

The Urban Brain

Conceptualising the neurosocial city

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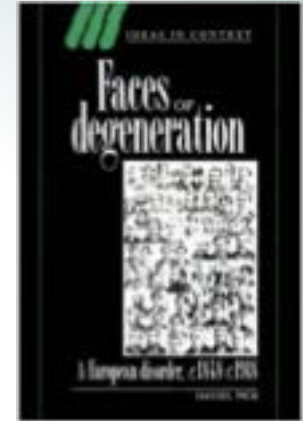
Website: <http://nikolasrose.com>

Des Fitzgerald and Nikolas Rose: *Vital City: Metropolitan life, mental health and the urban brain*, Princeton, 2019

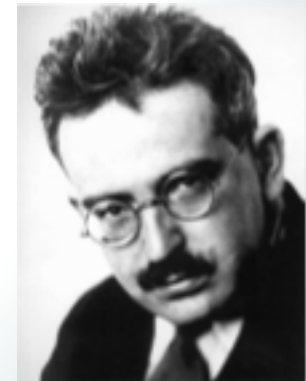
- Can we ‘revitalize’ the social sciences, as sciences of living human beings?
- Can we do this without repeating the reductionisms of the past?
- Can this help understand how experiences of poverty, inequality, precarity, gender discrimination, racism, stigma, social exclusion, isolation, threat and violence lead many to mental distress?
- Can we explore the possibilities through an analysis of a specific problem domain of contemporary importance?
 - eg mental health in megacities, and in particular the consequences of migration?
- Can we draw on insights from recent neuroscientific approaches to the social shaping of human brains and minds?
- What might we gain – conceptually, politically and practically – from such an approach to “the neurosocial city”

Note that this talk does not necessarily represent the view of both of us!

Into modernity, into the city



- **Degeneration in cities**
 - The foul moral and physical miasma of the city leads to a spiral to degeneracy
- **Charles Baudelaire (1821-1867):**
 - the ephemeral, the transient, the fleeting experience of modernity (*modernité*)
- **Walter Benjamin (1893-1940):**
 - the disintegration of coherent experience, the encounter with the crowd, the disjointed impressions of modern life.



The blasé mentality of the city dweller

The deepest problems of modern life flow from the attempt of the individual to maintain the independence and individuality of his existence against the sovereign powers of society, against the weight of the historical heritage and the external culture and technique of life. This antagonism represents the most modern form of the conflict which primitive man must carry on with nature for his own bodily existence. The

The psychological foundation, upon which the metropolitan individuality is erected, is the intensification of emotional life due to the swift and continuous shift of external and internal stimuli. Man is a creature whose existence is dependent on differences, i.e. his mind is stimulated by the difference between present impressions and those which have preceded. Lasting impressions, the slightness in their differences, the habituated regularity of their course and contrasts between them, consume, so to speak, less mental energy than

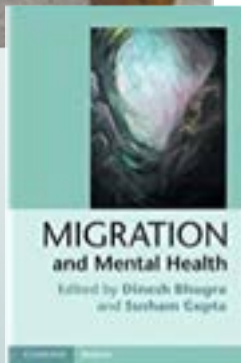
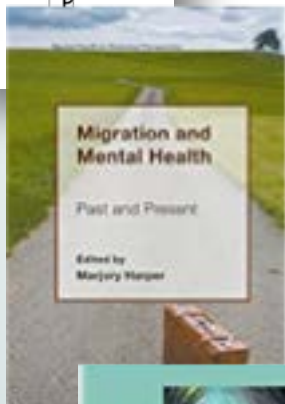
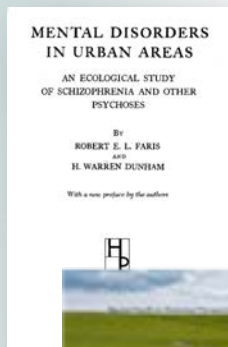
The Metropolis and Mental Life

Georg Simmel

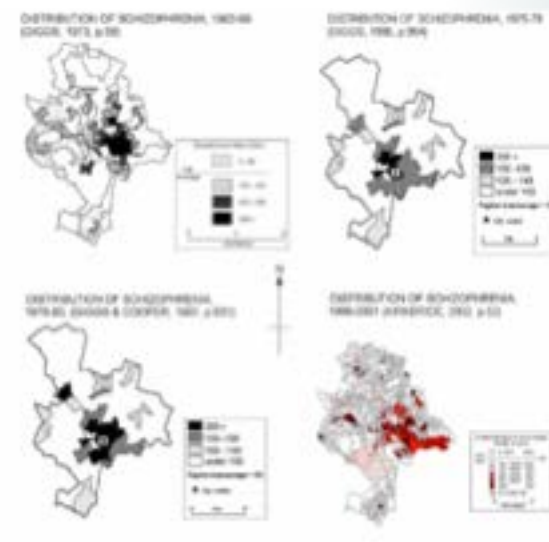
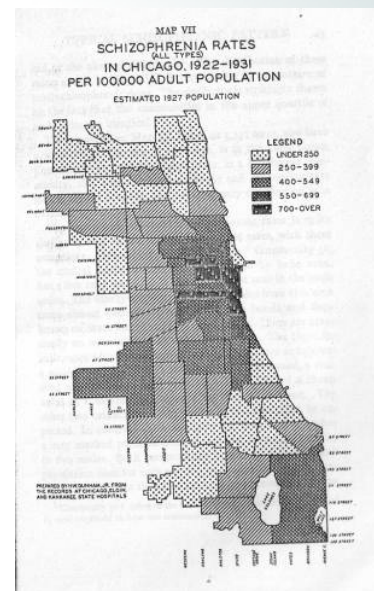
Just as an immoderately sensuous life makes one blasé because it stimulates the nerves to their utmost reactivity until they finally can no longer produce any reaction at all, so, less harmful stimuli, through the rapidity and the contradictoriness of their shifts, force the nerves to make such violent responses, tear them about so brutally that they exhaust their last reserves of strength and, remaining in the same milieu, do not have time for new reserves to form. This incapacity to react to new stimulations with the required amount of energy constitutes in fact that blasé attitude which every child of a large city evinces when compared with the products of the more peaceful and more stable milieu.

From the peaceful rhythms of the rural to the material and moral maelstrom of the city

Faris &
Dunham
1939



- Serious mental disorders concentrated in certain zones
- Early arguments that cities attract those of weak mentalities and drive them further into mental disorder
- A century of research on the mental disorders of urban dwellers, in particular migrants to the city
- Renewed concerns today given rapid urbanization and growth of megacities

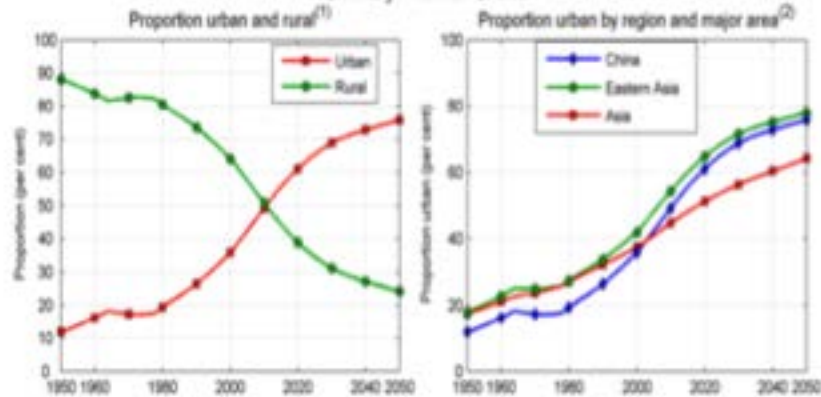


Giggs, 1973; Gigs, 1986
Giggs & Cooper, 1987;
Kirkbride, 2002
Slide courtesy James Kirkbride

