Class Six

Urban Policy

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Class Six

The Root Causes of Urban Outcomes

We have established that cities are complex adaptive systems out of which urban outcomes emerge

- Components have own agendas (schema) which they adapt in response to feedback loops and changes in their environment (changes in control parameters and introduction of attractors)
- Strongly interconnected “seamless webs” in hierarchies
- Subject to phase transitions, tipping points and emergent behavior
- Unlimited horizon (both in time and scope), never settles into an equilibrium state
- System is irreducible/non-generalizable

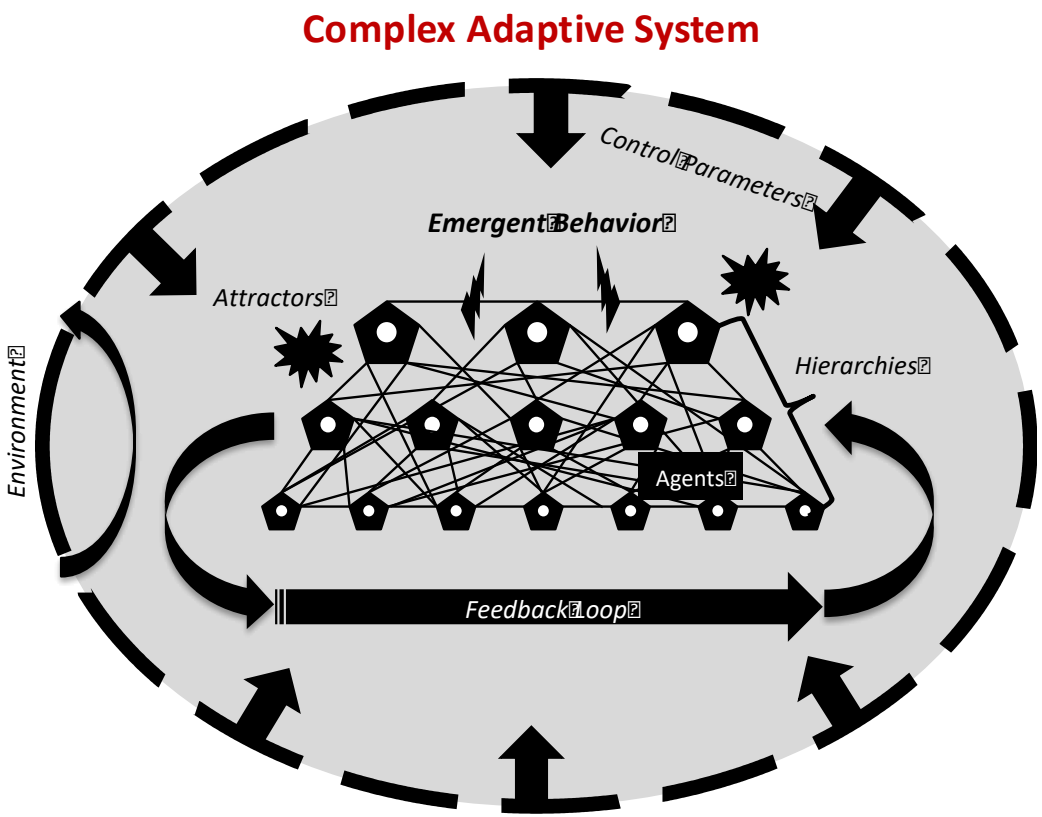
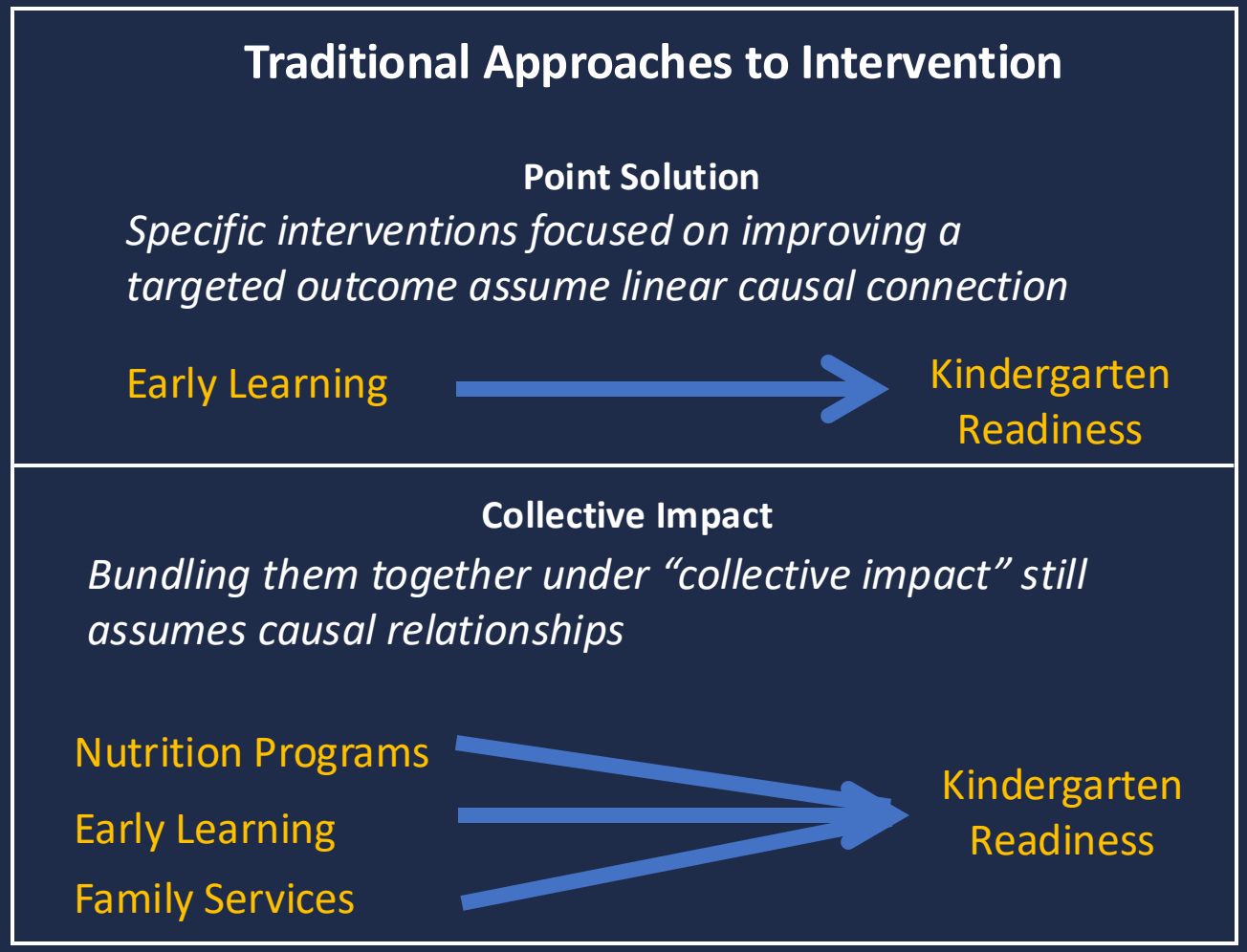


