

CITIES, HEALTH AND WELL-BEING

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Stress and the City



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Stress and the city

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Definition of Stress

Stress is an unspecific physical and psychological reaction of the organism to a psychological challenge (Mason, 1968).

WHO has declared stress as one of the major health challenges of the 21st century.



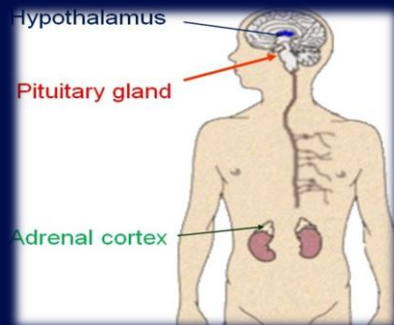
Modulators of the stress response



personality traits



life events



neuroendocrine systems



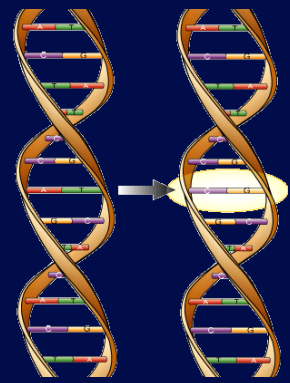
prenatal influences



childhood

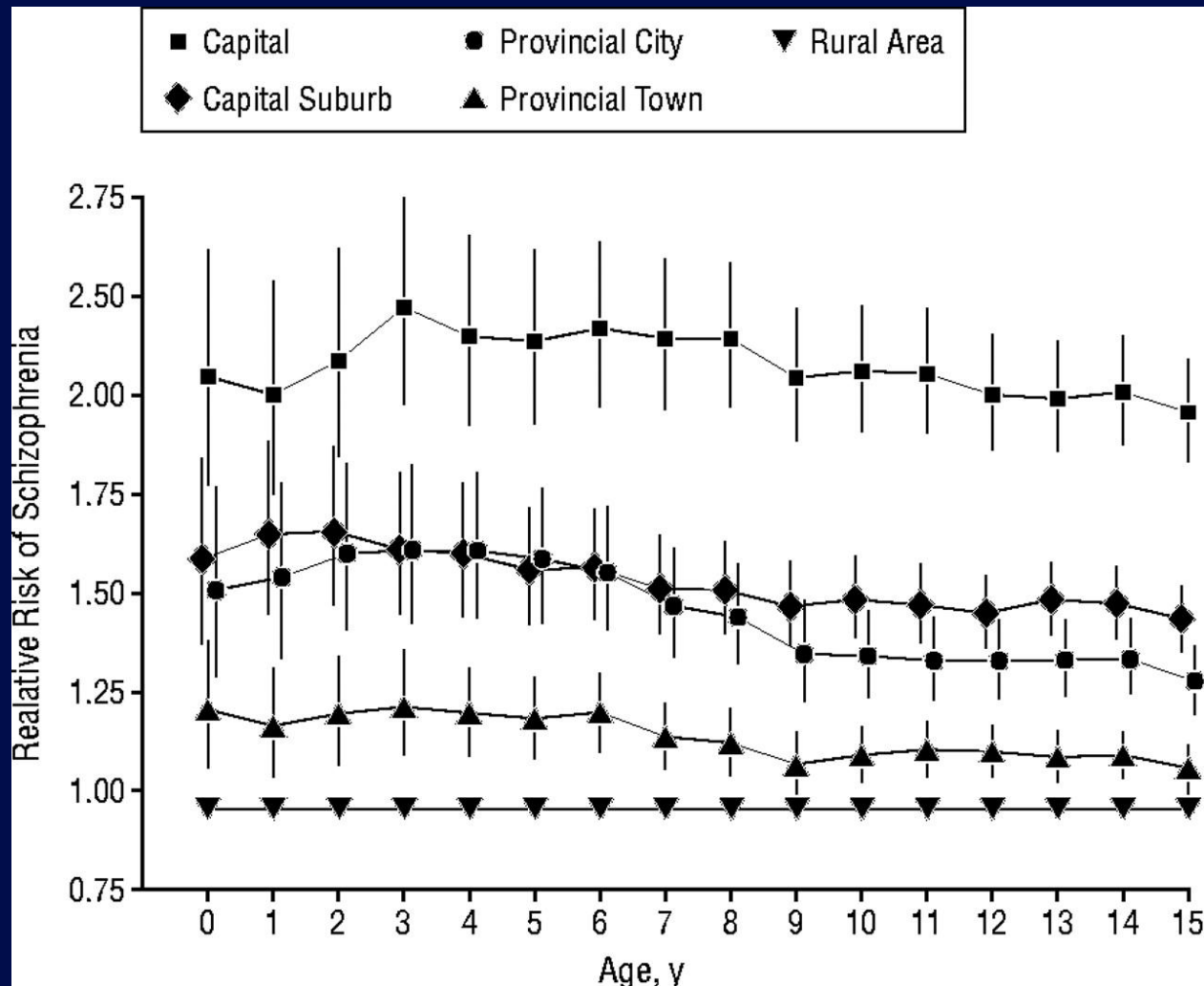


urbanicity



genes

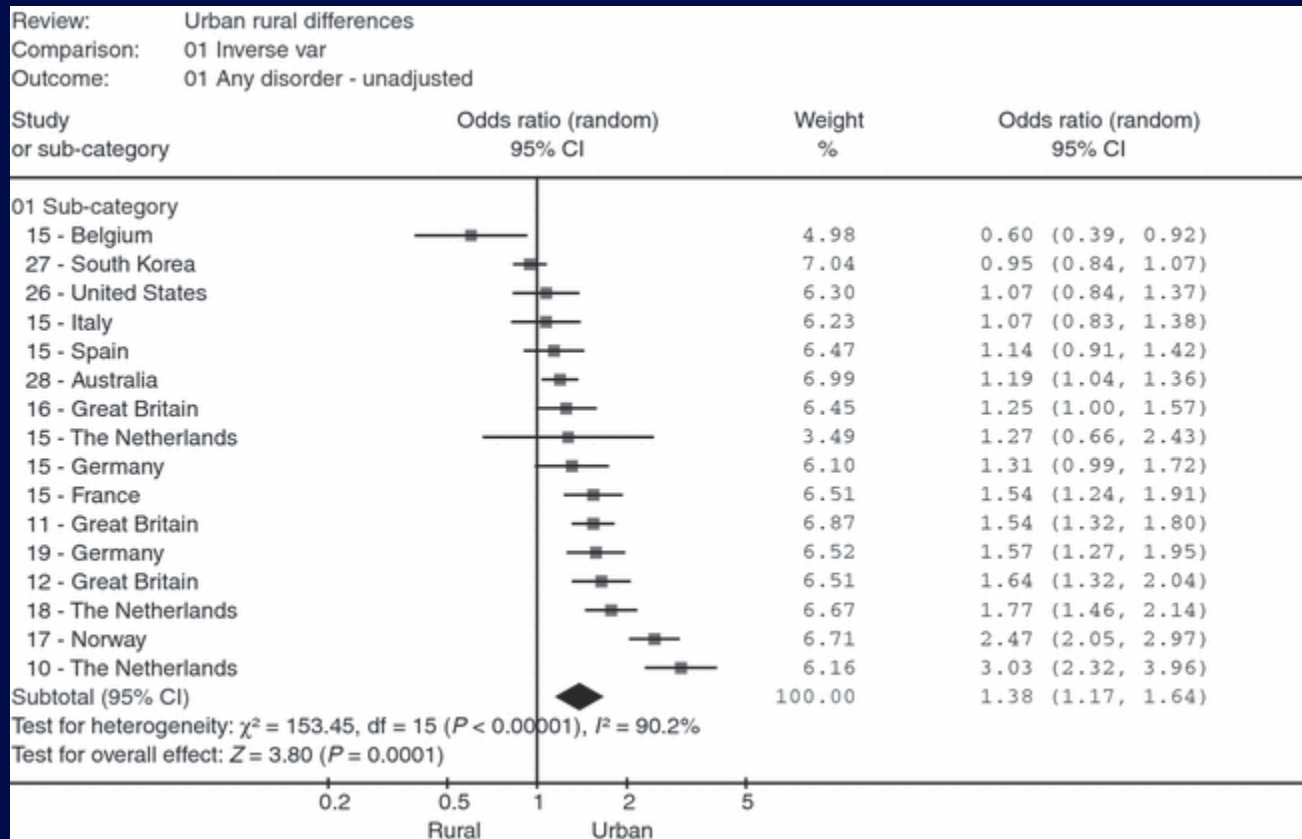
Relative risk of schizophrenia according to urbanicity and age at residence