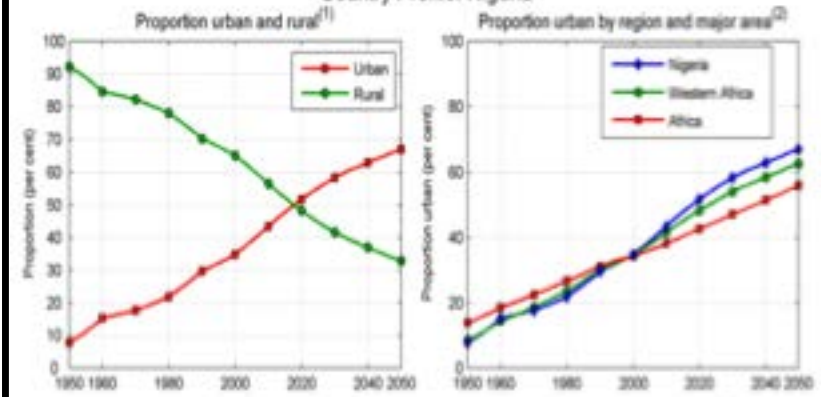
A new era of urbanization by rural-urban migration

<https://esa.un.org/unpd/wup/Country-Profiles/>

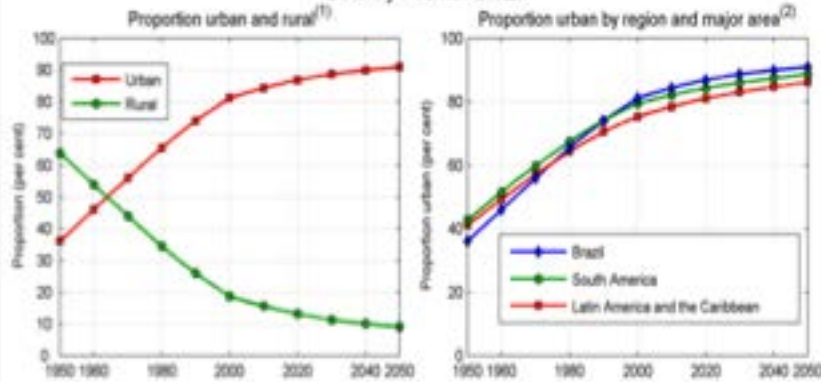
Country Profile: China



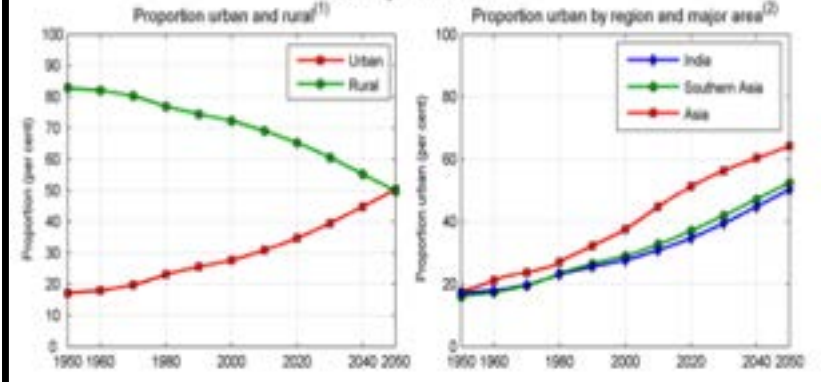
Country Profile: Nigeria



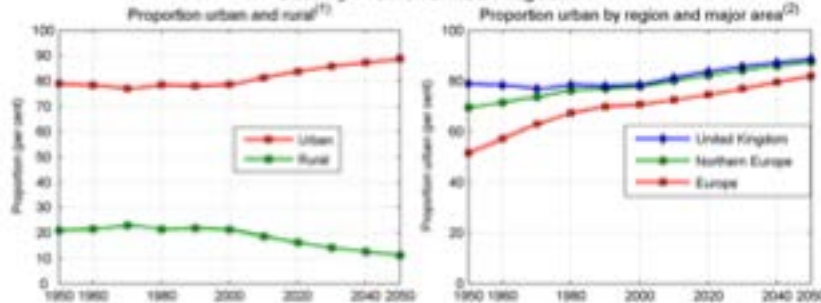
Country Profile: Brazil



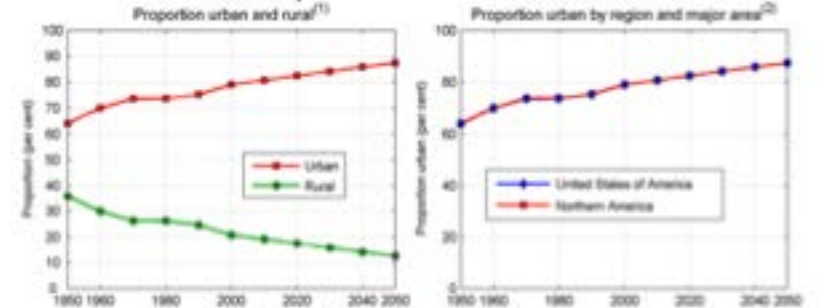
Country Profile: India



Country Profile: United Kingdom



Country Profile: United States of America



Mental health, migration, megacities today

- Those living in cities more likely to be diagnosed with severe mental disorders ('psychoses') than those living in rural settings.
- Higher rates of major depression in urban areas in some studies
- Evidence on anxiety, mood, post traumatic disorders in cities is ambiguous but many claims of increase in consequences of 'stress' for mental health.
- Difficult to identify what leads to diversity in 'urban' effects on different experiences of mental disorders and mental distress.
- Research on urban mental health in migrant and refugee populations, in the Global and Global South also ambiguous.
 - Most has focussed on transnational migration, not R-U
- Migration itself does not seem to be a consistent causal factor for mental ill health – indeed sometimes quite the reverse.
- Nonetheless, urban policies beginning to focus on mitigation of mental ill health in cities.

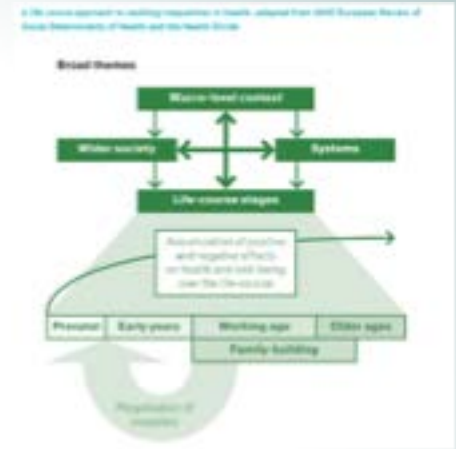
New urban biopolitics – eg Thrive NYC

- **Changing the culture**
 - to enable New Yorkers to have an open conversation about mental health, training people in ways of responding to those in mental distress and shifting the focus of mental health towards public health.
- **Acting early, prioritising preventive intervention**
 - especially in families and schools, repeating the familiar argument that earlier is almost always better, and early intervention services are key.
- **Closing treatment gaps**
 - by providing mental health care provisions locally in every community and thus improving access and impact, although a lot of the specific actions are around homelessness and opioid addiction.
- **Partnering with communities**
 - embracing the wisdom and strength of local communities, to create effective and culturally competent solutions, which seems to amount to trying to create pathways to specialist care for those with mental health needs.
- **Using better data**
 - by collecting reliable citywide data on the health and emotional wellness of children and the factors affecting it, and establishing a mental health innovation lab to analyse and interpret the data.
- **Strengthening the government's ability to lead**
 - by creating a mental health council to engage the community and implement the plans.



