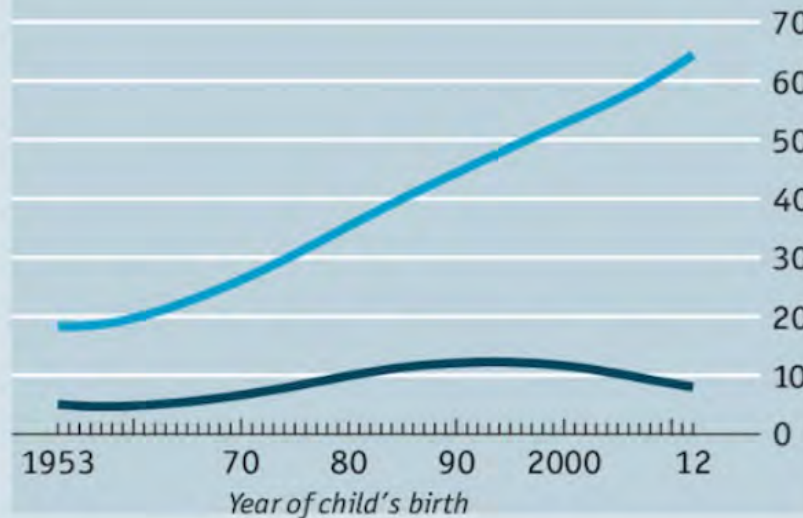


Figure 1.2 *Happiness and average incomes (data for UK unavailable).⁵*

The new class divide

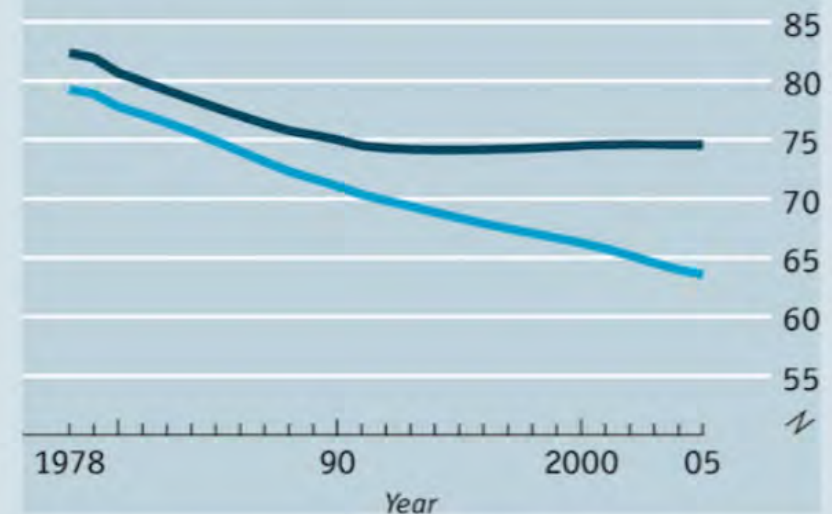
United States

Children aged 0-7 living in a single-parent family
%



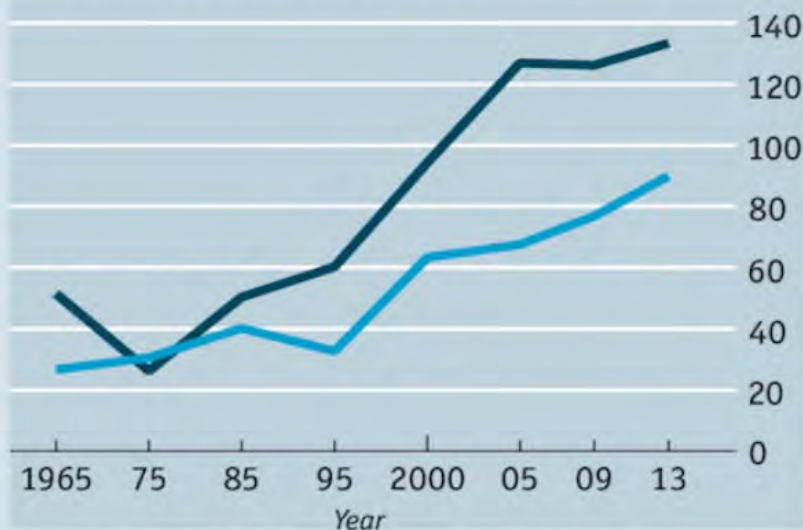
Parents with bachelor's degree or better
Parents with no more than high-school education

