Neighborhood Adversity, Brain Development and Risk for Mental Health and Substance Use Challenges

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Causes of Mental Illness & Substance Abuse

- Genetics
- Environment
- Individual Factors

Subcategories:
- Abuse, Trauma, & Life Events
- Discrimination & Structural Adversity
- Childhood Poverty
- Neighborhood Adversity
Pathways of Early Adversity

Childhood Poverty

Neighborhood Adversity

Chronic Stress, Food and Housing Insecurity

Exposure to Crime and Violence

Environmental Toxins

Development of Brain Structure and Function

Risk for Mental Health and Substance Abuse Challenges
11,000+ Youth across the country
Neighborhood Deprivation, Brain and Cognition

**Hippocampal and Prefrontal Cortex Size**
Worse Memory
Worse Executive Function
Worse Reading
Worse Vocabulary Skills
Worse Processing Speed

**Neighborhood Deprivation**
- Median income
- % unemployed
- % below poverty line
- % with HS diploma
- % homeowner
- % single parent

*Controlling for family income, caretaker education, age, gender

Taylor & Barch (2020) JAMA Network Open
Neighborhood Deprivation, Brain and Cognition

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Barch et al (2021) Developmental Cog Neuro
Early Life Adversity and Biological Embedding (ELABE study)

Luby, Smyer, Warner, Rogers, & Barch
Precursor to Healthy Brain and Cognitive Development Study
N = 399 pregnant mom recruited and followed through pregnancy, offspring imaged at birth or shortly after, n = 280 infants with good imaging data and no prematurity and other issues

Trippet et al. (under review)
Violent Crimes

Property Crimes
**Violent Crimes**

Violent Crime and Amygdala-Thalamus Connectivity
Adj R² = 0.08, P = 0.005

**Property Crimes**

Property Crime and Thalamus-aDMN Connectivity
Adj R² = 0.1, P = 0.008

Brenner et al. (under review)
Take Home Messages

• Poverty and Neighborhood Adversity gets under the skin and into the brain for long lasting effects, increasing risk for mental health and substance abuse challenges

• Childhood poverty (family and neighborhood) is a public health crisis that must be solved
  – Strong evidence for causal effects
  – Relationships remain even accounting for genetics

• Highlights the huge need for early detection and intervention
  – Identify who is at risk
  – Connect people with care and treatment in more robust and sustaining ways

• Opportunities to develop interventions for mediating mechanisms
  – Chronic inflammation
  – Sleep disruption
  – Microbiome disruptions, gut-brain axis