Part of new emphasis on social determinants of mental health

- WHO Report by Michael Marmot and his group on ‘the social determinants of mental health’
 - Systematic reviews consistently show common mental disorders “distributed according to a gradient of economic disadvantage”
- Poor and disadvantaged suffer disproportionately from common mental disorders and their adverse consequences
 - Both in Global North and in Global South
- Studies contradictory about aspects of social disadvantage that are important
 - Bad experiences in childhood, financial stress, poor housing, bad education, insecure employment, social isolation etc
- **Focus on ‘STRESS’ as mechanism**
 - ‘stressful experiences’ across the life course, which map onto the gradient of disadvantage
 - Accumulate from conception – ‘toxic stress’ in childhood’
 - Can be mitigated by ‘buffers’





Too toxic to ignore

A stark warning about the societal costs of stress comes from links between shortened telomeres, chronic stress and disease, say **Elizabeth H. Blackburn** and **Elissa S. Epel**.

STRESS

**URBAN
DECAY**

SCIENTISTS ARE TESTING THE
IDEA THAT THE **STRESS** OF
MODERN CITY LIFE IS A BREEDING
GROUND FOR **PSYCHOSIS**.

Life stresses

It is time for sociologists and biologists to bury the hatchet and cooperate to study the effects of environmental stress on how people behave.

SCIENTIFIC AMERICAN
MIND

HEALTH

Urban Living Raises the Risk of Emotional Disorders

Mounting evidence shows how city living can harm our mental health

By Andreas Meyer-Lindenberg on March 1, 2013

Stress makes its molecular mark

Trauma affects people differently. Epigenetics may be partly to blame, says **Eric J. Nestler**.

“Buffers” against stress?

- Effects of “stressful experiences” can be reduced if they are “buffered by social supports in the form of emotional, informational, or instrumental resources provided by or shared with others, and by individual capabilities and ways of coping.”
- “Those lower on the social hierarchy are more likely to experience less favourable economic, social, and environmental conditions throughout life and have access to fewer buffers and supports.”
- “These disadvantages start before birth and tend to accumulate throughout life, although not all individuals with similar exposures have the same vulnerabilities; some are more resilient or have access to buffers and supports to mitigate the potential mental health effects of disadvantage and poverty.”
- (World Health Organization, 2014, Social determinants of mental health, WHO, p. 16)

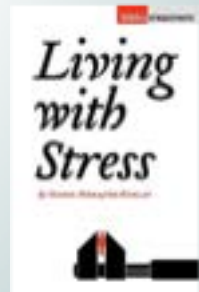


Selfies : Stress Reliever & Mood Booster



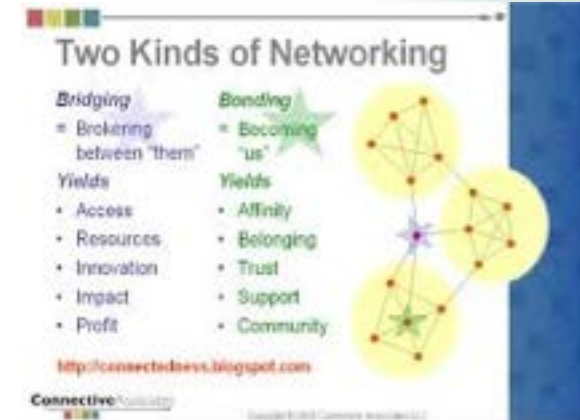
- Selfies' help develop personal empowerment and social dialogue
- Promotes body acceptance and self-love
- Increase in positive moods
- Boosts confidence
- Buffers academic stressors

Beat the blues - stop & take a 'selfie'.



Beyond 'Social Capital'

- 'Social capital' as a way of talking about buffers – networks, relationships, mutual trust ...
 - E.g: "Social capital is critical, because it facilitates social integration (a dynamic process by which members of a social group participate in dialogue or collaborate to achieve a shared social goal). Income inequality ... undermines social capital and social integration, promoting social isolation, and loneliness. It also undermines perceptions of fairness (a component of trust).."
- Research shows objective material conditions do not directly account for links between MH and social disadvantage.
- Subjective responses to material conditions are decisive. (cf idea of cognitive social capital)
- Hence the need for a much clearer analysis of pathways, processes and mechanisms through which 'experience' of poverty, precarity, exclusion, racism ... 'adversity gets under the skin'
- And hence how its consequences can be mitigated



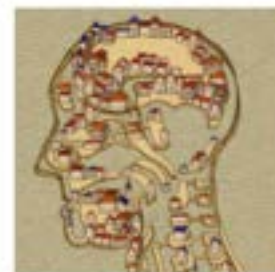
SOCIAL NETWORKS	TRUST AND RECIPROCITY	NORMS
<ul style="list-style-type: none"> • Network Structure (e.g. density, diversity, size, centrality, heterogeneity) • Relationships, ties and connections • Social cohesion 	<ul style="list-style-type: none"> • Generalised trust • Institutionalised trust • Interpersonal trust • Reciprocity 	<ul style="list-style-type: none"> • Shared norms • Civic norms • Values • Goals



URBAN BRAIN LAB

The Urban Brain Lab is an experiment in resetting the relations between the sociological and neurobiological sciences. [Click here for more background.](#)

URBAN BRAIN LAB



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A Transforming Social Science project, funded by the Economics and Social Research Council, based at the Department of Social Science Health and Medicine, King's College London

M³: Mental health, migration and the megacity



Migration and mental health - China

- **By 2015, 277 million rural-urban migrants in China**
 - those living in cities but without the official urban residency permit or hukou
- **Making up around 36% of the entire working population**
- **What might be the consequences for their mental life and health**
- **Some studies show worse mental health among the migrants than among the urban population**
- **Other studies show the reverse,**
- **Some find mental health poorer among migrants than in their villages, others show reverse**
- **Precarity correlated with poor mental health:**
 - Long working hours, hazardous working environment, without a formal employment contract are associated with poorer mental health, as is high pressure management, but
 - Job stability and participation in social insurance schemes is conducive to better mental health.
 - Perceptions of stigma and discrimination are associated with poor mental
- **Migrants use of services if they experience mental ill health:**
 - Make less use of normal medical or mental health services than their urban counterparts
 - More likely to make use of traditional Chinese medicine and its practitioners
 - M likely to participate in Internet self-help groups.
- **Can we bring to the migrants of our age the kind of approach that Simmel and others brought in their time?**

But

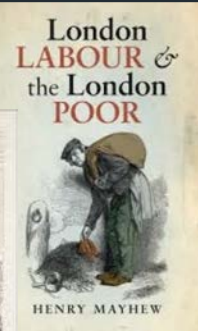
What is a city anyhow?

(note that this has been much discussed at a conceptual level among those interested in Actor Network Theory, urban assemblages, actants, cosmopolitics and other matters of high theory which I sidestep here)

And what is it that leads to its
mental consequences?

Would that knowledge enable a
different urban biopolitics?

What is 'the city'?



Mayhew's
London



What is 'the city'?



Berlin around 1900

Baudelaire,
Benjamin and
Simmel's cities

Paris around 1900



What is 'the city'?



Detroit 2000's



WELCOME TO DETROIT, 2012

What is 'the city'?



Shanghai - Pudong

London



Mumbai



Eton



Rio



What is a city anyhow?

Pudong, Shanghai



Songjiang, Shanghai



Favela Rio



Favela Sao Paulo

What is it in the urban that can be detrimental to mental health?

- Urban drift?
- Moral miasma?
- The experience of migration?
- The mentality of the migrant?
 - Flux, change, multitudes?
- Overcrowding and density?
 - Racism, stigma, exclusion?
 - Poverty, poor housing?
 - Poor employment?
 - Pollution, noise, bugs?
 - Isolation, loneliness?
 - Stress...?