Figure 1: System-wide behavior emerges from a complex adaptive system as agents interact and adapt to changes in their environment

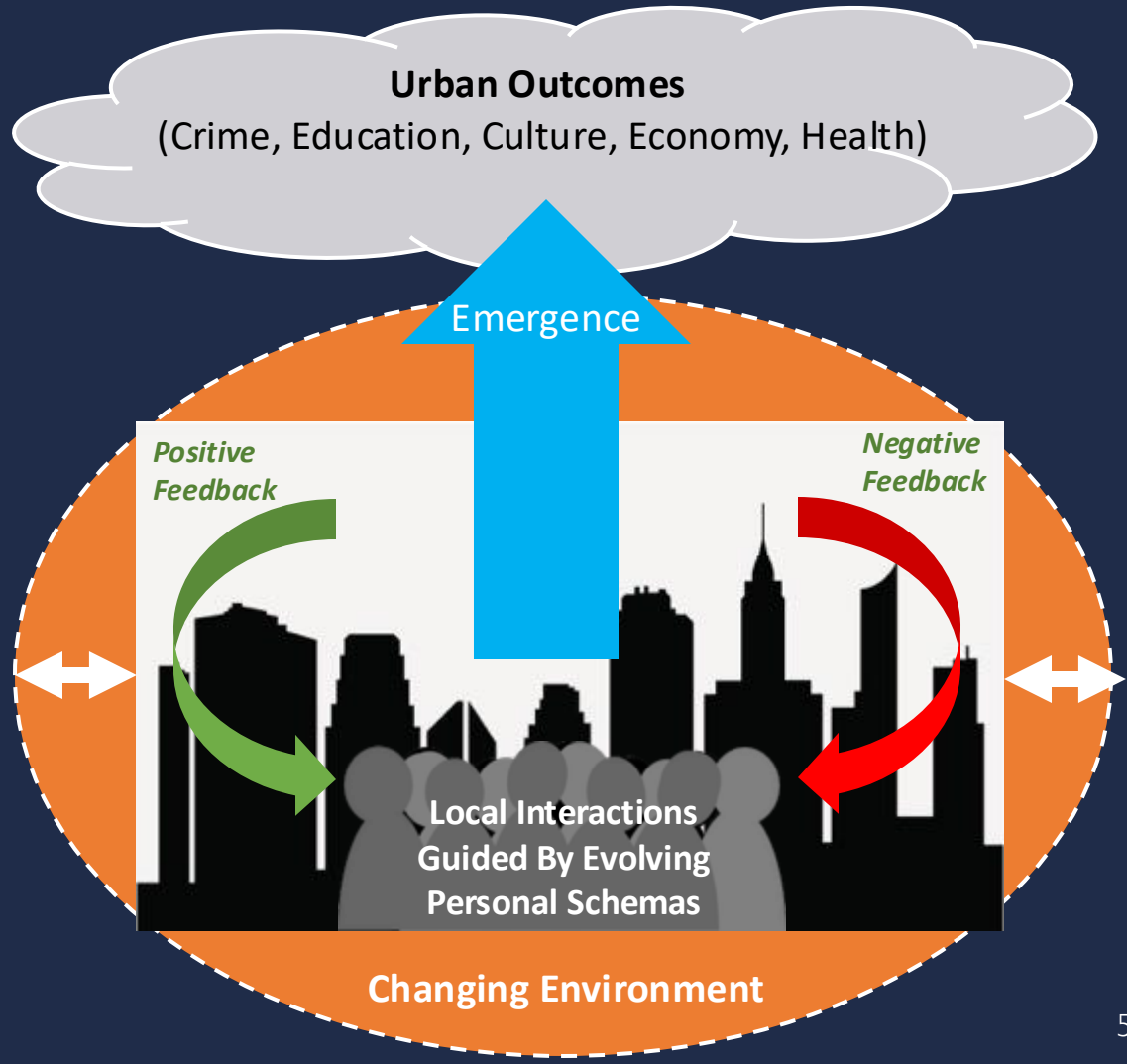
However, most of what we do to improve outcomes doesn't acknowledge the type of problem that cities are