27.1 mio person years of follow-up

Pedersen et al. 2001, Arch Gen Psychiatry

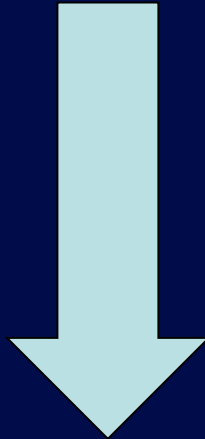
The current status of urban-rural differences in psychiatric disorders



Risk difference urban vs. rural
mood disorders 39%
anxiety disorders 21%

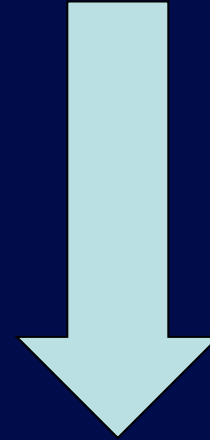
Peen et al. 2010, Acta Psychiatr Scand

CAUSATION HYPOTHESIS



urban environment
causes mental-ill health

SELECTION HYPOTHESIS



High-risk
individuals move
into urban areas

Stress in the city: social stress



Social
density

+

Social
isolation



social
stress



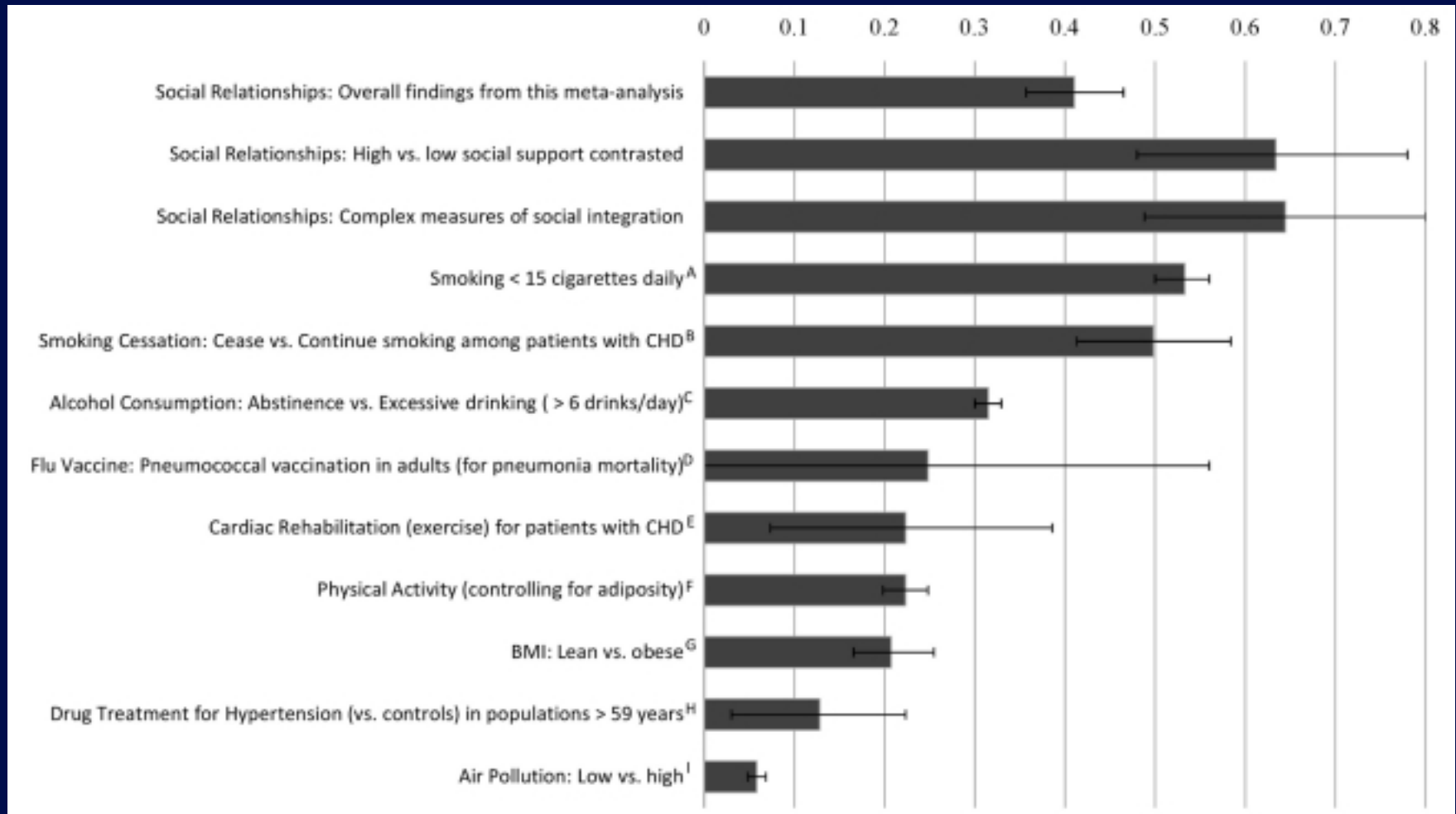
Stress in the city: social stress



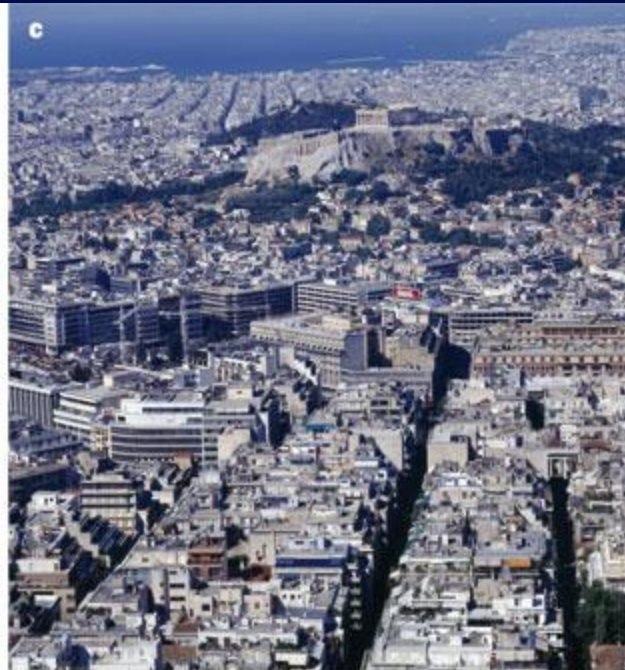
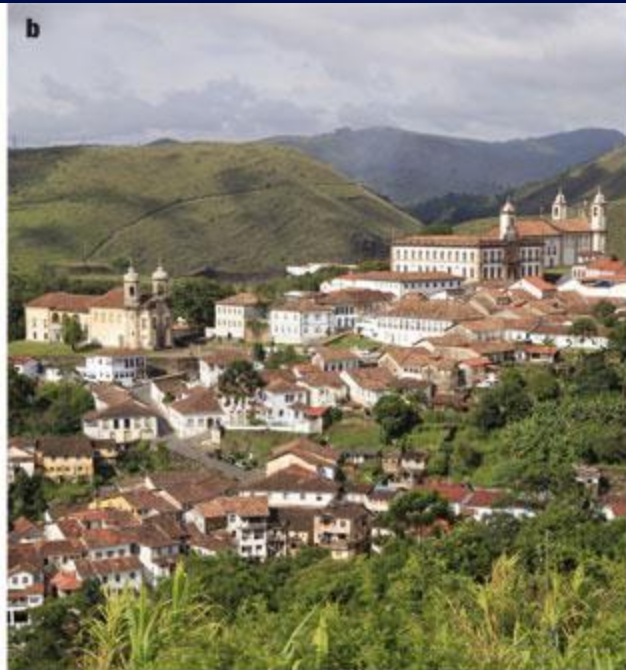
Social stress leads to behavioural alterations, irritability, mental disorders and higher mortality in many species.