An ecological approach

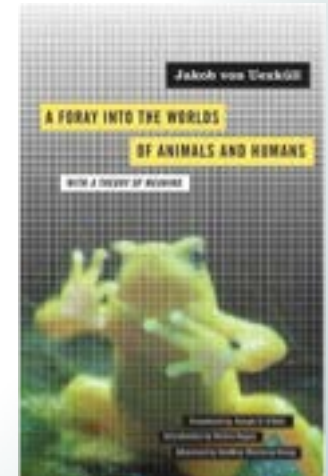
ecological niches and biosocial localities*

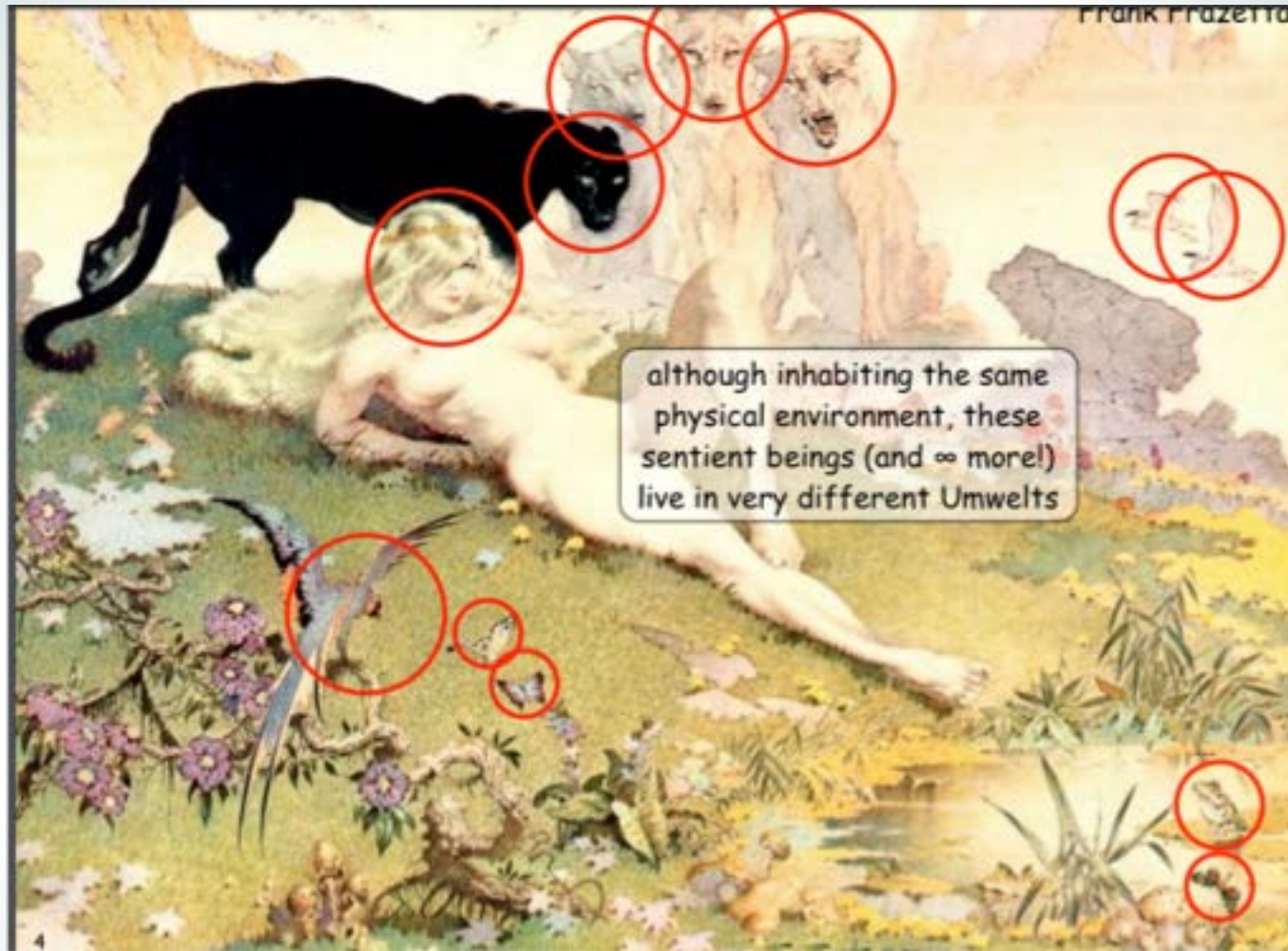
- **Ecological niche in ecology:**
 - “the role and position a species has in its environment; how it meets its needs for food and shelter, how it survives, and how it reproduces. A species' **niche** includes all of its interactions with the biotic and abiotic factors of its environment.”
- Niches not fixed spaces but trajectories across space and time, composed of relations and transactions with humans, non-human, and the social and material environment.
- Biosocial pathways, inhabited and navigated by individuals or groups in their forms of life
- The city as a multiplicity of such ecological niches, not for a ‘species’ but for an individual or group of individuals.

* See also the related approach of Joerg Niewoehner on this theme. Bister M, Klausner M and Niewöhner J (2016) The cosmopolitics of 'niching': Rendering the city habitable along infrastructures of mental health care. In: Blok A and Farías I (eds) *Urban Cosmopolitics: Agencement, Assemblies, Atmospheres*. Abingdon: Routledge, pp. 187-205.

The Umwelt

- Of course, niche is a concatenation of materialities: spaces, crowds, noise, bugs, pollutants.....
- But niche not simply ‘objective’ – but more like the ‘umwelt’ of the life forms described by Jakob von Uexküll
 - Umwelt is the ‘internal model’ that an organism has of ITS world, shaped by its particular sensory apparatus – what it can see, hear, smell, feel – and the elements that are of salience to it – its sustenance, its threats, its prey, its conspecifics, its points of reference....
- Umwelt is the particular array of saliences, persons, buildings, visibilities, affects as experienced by those who navigate that biosocial niche
 - Your umwelt will not be mine, even if we live and move around the same spaces and place





UMWELTS

Thanks to Jan Koenderink

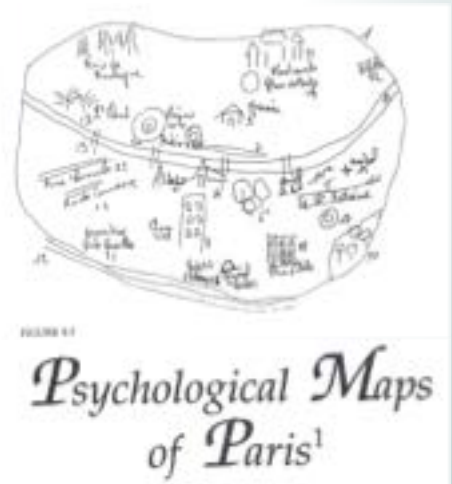
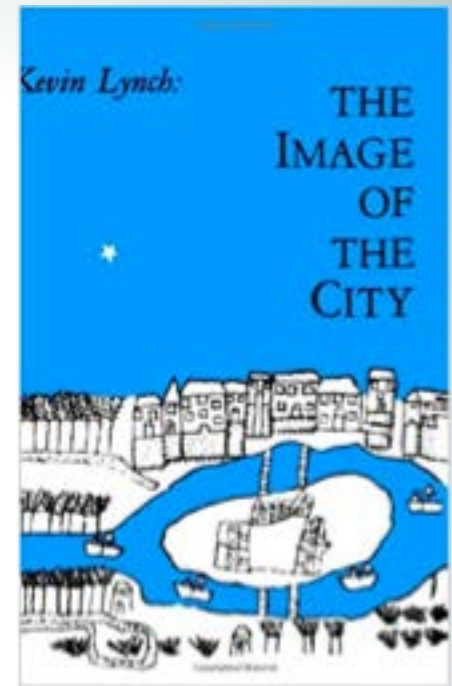
<http://www.gestaltrevision.be/pdfs/koenderink/Umwelts.pdf>