- Traditional approaches to improving urban outcomes assume that causal relationships can be established
- Sociological studies that "hold everything else constant" are attempts to establish these relationships
- Rarely do they ever fully define the mechanisms by which the intervention actually generates the outcome



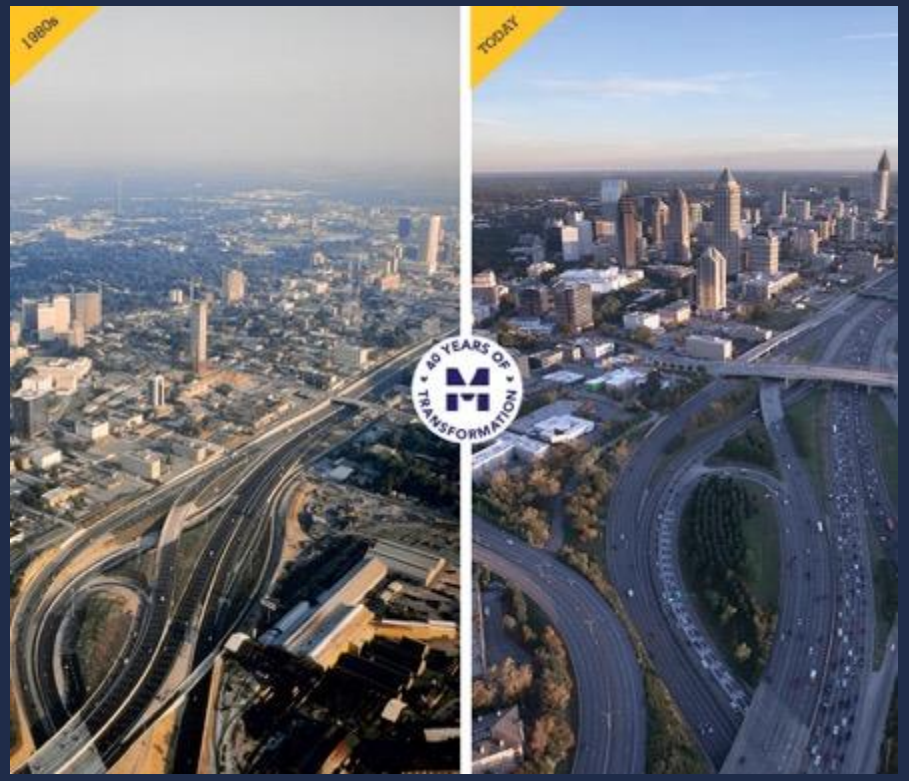
But if the outcomes we care about are emergent in the Jacobs sense of the term, this is a flawed approach

"With any complex system we cannot turn to the traditional program of reductionism, the analytical mode of the controlled experiment, whether bench (direct control and deterministic account) or statistical (control through random allocation and probabilistic account). That is to say we cannot decompose the system into its elements and use control over discrete elements while varying just one of them, in order to establish causality. The absolute content of the notion of emergence denies that such an approach can tell us anything useful about complex systems." *David Byrne and Gill Callaghan*



The goal should not be to isolate causes, but to understand the *nature of effects*