Social isolation predicts mortality

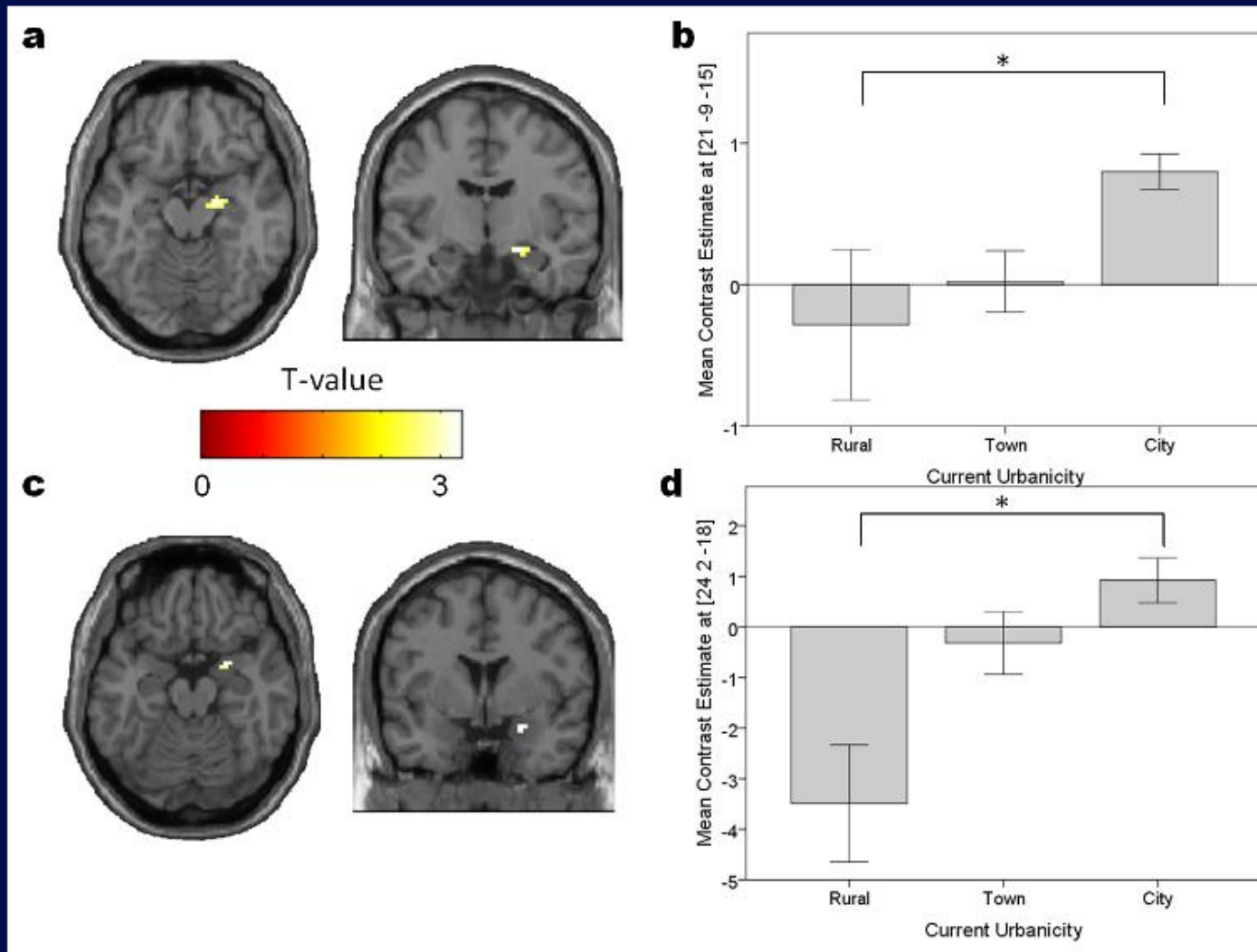
Meta-analysis: 148 studies, 308.849 participants