"Our whole family usually eats dinner together"
% agreeing



Time spent by both parents in developmental
child care

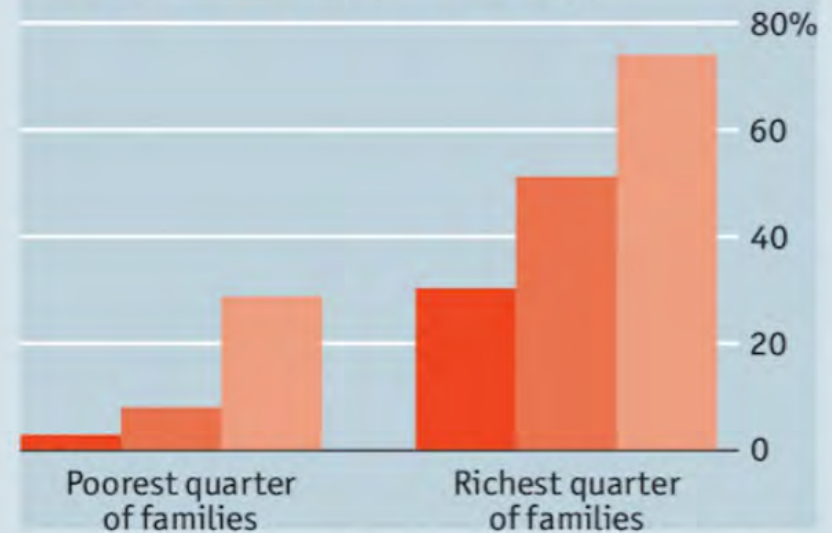
Children aged 0-4, minutes per day



Likelihood of graduating from college*

Child's middle-school (8th grade) test scores:

Low Middle High



Source: "Our Kids", Robert Putnam

*College graduation 2000, test scores 1988

Share of young people aged 25-34 living with parents

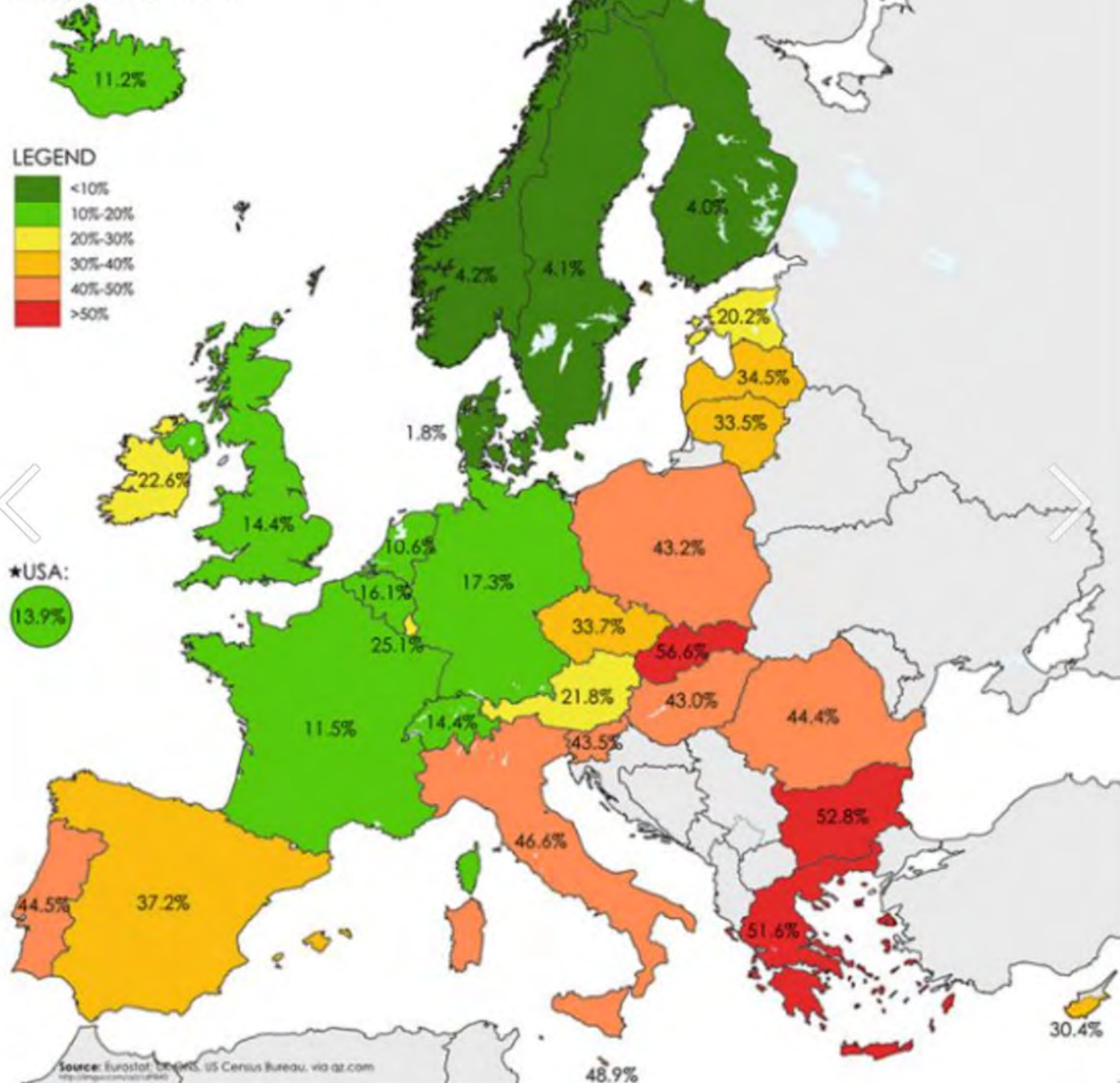


Table 6.2

Partial effect of democracy on happiness in 28 countries, 1988–1998. Dependent variable: happiness [1–4]. Ordered probit estimate. Numbers in parentheses are the absolute value of the z statistics of the estimated parameters. Significance levels: * $0.01 < p < 0.05$. Source: Dorn et al. 2007; based on 1998 International Social Survey Program and Polity IV Index.

Democracy in 1988 ^a	0.068* (2.54)
Change in democracy ^a 1988–1998	0.051* (2.06)
Control variables ^b	Yes
Number of observations	25,937

a. Democracy measured by Polity IV Index.