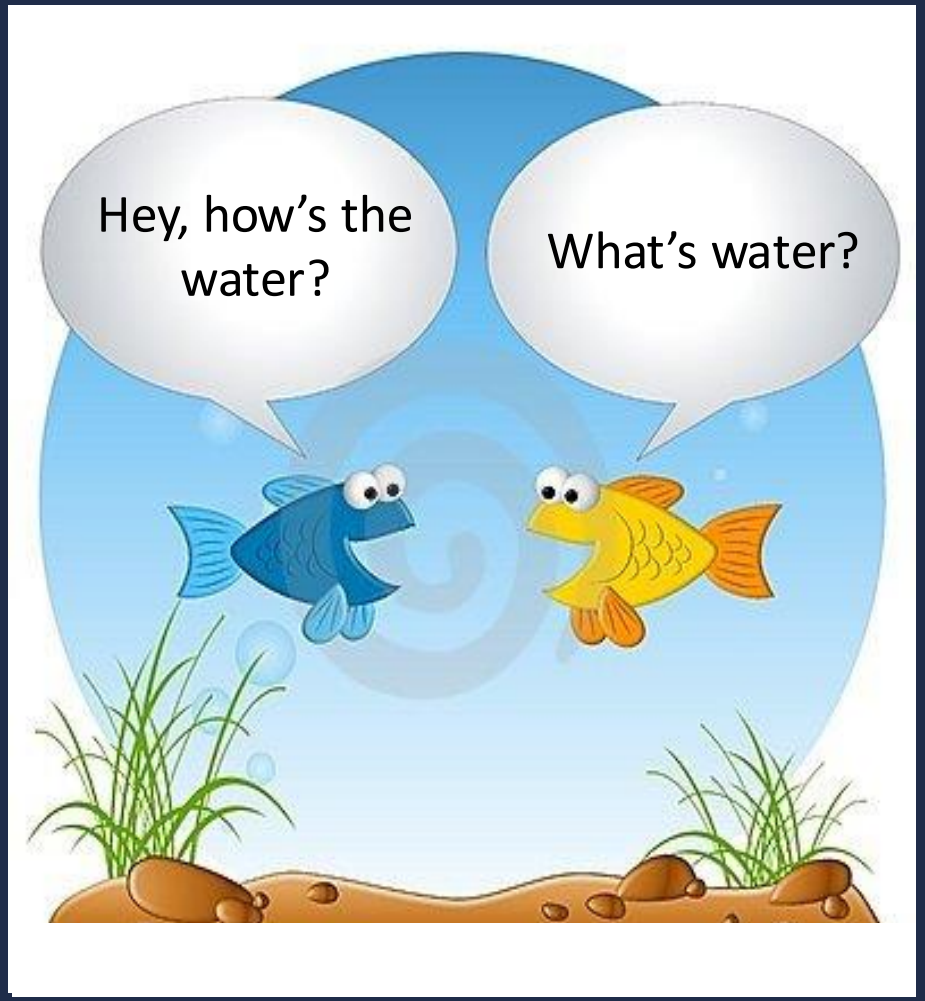
- Focus on trajectories of systems through time
- Prediction then takes a two-fold form
  - Identify the range of possible futures for the system, one of which of course is the future of much the same
  - Establish just what may lead to any one of the possible other futures in terms of changes in some aspect of the system itself and/or of the other systems with which it is intersected, in which it is nested, and which are nested within it



"The dichotomy of cause and effect is fallacious. Causes can be modified by reciprocal causality from effects. It is this circularity which is central. Human beings both form social relationships and are formed by them. This is absolutely correct and the reciprocal/recursive nature of causality in complex systems is an essential characteristic of such systems and their relationships." *David Byrne and Gill Callaghan*

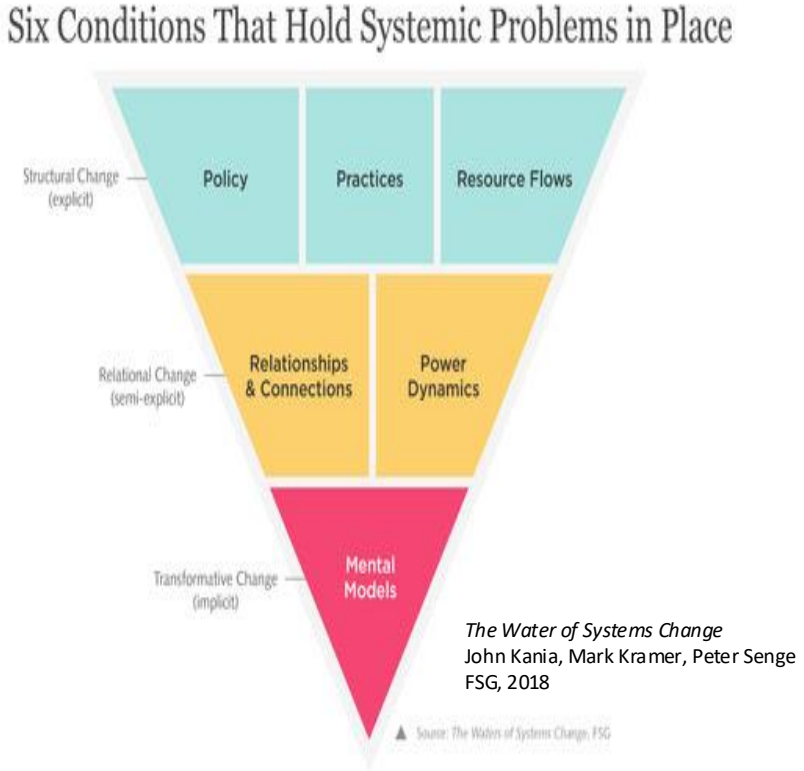
For complex adaptive systems, what is caused is the state of the system