Holt-Lunstadt et al. 2010, PLoS Medicine

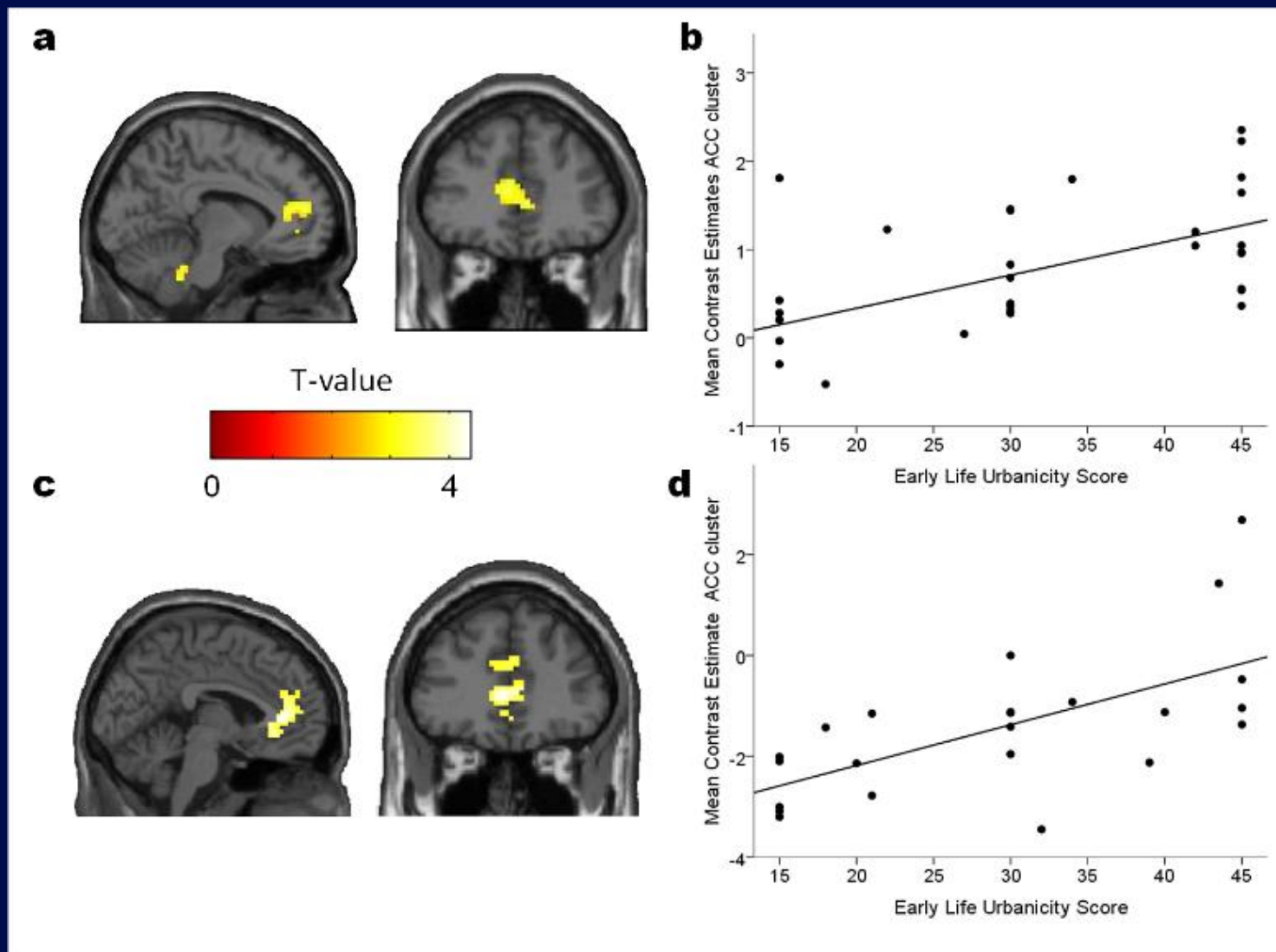


City living and amygdala activation



Lederbogen*, Kirsch*, Haddad* et al., **Nature** 2011

Urban birth tunes cingulate activation



Lederbogen*, Kirsch*, Haddad* et al., **Nature** 2011

Consequences for stress research in urban environments

- Cities do not cause mental disorders but can alter stress-associated emotional processing.
- **Large inter-individual differences** of stress vulnerability in an urban environment exist.
- Differentiate between **different types and degrees of urban stress** and how these translate into mental well-being and brain disorders.
- Increase understanding of **stress-protective factors** in cities.
