What Happens in Early Childhood Matters for a Lifetime

What the science of early childhood development and toxic stress tells us and why it gives us hope
Life Course of Health Development

Lu and Halfon, 2003
Structural Brain Changes due to Early Experiences

“The Two Year Window”
Birth – 2 years; critical window for hardwiring the brain for social-emotional development.

- Social-Emotional development is based on secure attachment and becomes the foundation for cognitive development and sense of self-identity.
- Attachment comes from a nurturing relationship with a caregiver that is consistent and caring.
Building Social-Emotional Skills

We are not born with the skills that enable us to make plans, control impulses, and stay focused. We are born with the potential to develop these capacities...

Nurturing and stable relationships with caring adults are essential to healthy human development. Early, secure attachments contribute to the growth of a broad range of competencies, including love of learning, sense of one’s self, positive social skills, successful relationships at later ages, and an understanding of emotions, commitment, morality, and other aspects of human relationships.”

Emotional well-being and social competence provide a strong foundation for emerging cognitive abilities, and together they are the bricks and mortar the comprise the foundation of human development.

The emotional and physical health, social skills, and cognitive-linguistic abilities that emerge in the early years are all important pre-requisites for success in school and later in the workplace and community.”

Harvard Center for the Developing Child
The Plasticity of Brain Architecture

Decreases Over Time

• Brain circuits consolidate with increasing age, making them more difficult to rewire.

• The timetable of brain plasticity varies: it is narrow for basic sensory abilities, wider for language, and broadest for cognitive and social-emotional skills.

• Early plasticity makes the young brain both more vulnerable to harm and more capable of recovery.

• At all ages it is more efficient – biologically and economically – to prevent later difficulty than to try to remedy problems that emerge.
Life Course of Health Development

Lu and Halfon, 2003
Life Course Health Development - Environmental interaction and Disparities

- Poor Nutrition
- Stress
- Abuse
- Tobacco, Alcohol, Drugs
- Poverty
- Lack of Access to Health Care
- Exposure to Toxins

Puberty
Pregnancy
Adverse Childhood Experiences (ACE Study)

- Public/Private Partnership
- Started in 1985 – Ongoing
- 1995 CDC Partnership - Ongoing
- Largest of kind – 17,000

Changed Nation's Views on Children's Behavioral Health

Dr. Vincent J. Felitti, MD
Internist, Kaiser Permanente

Dr. Robert F. Anda MD (plus MS in Epidemiology)
Centers for Disease Control (CDC) & Prevention
The Adverse Childhood Experiences

When you were growing up, during your first 18 years of life, did you experience:

• Physical abuse
• Emotional abuse
• Sexual abuse
• Domestic violence
• Substance abuse in home
• Mental illness in parent
• Lost parent due to separation or divorce
• Household member in jail
Adverse Childhood Experiences (ACE) Score

Number of individual adverse childhood experiences were summed......

<table>
<thead>
<tr>
<th>ACE score</th>
<th>Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>36.4%</td>
</tr>
<tr>
<td>1</td>
<td>26.2%</td>
</tr>
<tr>
<td>2</td>
<td>15.8%</td>
</tr>
<tr>
<td>3</td>
<td>9.5%</td>
</tr>
<tr>
<td>4</td>
<td>6.0%</td>
</tr>
<tr>
<td>5</td>
<td>3.5%</td>
</tr>
<tr>
<td>6</td>
<td>1.6%</td>
</tr>
<tr>
<td>7 or more</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

64% reported experiencing one or more
37% reported experiencing two or more
ACEs Influence Multiple Outcomes

Smoking
Alcoholism
Promiscuity
High Perceived Risk of HIV

Risk Factors for Common Diseases

High Perceived Stress
Smoking
Alcoholism
Promiscuity

General Health and Social Functioning

Married to an Alcoholic
Difficulty in job performance

Mental Health

Depression
Sleep Disturbances
Memory Disturbances
Depression
Anxiety
Panic Reactions
Poor Anger Control

Sexual Health

Teen Paternity Fetal Death
Unintended Pregnancy
Early Age of First Intercourse

Prevalent Diseases

Cancer Liver Disease
Skeletal Fractures
Chronic Lung Disease
Ischemic Heart Disease

Sexually Transmitted Diseases

Multiple Somatic Symptoms
Obesity
Illicit Drugs
IV Drugs
Adverse Childhood Experiences and Adolescent Pregnancy

Percent who had a teen pregnancy

ACE Score

Slide from Dr. Robert Anda
ACE Score and Intravenous Drug Use

% Have Injected Drugs

ACE Score

N = 8,022  p<0.001
Seeking to Cope

- The risk factors/behaviors underlying these adult diseases are actually effective coping devices.

- What is viewed as a problem by the health care provider is actually a solution to bad experiences for the patient.