- There is **no simple direction of causality** in complex systems; cause operates in any and all directions
- Interaction among elements is always what matters. That is the core of **emergence**
- The same system may be produced in **different ways**
- Time matters; **sequence and duration both have to be considered**
- The really interesting thing is **the informing of action** directed towards the achievement of futures



The idea is to focus on “shifting the conditions that are holding the problem in place”

From “The Water of Systems Change”

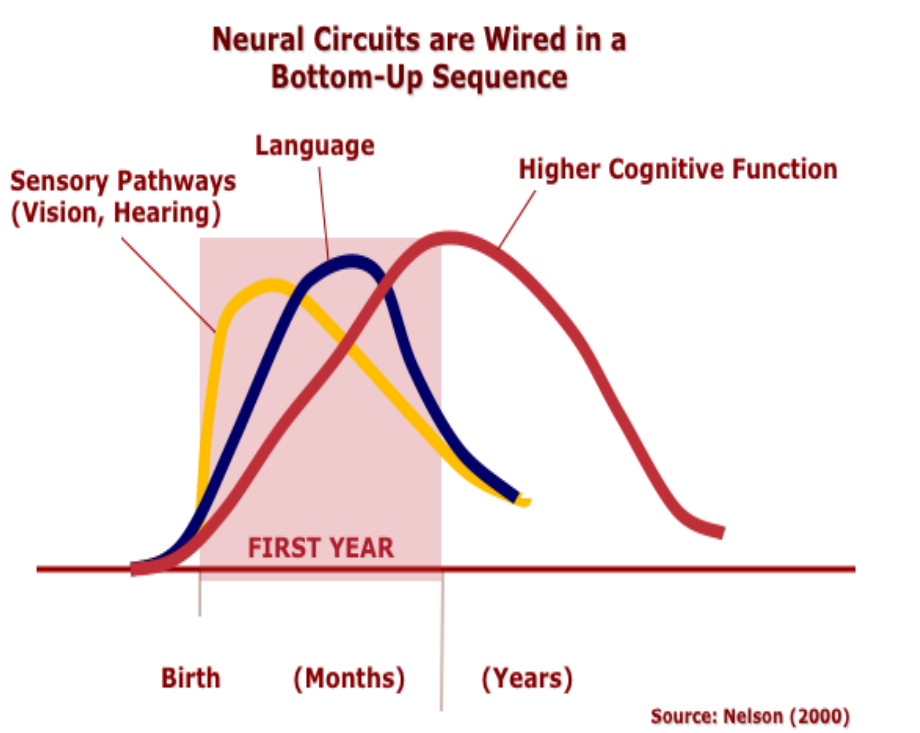


The Water of Systems Change
John Kania, Mark Kramer, Peter Senge
FSG, 2018

What are we doing wrong?

- Policies that are focused on delivering services in operating silos (e.g., education, housing, economic mobility, health, etc) rather than on transforming places
- Practices that (often unintentionally) undermine neighborhood health (e.g., school open enrollment, heavy-handed policing)
- Resourcing decisions that can be justified within a silo (closing schools or recreation centers) but that undermine neighborhood health
- Relationships and connections that disadvantage neighborhoods with limited civic infrastructure
- Power dynamics that have deliberately concentrated poverty and segregated neighborhoods
- Mental models that suggest that urban problems are inevitable, natural and ineradicable

We now know that exposure to sources of toxic stress impacts the neurological development of children



- Brains are wired in the **first years after birth**
- The critical period is the first year, when the neural circuits most closely associated with language development are generated

- All children will face adversity at some point in their lifetime and **dealing with that adversity is a critical part of child development**
  - Healthy environments offer "buffers" that protect the child from these adversities, ensuring that rises in stress levels are only temporary
- In distressed neighborhoods, **stress levels in children remain elevated for significant periods of time, triggering physiological responses that impede the healthy development of neural circuitry**