- Long-term vulnerability effects of **urban stressors during childhood** need further research.



Strategies to improve mental health in urban areas

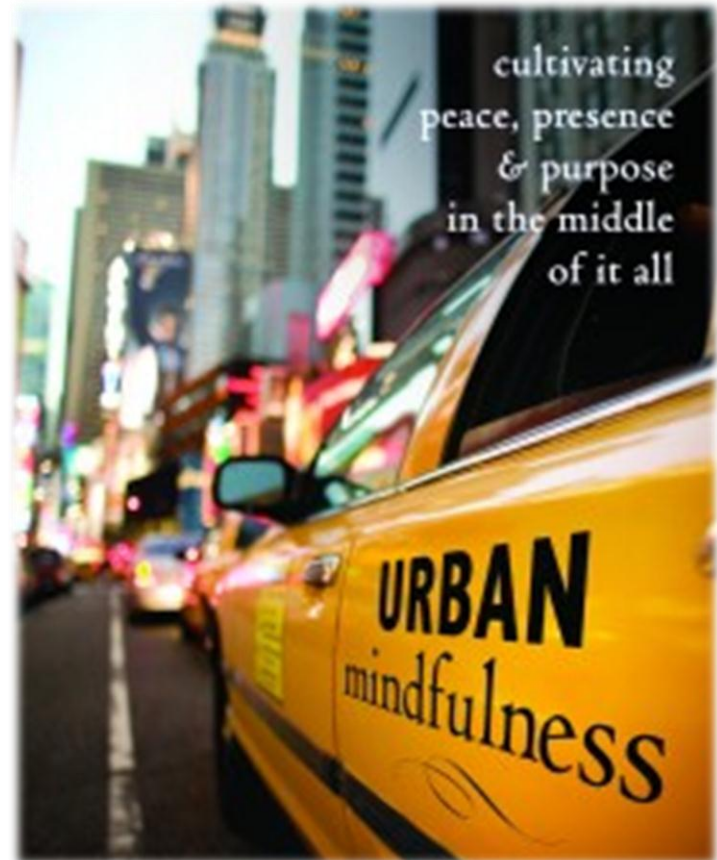
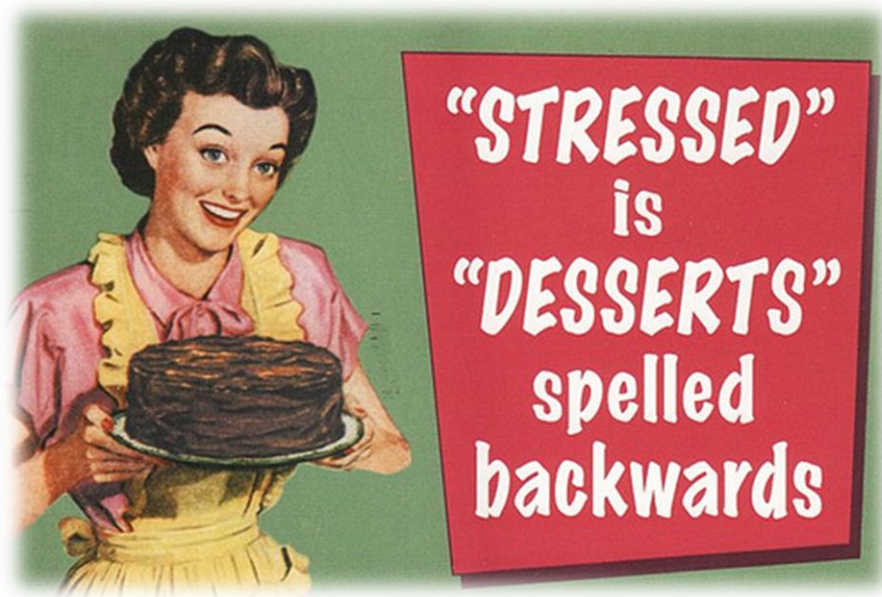
STRATEGY	EFFECT ON MENTAL HEALTH
Minimize experience of density but provide opportunities for social contacts	→ <i>reduce stress vulnerability</i>
Minimize social isolation particularly in high-risk populations	→ <i>increase resilience, decrease morbidity risk</i>
Provide sufficient health information on stress and stress management/recovery strategies for urban dwellers	→ <i>increase awareness and preventive behaviour</i>

