The Importance of Early Childhood Experience

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Chapter One
Germ Theory

Health Care – 1850-2020

- 1900 – Medical Imaging
- 1929 – Penicillin
- 1950s – Kidney Transplants
- 1980s – Stem Cell Therapy/Bone Marrow
- 2000s – Antiviral Drugs
- 2000s – Immunotherapy
Chapter Two
The Road to Educational Success and Long-Term Health

Early Experience

- Early experience is the “smoking gun” for both education success and long-term health.
  - Things that happen early in life leave biological memories in your body.
  - “Gets under your skin”

Brain Architecture

- Major Stages of Brain Development
  - Neural tube formation
  - Cell proliferation
  - Cell differentiation
  - Cell migration
  - Cell connections
  - Synaptic pruning
  - Myelination
Synapse Formation

- Synapse formation peaks at the rate of 40,000 per second between 3 and 15 months of age.

The Brain Changes its Structure and Function in Response to Experience

- Plasticity
  - The brain is adaptable and can be influenced by positive experiences.
  - The brain is vulnerable and can be harmed by negative experiences.

Toxic Stress
The Body’s Response to Stress

• Increase in heart rate
• Increase in blood pressure
• Increase in breathing rate

Cortisol

• Suppresses the immune system
• Impairs memory/shrinks hippocampus
• Impairs selective attention
• Creates anxious behavior

If exposed to chronic stress, an elevated level of hormone production becomes “normal.”
The Brain Architecture of Anxiety and Fear

The Brain Architecture of Memory and Learning

Adverse Childhood Experiences
Prevalence of ACEs in Study Group

<table>
<thead>
<tr>
<th>ACE Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Abuse</td>
<td>28%</td>
</tr>
<tr>
<td>Substance Abuse</td>
<td>27%</td>
</tr>
<tr>
<td>Emotional Abuse</td>
<td>11%</td>
</tr>
<tr>
<td>Parental Divorce</td>
<td>23%</td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td>21%</td>
</tr>
<tr>
<td>Mental Illness</td>
<td>19%</td>
</tr>
<tr>
<td>Physical Neglect</td>
<td>10%</td>
</tr>
<tr>
<td>Incarcerated Family Member</td>
<td>5%</td>
</tr>
<tr>
<td>Emotional Neglect</td>
<td>15%</td>
</tr>
<tr>
<td>Mother Treated Violently</td>
<td>13%</td>
</tr>
</tbody>
</table>

Felitti et al., (1998)

• Correlated with increased risk of:
  • Heart disease
  • Chronic lung disease
  • Stroke
  • Diabetes
  • Cancer
  • Liver disease
  • Suicide
  • Injuries
  • HIV and STDs
  • School failure
  • Teen pregnancy
  • Criminality

Lifelong Trajectory of Increasing Risks

• ACE scores of 4 or higher
  – 2x as likely to have cancer
  – 7x as likely to be alcoholics
• ACE score > 6
  – 30x more likely to have attempted suicide
• ACE score > 6 (no drinking, smoking, or overweight)
  – 360% higher risk of heart disease
Many chronic diseases of adults are determined decades earlier, in childhood.

- Not by disease but by life experiences

Telomeres

- Sections of DNA at the end of each chromosome
Cortisol & Telomeres

- Increased cortisol exposure
- Reduced telomere length
- Higher risk for cardiovascular disease, stroke, cancer, cognitive decline, diabetes, obesity, and all-cause mortality

Successful Schools

Average Academic Achievement, by Grade

National Average

Grammar, 2017
NY Times – Upshot 12/5/17

5 Year Academic Growth

Example – Expected Academic Achievement
With One Additional Year of Achievement Growth

58%


With Two Additional Years of Achievement Growth

77%


With Three Additional Years of Achievement Growth

90%

Chapter Three
It is Time to Innovate

Education – 1850-2020

• 1880s – Germs cause disease
• 1900 – Medical Imaging
• 1929 – Penicillin
• 1950s – Kidney Transplants
• 1980s – Stem Cell Therapy/Bone Marrow
• 2000s – Antiviral Drugs
• 2000s – Immunotherapy

Health Care – 1850-2020
### Education – 1850-2020

- 1946 – National School Lunch Act
- 1954 – Brown vs. Board of Education
- 1965 – Elementary and Secondary Education Act
- 1975 – Education for All Handicapped Children Act
- 1990 – Individual with Disabilities Education Act
- 2002 – No Child Left Behind Act
- 2015 – Every Student Succeeds Act

### Education – 2020 – The Big Question

If you were building the system today, would you start at age 5???

### Closing Thoughts

- Invest in in early experience, not just early education
  - Risk stays with you your entire life
  - Be comprehensive (0-5)
- Need to build from prenatal/birth up
  - Not from K-12 down
**Policy Implications**

- Home visiting programs
- Universal pre-K (3 and/or 4 year-olds)
- Quality vs. Quantity Child Care
- Expanded subsidies and tax credits for ECE
- Intensive focus on 0-3 (Early Head Start)
- Pay parity between Child Care and Schools
- Infant mental health services
- Paid parental leave

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**Policy and Program Opportunity**

- 1,100 Days
Thank You

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