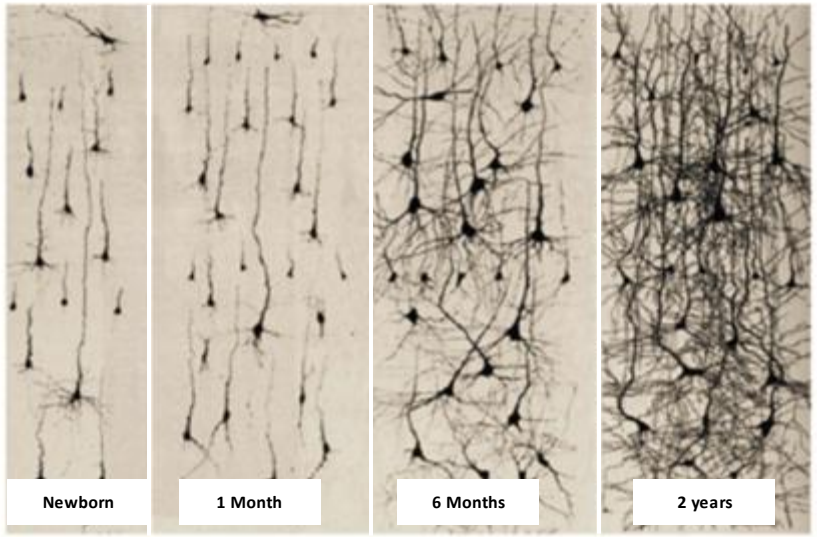
Sources of Toxic Stress

- Environmental risks associated with poor quality of housing and related infrastructure
- Family instability and lack of healthy familial and community networks
- Lack of quality early learning experiences
- High transiency rates
- Direct and indirect exposure to crime and violence
- Lack of access to quality food and nutrition

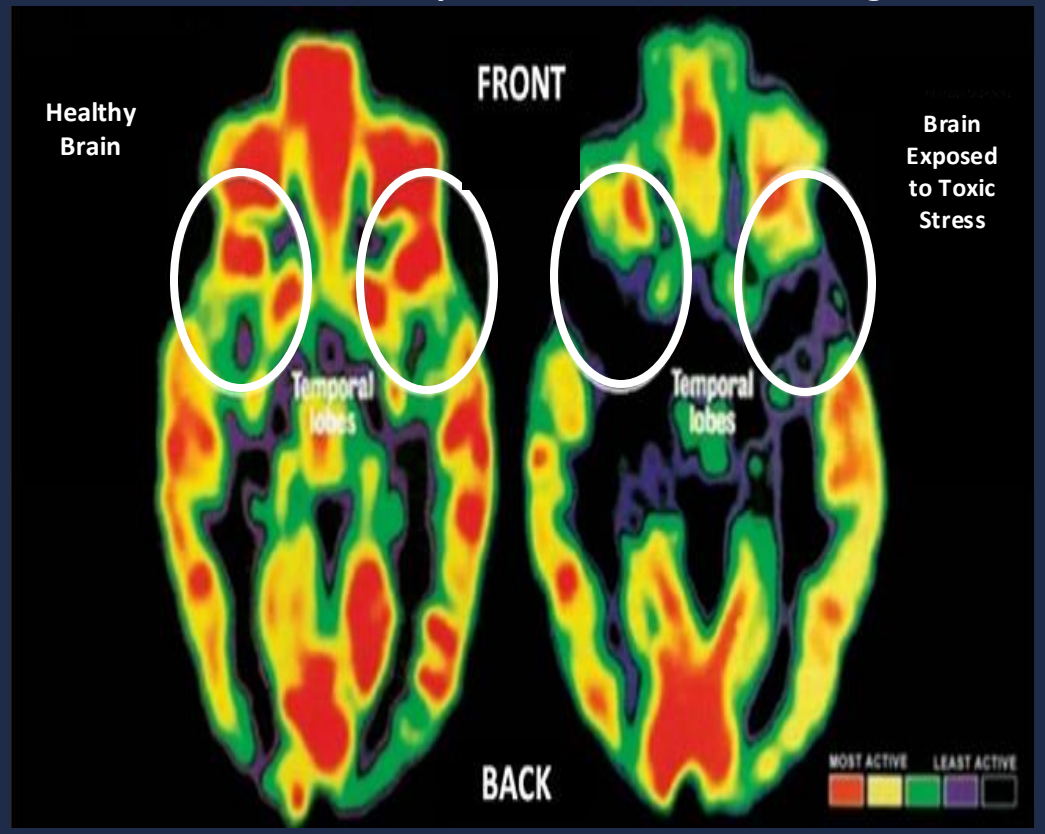
Brains of children exposed to sources of toxic stress do not generate neural pathways in a normal fashion

- By two years of age, **obvious gaps** in the neurological fabric of children have already developed
- This is **permanent damage**, and directly impacts the cognitive functioning of children, particularly with regard to **executive function, impulse control and future decision-making**