Towards a „neurourbanism“

- Exchange between urban planning/architecture and neuroscience to investigate neurobiological impact of different modes of today's city living and develop the right metrics.
- **Psychiatrists:** understand the strategies, options and limits of shaping environments (→ public health, prevention of mental-ill health).
- **Architects/city planners:** use neuroscientific methodology to assess health impact, stress impact and quality of life of housing and urban planning.



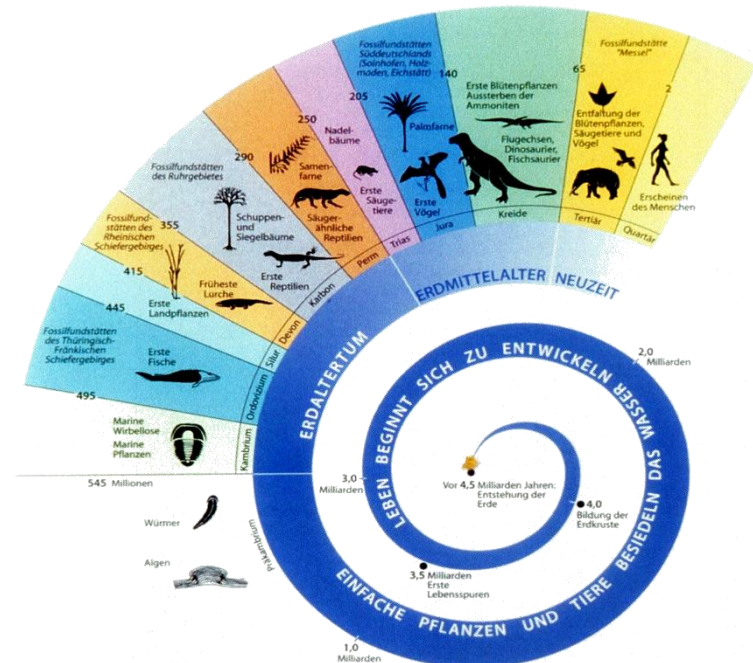
Thank you!



Our Biology is old, Evolution is slow !

The Mismatch (Gap) results in Diseases of Civilisation

Obesity, Metabolic Syndrome,
Diabetes, Hypertension, Stroke...
Osteoporosis...
Mental disorders, depression...



Environment, Civilisation is new, Changes are fast !