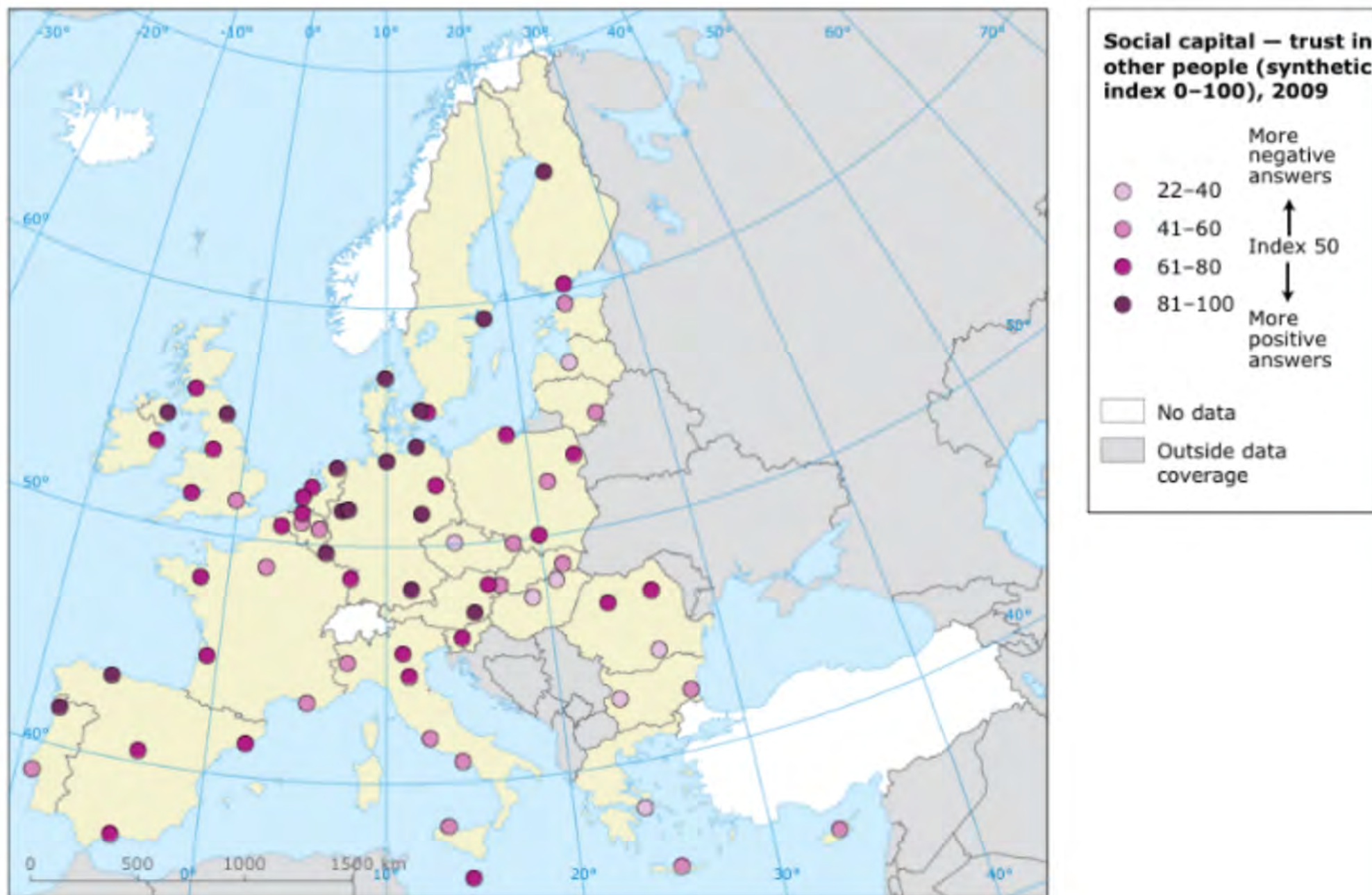
b. Control variables include age, gender, education, household size, marital status, employment status, subsistence income, relative income, income above or below poverty line, culture (language), and religion.

e 7.1

atisfaction and self-employment in West Germany (1984–2000), Great Britain (1991–, and Switzerland (1999). Dependent variable: job satisfaction [scales: West Germany Great Britain 1–7, Switzerland 0–10]. Ordered logit regressions with robust standard s (clustered for individuals). Standard errors in parentheses. Significance levels: 0.01. Source: Benz and Frey 2008a; based on German Socio-Economic Panel, British ehold Panel, and Swiss Household Panel.

	West Germany	Great Britain	Switzerland
mployed	0.196** (0.064)	0.278** (0.056)	0.418** (0.112)
oyed	Reference group	Reference group	Reference group
ol variables ^a	Yes	Yes	Yes
ummies	Yes	Yes	No
f observations	70,229	52,022	3,431
f individuals	11,700	13,380	3,431
ue	5.85**	13.84**	3.38**

Map 3.9 Social capital — trust in other people (synthetic index 0–100), 2009




Source: DG REGIO/Eurostat: Urban Perception survey 2010; data 2009.