Cognitive and Affective Maps

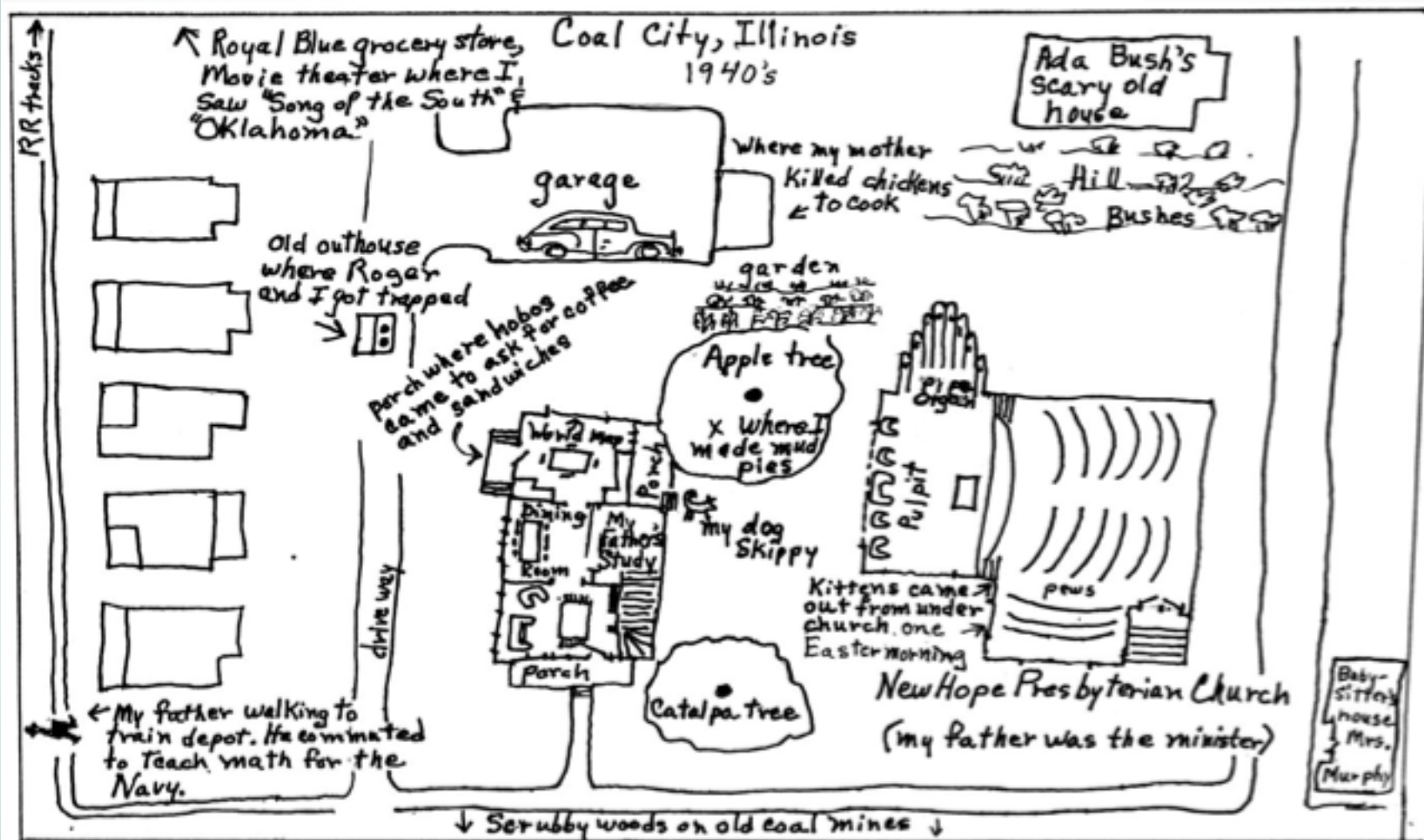
(Kevin Lynch and Stanley Milgram)

- Perhaps something like a the cognitive or mental maps devised by Kevin Lynch and Stanley Milgram
- But these are more than cognitive: sensory, semantic, affective map of the spaces and places and pathways and routes that you and I inhabit.
- A 'map' whose diverse locales, saliences and 'atmospheres' are 'semiotically' encoded – ie shaped by meaning
- Populated with memories associated with dread, fear, trauma, delight, hopes, expectations....
- Including the 'reflexive' semiotics of mental life and mental health – ways of 'relating to oneself' - understanding, encoding and communicating ones own state of well-being, distress, disorder, disease....
- These 'maps' indicate something of how individuals inhabit and negotiate the imagined city
 - Mostly non-conscious, habitual, but can become habitual, but can be constantly in flux, disrupted, full of uncertainty etc

S. Duncan, Mental Maps of New York, New York, Dec. 19, 1977; research conducted by Stanley Milgram.



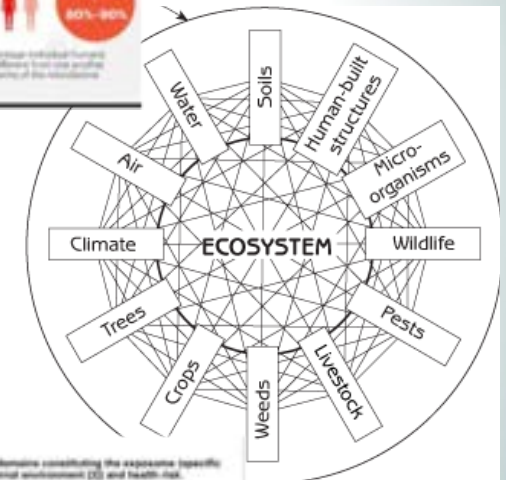
S. Milgram and D. Jodelet, 1976
Reprinted in Milgram et al, 1992,
The Individual in a Social World,
McGraw Hill.



Unnumbered Figure pg 3
World Regional Geography, Third Edition
© 2006 W. H. Freeman and Company