Growth of Neuronal Architecture From Birth to Age 2



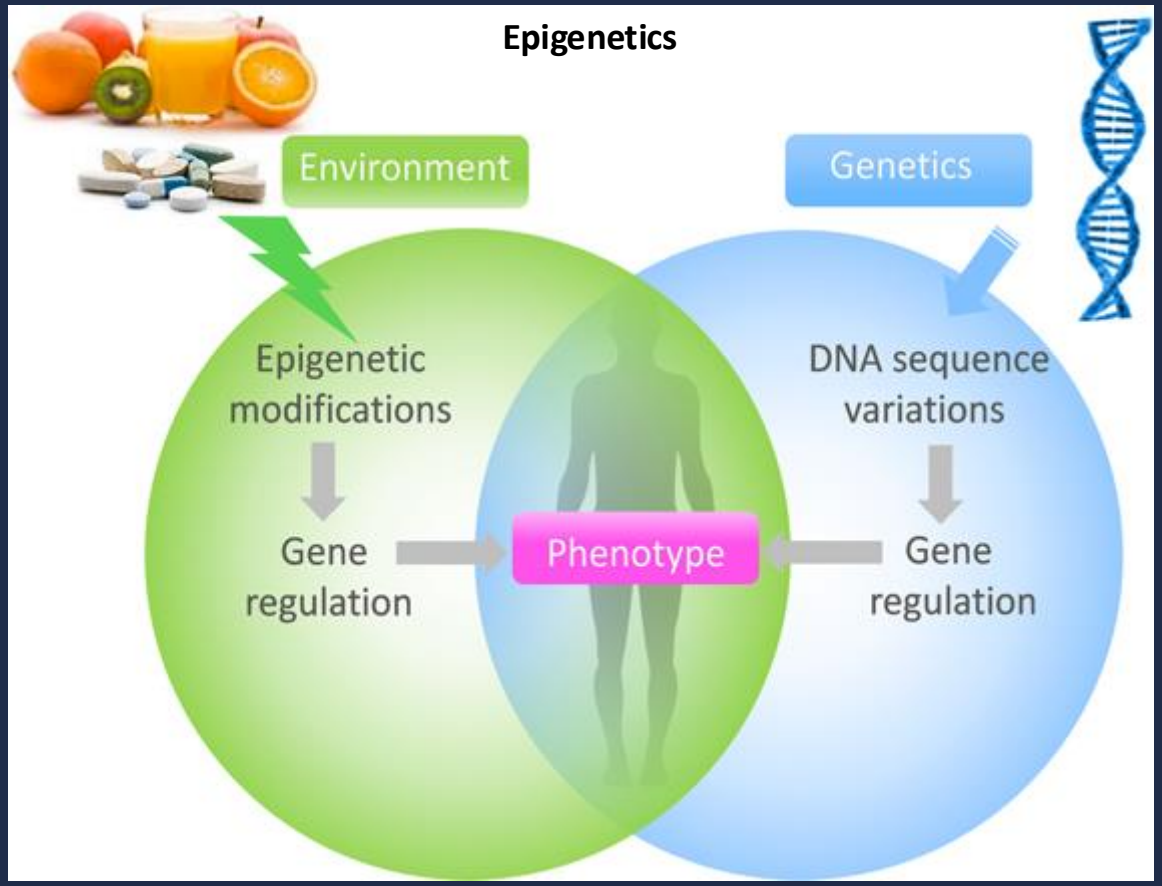
Brain Development at Two Years of Age



- Most of the formal interventions dedicated to preparing children for school don't start until a child is four years of age
  - What the science suggests is that **this is four years too late**

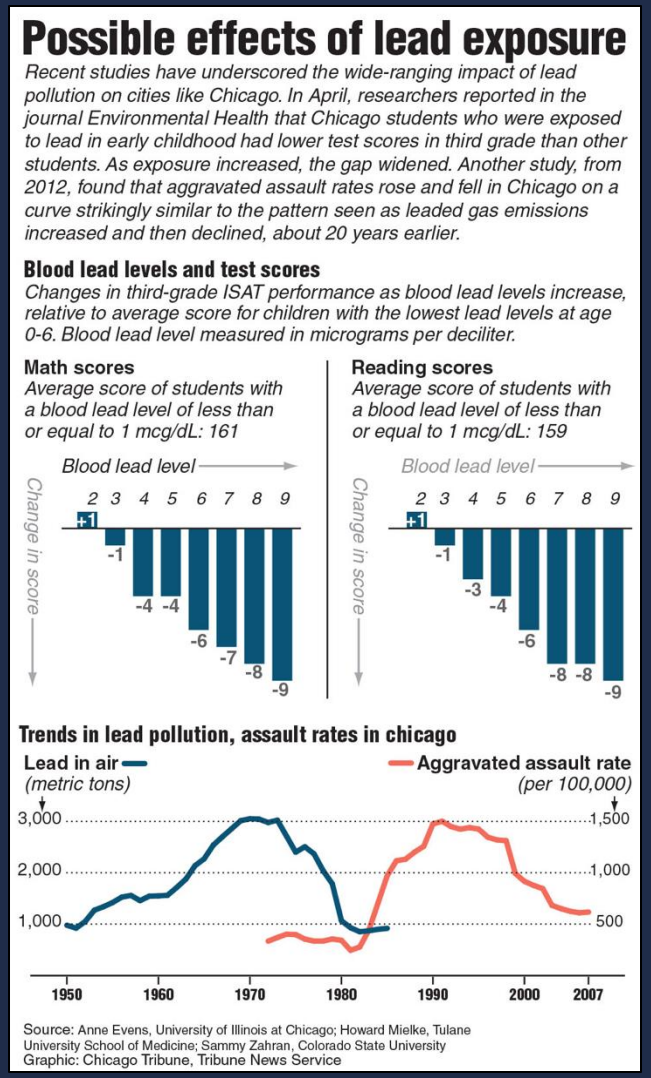
We know that how a child's genes are expressed is directly linked to the environment in which they are born and raised