- Dismissing these coping devices as “bad habits” or “self-destructive behavior” misses their source of origin.
Mental Health Problems
Adverse Childhood Experiences
And Chronic Depression as an Adult

% With a Lifetime History of Depression
ACE Score
Women
Men

0 1 2 3  >=4

ACE Score
0 10 20 30 40 50 60 70 80

% With a Lifetime History of Depression

Red: Women
Yellow: Men
Adult Disease and Disability
Higher ACE Score = significant rise in chronic health conditions:

- Obesity
- Sexually Transmitted Disease
- Liver Disease
- COPD
- Ischemic Heart Disease
- Autoimmune Disease
- Lung Cancer
Serious Social Problems
ACE Score and Indicators of Impaired Worker Performance

ACE Score

0 1 2 3 4 or more

Prevalence of Impaired Performance (%)

Absenteism (>2 days/month)
Serious Financial Problems
Serious Job Problems
ADVERSE CHILDHOOD EXPERIENCES AND ADULT DISEASE:

- 54% of depression
- 58% of suicide attempts
- 39% of ever smoking
- 26% of current smoking
- 65% of alcoholism
- 50% of drug abuse
- 78% of IV drug abuse
- 48% of promiscuity (>50 partners)

are attributable to ACE’s.

Dr. V. Felitti. 2011
The ACE Study is evidence that....

ADVERSE CHILDHOOD EXPERIENCES are the most basic and long lasting cause of: health risk behaviors, mental illness, social malfunction, disease, disability, death, and healthcare costs

Dr. V. Felitti. 2011
Prevalence Of Children Ages 0-17, By State, Who Experienced Two Or More Of The Nine Adverse Childhood Experiences Evaluated In The 2011-12 National Survey Of Children’s Health

SOURCE Authors’ analysis of data from the 2011–12 National Survey of Children’s Health. NOTES The map shows prevalence in each state compared to the US average. In the key, lower indicates better performance. Nationwide, 22.6 percent of children experienced two or more of the nine adverse childhood experiences. The state with the lowest percentage of such children (16.3 percent) was New Jersey; the state with the highest percentage (32.9 percent) was Oklahoma. Statistical significance indicates $p < 0.05$. 

![Map showing prevalence of children experiencing two or more adverse childhood experiences by state.](image)
### National and Kentucky Prevalence of Adverse Childhood Experiences Among Children Age 0-17

<table>
<thead>
<tr>
<th>Adverse Child or Family Experiences</th>
<th>Kentucky Prevalence</th>
<th>National Prevalence</th>
<th>State Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child had ≥ 1 Adverse Child/Family Experience</td>
<td>55.3%</td>
<td>47.9%</td>
<td>40.6% (CT) – 57.5% (AZ)</td>
</tr>
<tr>
<td>Child had ≥ 2 Adverse Child/Family Experiences</td>
<td>30.0%</td>
<td>22.6%</td>
<td>16.3% (NJ) – 32.9% (OK)</td>
</tr>
<tr>
<td>Extreme economic hardship</td>
<td>29.6%</td>
<td>25.7%</td>
<td>20.1% (MD) – 34.3% (AZ)</td>
</tr>
<tr>
<td>Family discord leading to divorce or separation</td>
<td>28.9%</td>
<td>20.1%</td>
<td>15.2% (DC) – 29.5% (OK)</td>
</tr>
<tr>
<td>Having lived with someone who had an alcohol or drug problem</td>
<td>14.4%</td>
<td>10.7%</td>
<td>6.4% (NY) – 18.5% (MT)</td>
</tr>
<tr>
<td>Having been a victim or witness of neighborhood violence</td>
<td>9.3%</td>
<td>8.6%</td>
<td>5.2% (NJ) – 16.6% (DC)</td>
</tr>
<tr>
<td>Having lived with someone who was mentally ill or suicidal</td>
<td>11.1%</td>
<td>8.6%</td>
<td>5.4% (CA) – 14.1% (MT)</td>
</tr>
<tr>
<td>Witnessing domestic violence in the home</td>
<td>9.7%</td>
<td>7.3%</td>
<td>5.0% (CT) – 11.1% (OK)</td>
</tr>
<tr>
<td>Parent served time in jail</td>
<td>13.2%</td>
<td>6.9%</td>
<td>3.2% (NJ) – 13.2% (KY)</td>
</tr>
<tr>
<td>Treated or judged unfairly due to race/ethnicity</td>
<td>3.7%</td>
<td>4.1%</td>
<td>1.8% (VT) – 6.5% (AZ)</td>
</tr>
<tr>
<td>Death of parent</td>
<td>4.2%</td>
<td>3.1%</td>
<td>1.4% (CT) – 7.1% (DC)</td>
</tr>
</tbody>
</table>

Source: 2011/2012 National Survey of Children's Health
Available at [http://www.childhealthdata.org/home](http://www.childhealthdata.org/home)
Science Tells Us that Early Life Experiences Are Built Into Our Bodies

Research on the biology of stress illustrates how threat raises heart rate, blood pressure, and stress hormone levels, which can impair brain architecture, immune status, metabolic systems, and cardiovascular function.
Three Levels of Stress

Positive
Brief increases in heart rate, mild elevations in stress hormone levels.