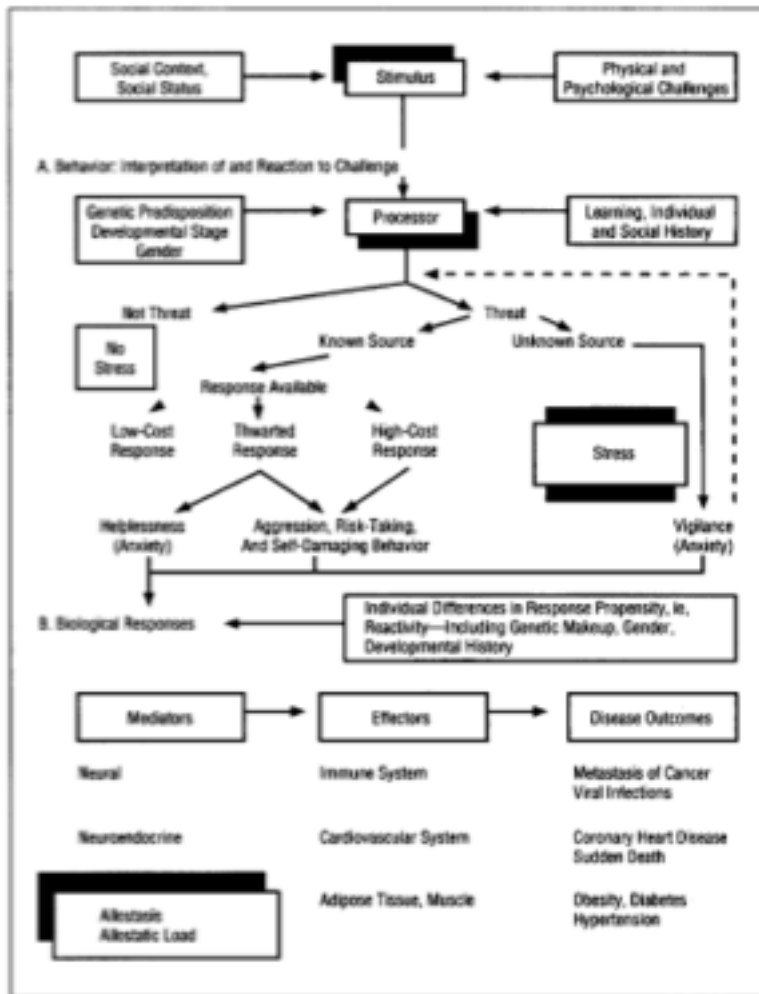
Biological Localities

- But it is also a ‘biological locality’
 - Cf Margaret Lock’s notion of a local biology*
- That is to say a niche occupied by non-human living organisms
- And all the vectors of terrain, shelter and exposure, heat, light, water, pollutants, bugs, that make up the niche for humans
- And one which has itself consequences for mental health
- Via exposures, pollutants and microbiome



* Cf. Niewöhner, J. and Lock, M. 2018. Situating local biologies: Anthropological perspectives on environment/human entanglements. BioSocieties, 1-17

But mechanisms get complex



McEwen and Stellar, 1993

3 Organizing the Sociological Landscape for the Next Decades of Health

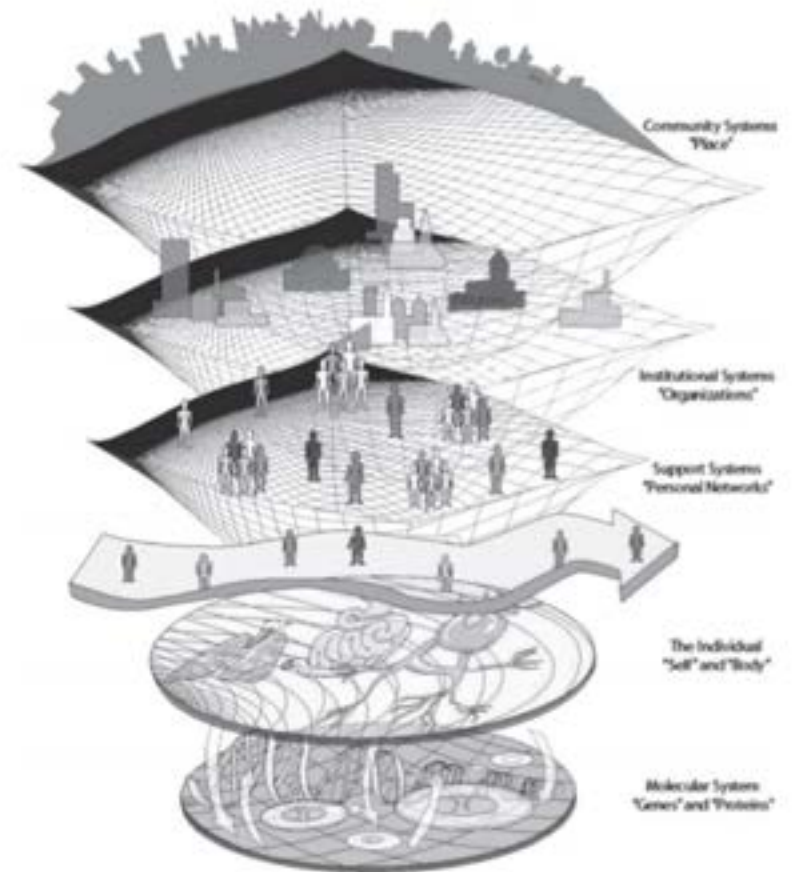


Fig. 3.2 Network episode model III-R, Primary level subsystems

NEM III R (Network Episode Model)
(Pescosolido, 2006, 2011; Perry and Pescosolido, 2015).

Should we care about mechanisms?

- “Who cares about mechanisms, we know what is bad for people, lets tackle that first”
- Link & Phelan – ‘fundamental causes’- not risks- what puts people ‘at risk of risk’
 - Social factors such as socioeconomic status and social support “are likely ‘fundamental causes’ of disease that, because they embody access to important resources, affect multiple disease outcomes through multiple mechanisms, and consequently maintain an association with disease even when intervening mechanisms change.”
- **YES** we need to understand what puts individuals and groups “at risk of risk”
 - Though SES is not a cause but crude attempt to conceptualise differences in resources
- **BUT** without understanding mechanisms, may think nothing possible prior to major social transformation: small changes leave fundamental causes untouched.
- **AND** we may misidentify roots of the problem and hence form of intervention
 - Stress and inflammation mechanisms for mental ill health arising in specific niches lead to radically different modes of intervention than genomics and neurotransmitters

Mechanisms of STRESS for example

- “Everybody knows what stress is and nobody knows what it is”
(Hans Selye, 1975)
- “Perhaps the single most remarkable historical fact concerning the term “stress” is its persistent, widespread usage in biology and medicine in spite of almost chaotic disagreement over its definition” (Mason, 1975)
 - Stress – objective?
 - Early research used experiments with rats as exemplar of consequences of overcrowding – extrapolated to humans
 - Stress – ‘subjective’
 - Later research showed stress is ‘subjective’
 - “Stress is a state of the mind” (McEwen 2012)
 - How an individual encodes experience
 - Rats no exemplar
 - One person’s stress is another person’s pleasure
 - From individual to social and cultural shaping of stress
 - Social and cultural shaping of conditions for resilience to stress
- Stress is a characteristic of ecological niche, umwelt....