- Epigenetics is the science of understanding how genes are expressed in response to the environment within which an organism develops
  - A **child's genetic endowment can be directly undermined by the physical and socio-economic conditions surrounding her**
  - Not only do sources of toxic stress impede healthy neurological and physiological development, but they also affect **how genes are being expressed which can undermine the genetic basis for, among others things, cognitive function**
  - Just because an individual was born, say, with a strong genetic basis for literacy or math or some other talent doesn't mean that those genes will be expressed if the environmental conditions are adverse in some way
- It is not simply the environment into which you are born that impacts the way in which your genes express themselves, it is the environment within which your parents were born (and their parents for that matter) that drive how your genes ultimately express themselves



Children exposed to toxic stress are at significant risk for psychological, social, academic, and physical challenges

- **Exposure to lead, for example, impacts education outcomes and crime rates**
  - 17% of Cleveland elementary school children have toxic levels of lead in their blood
- One study found **that children exposed to an incident of violent crime scored much lower on exams a week later**
- Another study focusing on Chicago in the 2000s considered children's exposure to neighborhood violence over time, finding that, after controlling for differences between students, **children living in more violent neighborhoods fall farther behind their peers in school as they grow older**
- Chetty and Hendren find that children who live in neighborhoods with higher crime rates for 20 years experience **significant reductions in income** as adults
- Neighborhoods of concentrated poverty and disadvantage can also create coercive sexual environments in which sexual harassment, molestation, exploitation, and violence against girls become accepted

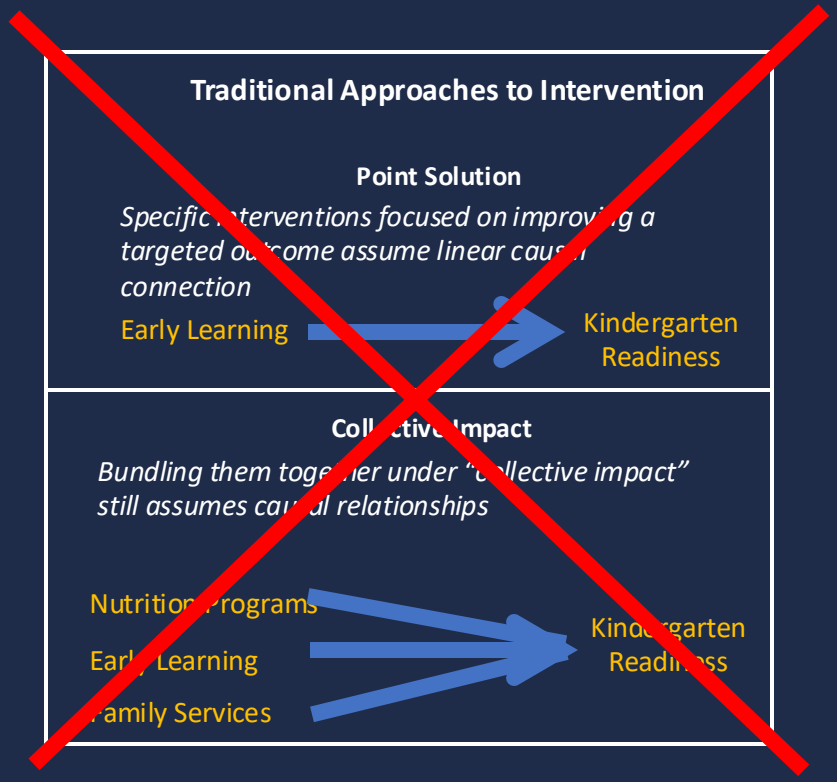


The way to do that is to look at the trajectory of the system itself

- Seek "retroductive" explanations; explanations for how the system arrived at its current state
- What is important is not the causal explanations for the details of that state, but the how that state can be characterized relative to other systems in its category
- The key is that there is a multiple but limited set of possible futures for the state of the system, and that the character of that set depends on the past history of the system
- The future is not chaotic, it is bounded by history

What matters is the state of the system, not relationships among variables abstracted from system

A third way of generating urban outcomes is what we need



To truly address root causes, we need to change the fundamental conditions – the systems – that "hold the problem in place"

Changes in control parameters and the introduction of attractors

Healthy, Self-Sustaining Neighborhoods

Education outcomes
Public Safety outcomes
Health outcomes
Economic outcomes

Jeff Smythe is the Executive Director for the Atlanta Regional Collaboration for Health Improvement (ARCHI)

archi

Atlanta Regional Collaborative for Health Improvement

- Jeff has nearly 30 years of nonprofit leadership in housing, homeless and hunger alleviation to aging services, from HIV services to international development, from refugee and foster family support to youth development and mental health
- ARCHI follows the collective impact framework which starts with the understanding that the only way to effectively address complex issues, like health disparities is to align the resources and expertise from multiple and diverse sectors in a multi-year commitment to create change.
- This means ARCHI is implementing a common agenda, creating shared measures to document progress, building alignments that create mutually reinforcing work, and forging the trust and relationships to sustain the work.