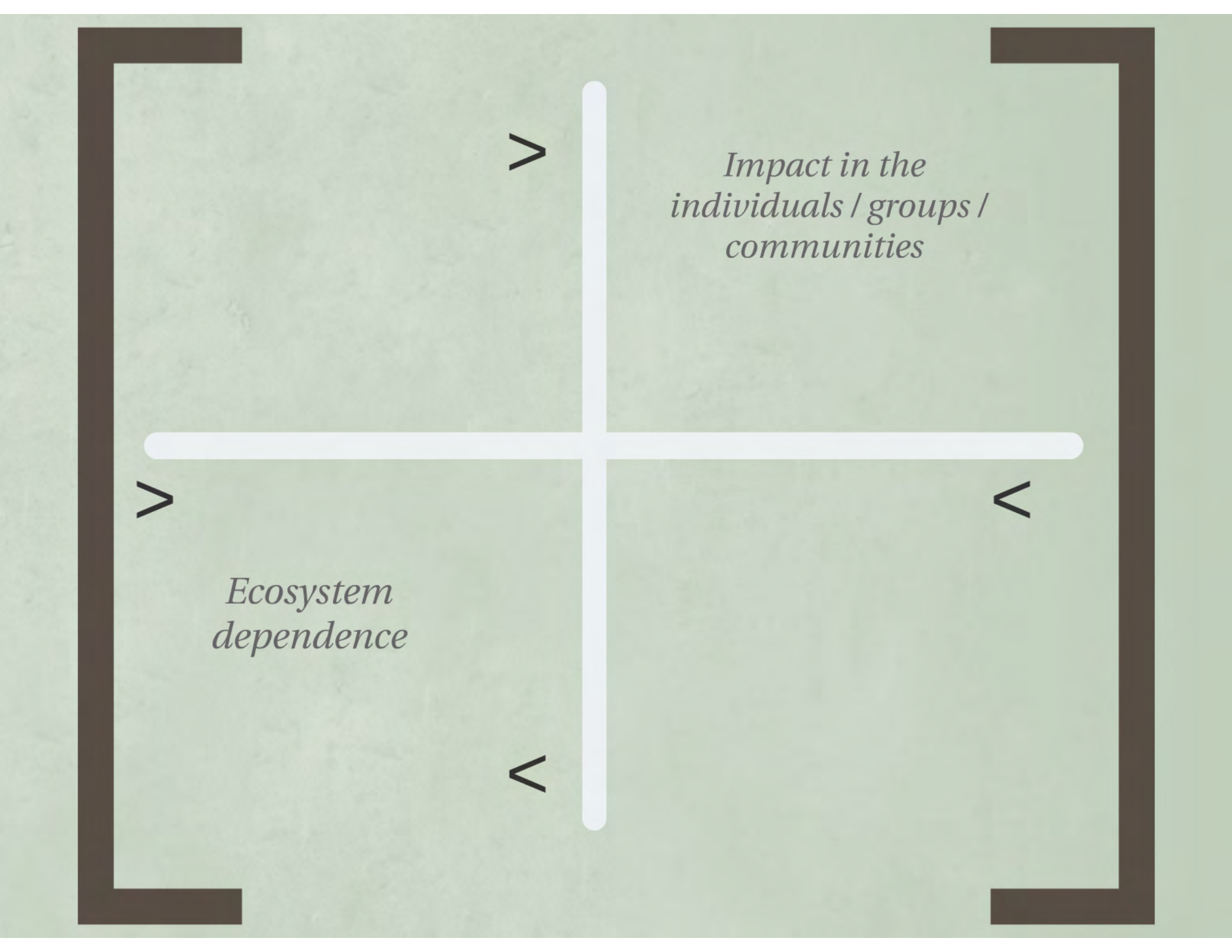
<biodiversity
> specification
> levels of infrastructure

> *Ecosystem
dependence* <



*Impact in the
individuals / groups /
communities*

< control
> chronic stress
> perceived inequity



*Impact in the
individuals / groups /
communities*

*Ecosystem
dependence*