McEwan – Brain Drives Stress Response

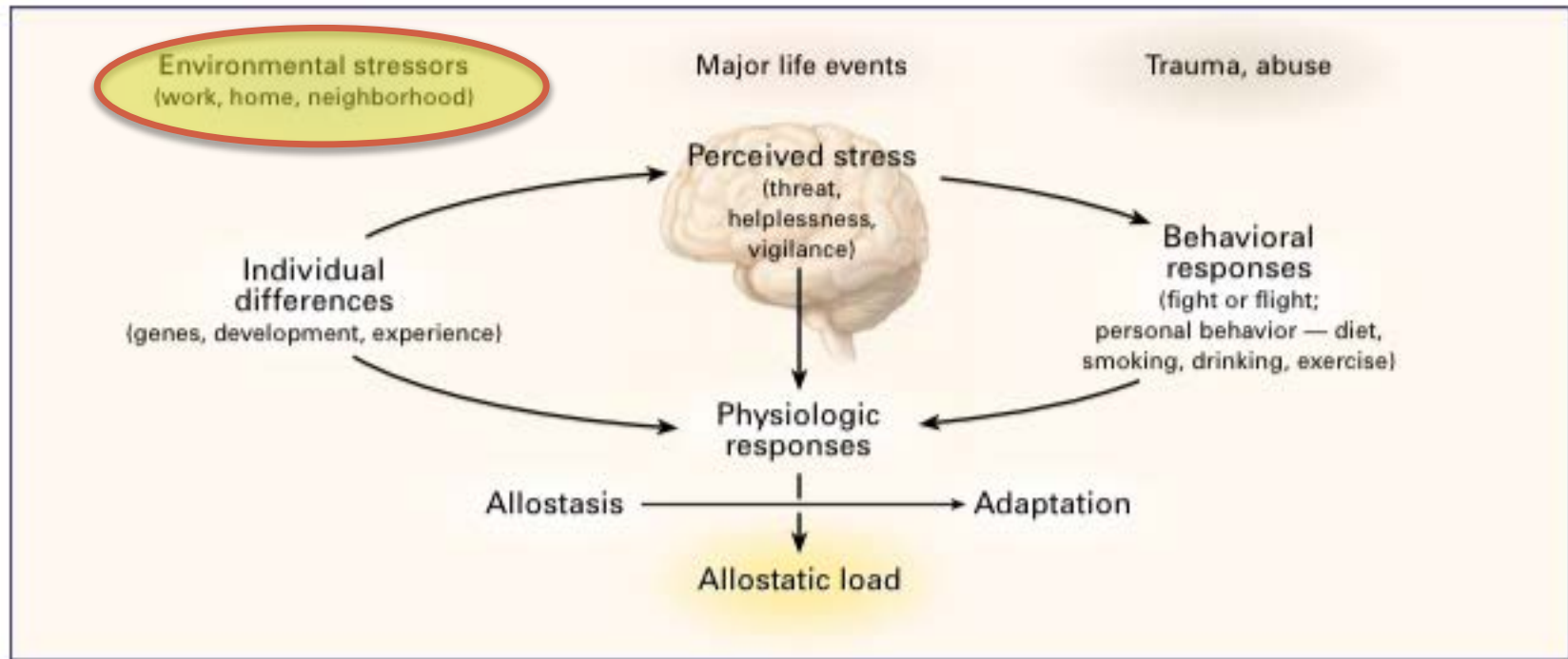


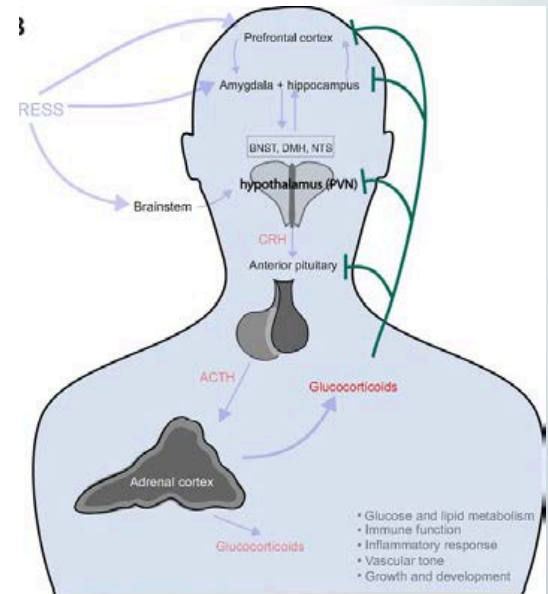
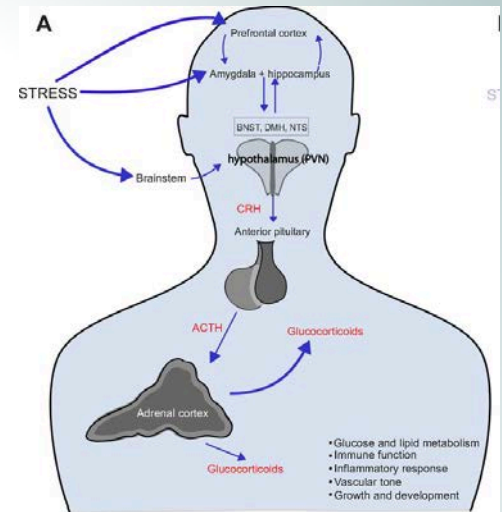
Figure 1. The Stress Response and Development of Allostatic Load.

The perception of stress is influenced by one's experiences, genetics, and behavior. When the brain perceives an experience as stressful, physiologic and behavioral responses are initiated, leading to allostasis and adaptation. Over time, allostatic load can accumulate, and the overexposure to mediators of neural, endocrine, and immune stress can have adverse effects on various organ systems, leading to disease.

McEwen, B.S., Protective and Damaging Effects of Stress Mediators. *New England journal of medicine*, 1998. 338(3): p. 171-179.

Mechanisms of Stress

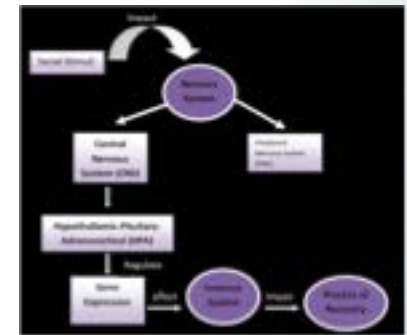
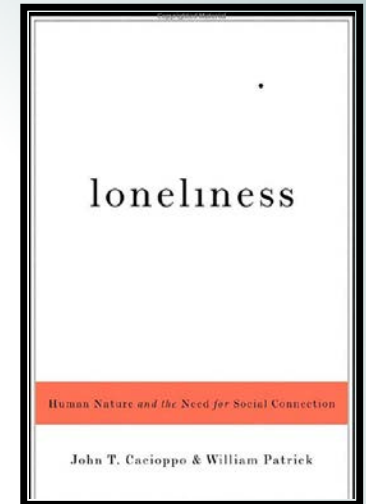
- **Structural plasticity of key areas of brain**
 - Hippocampus, amygdala, pre-frontal cortex
- **Mediated by glucocorticoids**
 - Hormones that affect immune system (eg cortisol)
 - And others oxytocin, corticotrophin releasing factor...
- **Affect neurogenesis – production and integration of new neurons**
- **Perhaps by effects on epigenesis**
 - activation or deactivation of gene sequences in certain cells in particular regions of the body under certain environmental influences across the life course
- **McEwan focus on ‘toxic stress’ in childhood**
- **But knowledge of ‘environmental factors’ sketchy**



Laura Senst, and Jaideep Bains J Exp Biology, 2014;217:102-108

Beyond 'stress'....

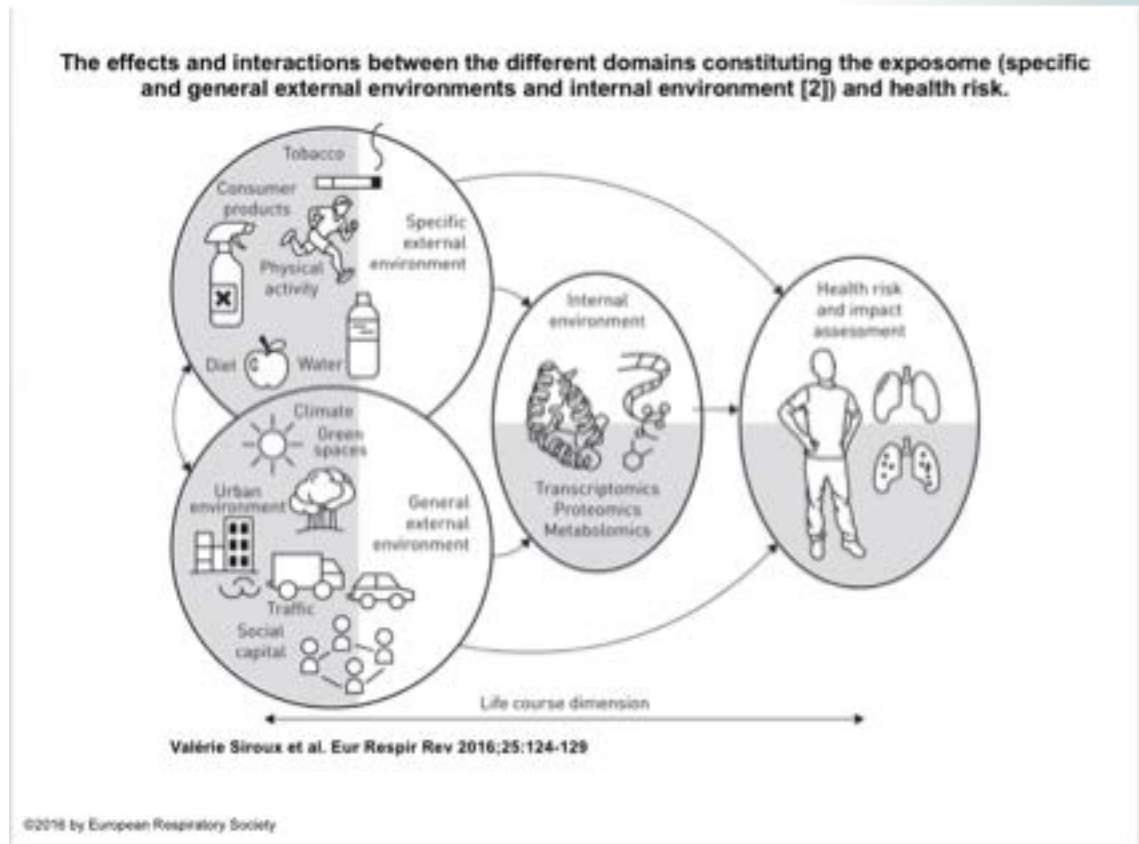
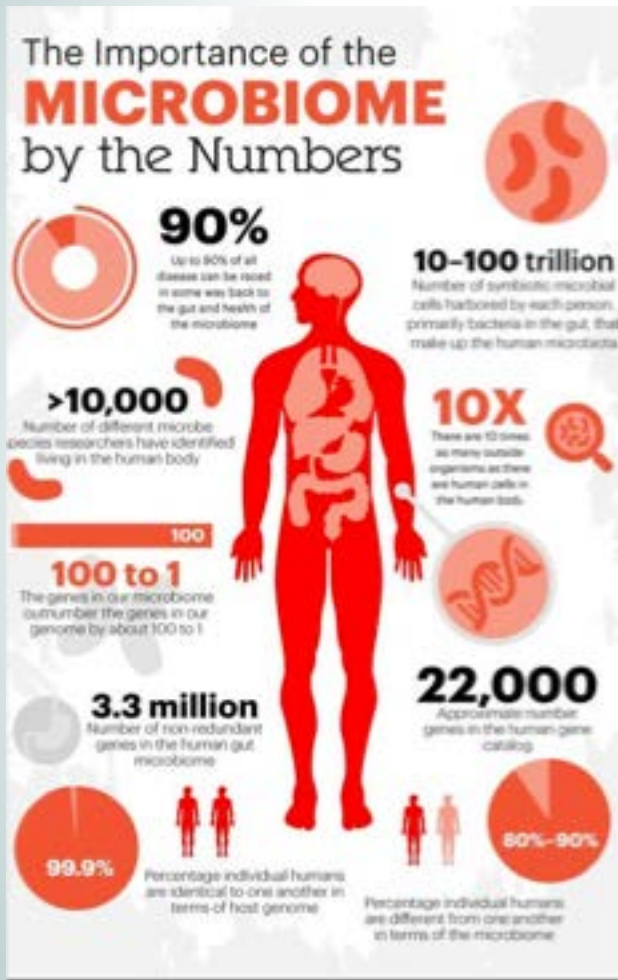
- **Loneliness (John Cacioppo)**
 - The social environment... is fundamentally involved in the sculpting and activation/inhibition of basic structures and processes in the human brain and biology.... social isolation or **perceived social isolation (loneliness)** gets under the skin to affect social cognition and emotions, personality processes, brain, biology, and health.
 - This research also showed how **the subjective sense of social isolation (“loneliness”)** uniquely disrupts our perceptions, behavior, and physiology, becoming a trap that not only reinforces isolation, but can lead to early death.
- ie loneliness (and trauma) are relations with ones Umwelt, shaped in terms of a mental map of the niche in which one dwells.



<https://dsw2010.wordpress.com/effects-on-health/>



And there are many other biosocial pathways that are proving to be crucial to (mental) health....



Another biopolitics is possible
for the 'neurosocial city'

But need to avoid resort to the simplicity of the laboratory!

A New Biology for a New Century

Carl R. Woese*

Department of Microbiology, University of Illinois, Urbana, Illinois 61801

“In the last several decades we have seen the molecular reductionist reformulation of biology grind to a halt, its vision of the future spent, leaving us with only a gigantic whirring biotechnology machine.... biology is at the point where it must choose between two paths: either continue on its current track ...or break free of reductionist hegemony, reintegrate itself, and press forward once more as a fundamental science. The latter course means an emphasis on holistic, “nonlinear,” emergent biology....

A heavy price was paid for molecular biology’s obsession with metaphysical reductionism. It stripped the organism from its environment; separated it from its history, from the evolutionary flow; and shredded it into parts to the extent that a sense of the whole—the whole cell, the whole multicellular organism, the biosphere—was effectively gone...”

Our task now is to resynthesize biology; put the organism back into its environment; connect it again to its evolutionary past; and let us feel that complex flow that is organism, evolution, and environment united.

A true 'social' neuroscience...

A social neuroscience beyond molecular reductionism

- **Social stress, inflammation and the HPA axis**
 - Hormones that affect immune system (eg cortisol) and others oxytocin, corticotrophin releasing factor...
- **Socially shaped epigenetics:**
 - processes of gene activation and de-activation across an individual's life, in response to inputs from the milieu.
- **Socially modulated neuroplasticity:**
 - neural circuits are shaped and reconfigured across the life course, both in terms of structure and in terms of function in response to experiences.
- **Socially related neurogenesis:**
 - the production and integration of new nerve cells, to replace those that are dead or damaged, a process which can be stimulated or inhibited by factors from exercise to diet.
- **The socially mutated microbiome:**
 - Human and other animals inhabited by thousands and millions of bacteria
 - Play key part in maintaining, or reducing, both physical and mental health
 - Acutely sensitive to exposures in environment, including the built environment, and form of life of the human being that they live with.
- **The socio-political exposome:**
 - cumulative effect on the organism of environmental insults from pollution and radiation to diet and noise.
- **A new conception of the biosocial itself – an new ontology of the human vital organism**

Also requires a new understanding of 'social'

- Sociological and ethnographic investigations to map out the shaping of stressors by collective experiences
 - Poverty, exclusion, isolation, racism and violence
 - The urban infrastructure
 - The urban urban 'sensorium' of noise, smell, touch, and microbes.
- A finer grained, ethnographically informed analysis of the accumulation of urban situations that constitute stress, their spatial, temporal and sensorial characteristics.
 - a variety of subjective experiences
 - perceived as stressful as a result of individual biography, culturally shaped meanings and environmental insults
 - translated into neurobiological configurations
 - with deleterious consequences for brain and body.
- Identify what within urban life mitigates against stress
 - Redrawing mental maps of the city
 - Reshaping ecological niches through cafes and corner shops, informal friendships or forms of collective organization.

A different urban biopolitics?

- With an ecological approach to urban experience in terms of material and mental experiences across niches, or habitats
- Grounded in a biosocial approach to mapping urban habitats
- We might be better able to advise on policies to mitigate mental distress in urban environments, and on practices likely to promote recovery.
 - Could this inform strategies to create 'healthy, safe and sustainable cities' through architecture and urban design, housing, mobilities, management of biophysical environments from microbes to air quality.
- Transforming questions such as urban justice or the 'right to the city'.
- Another urban biopolitics is possible.

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Thank you for your attention