Tolerable
Serious, temporary stress responses, buffered by supportive relationships.

Toxic
Prolonged activation of stress response systems in the absence of protective relationships.
Allostasis:
Maintain Stability through Change

Allostastic Load

The Brain Architecture of Anxiety and Fear
The Brain Architecture of Memory and Learning
Cognitive, Emotional, and Social Capacities Are Inextricably Intertwined Within the Architecture of the Brain
Teens 'more likely to engage in risky sex' if they have weak working memory

Individual differences in working memory may predict early sexual activity and unprotected sex during adolescence, according to a study of impulse control and risky sexual behavior among 12-15-year-olds.

Previous studies have found that adolescents who have problems regulating impulse control are more likely to engage in risky sexual behavior, putting them at increased risk for sexually transmitted diseases and unintended pregnancies.

In the new study - published in *Child Development* - researchers
Life Course Trajectory: A Balance of Risk and Protective Factors

Protective Factors
- Child
- Family
- Community
- School

Risk Factors
- Child
- Family
- Community
- School

Outcome
- Positive resilience
- School Readiness

- Negative vulnerability
- Child Abuse

+ Family Skills and Support -
Life Course Trajectory: A Balance of Risk and Protective Factors

Secure Relationships
- Strong social-emotional pathways
- Cognition, problem solving
- Trusting relationships with caring adults
- Ability to explore their environment without fear; curiosity
- Tolerate disappointments
- Stay on task, persevere
- Able to form close friendships, networks of support

Poor Relationships
- Poor coping & problem solving skills
- Failure to thrive > Chronic illness
- Learning delays / Devel. delay
- Behavior problems
- Speech/Language delays
- Alienation, Inability to form relationships
- Lack of trust, compassion, remorse
- Aggression, Violence, Anti-social behavior
- Eating disorders
- Misdiagnosed as bipolar / severe depression

HARDWIRING OF THE BRAIN for Social-emotional fxn

ATTACHMENT
**Life Course Trajectory:**
A Balance of Risk and Protective Factors

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**Executive Function**
- Ability to problem solve
- Self-control
- Self confidence
- Able to calm self
- Follows directions
- Persists on task
- Able to manage their tempers when provoked
- Able to delay gratification
- Able to plan

**Responses to chronic/toxic stress**

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**“Amygdala Hijack”**
- Impaired memory, esp. “working” and contextual memory
- Inability to concentrate
- Harder to follow directions
- Hard to sit still
- Constantly on edge
- Easily provoked
- Impulsive
This growing scientific understanding into causal mechanisms that link early adversity into later impairments in learning, behavior, and both physical and mental well-being are potentially TRANSFORMATIONAL.

Toxic stress in young children can lead to less outwardly visible yet permanent changes in brain structure and function.

Altered brain architecture in response to toxic stress in early childhood could explain, at least in part, the strong association between early adverse experiences and subsequent problems in the development of linguistic, cognitive, and social-emotional skills, all of which are inextricably intertwined in the wiring of the developing brain.
Adverse Childhood Experiences Create Toxic Stress that Influences Developing Brain Architecture

Research on the biology of stress responding shows that chronic, severe, and/or uncontrollable stressful experiences disrupt developing brain architecture and can lead to stress management systems that respond at lower thresholds.

- The availability of a **caring and responsive adult** greatly reduces the risk that circumstances will lead to excessive activation of stress response systems that lead to physiologic harm and long-term consequences for health and learning.
Ways to Make a Difference

1. Build caring relationships
   “The same neuroplasticity of the brain that leaves the pathways vulnerable to stress, also enables their facilitation during sensitive developmental periods.”

2. Support parents by improving their skills.
   “Interventions and services that enhance the mental health, executive function, and self-regulation of vulnerable mothers suggest promising strategies to protect their children’s developing brains.”

3. Support professionals by improving their skills.
   “Large numbers of vulnerable children with highly stressed staff are engaged in dysregulatory interactions that may compromise learning and the ability to manage routines.”
Washington State determined that 13 out of every 30 students will have toxic stress from 3 or more traumatic experiences.
Trauma-Sensitive Schools- Trauma-informed classrooms (Compassionate Schools)

• “It all boils down to this: Kids who are experiencing the toxic stress of severe and chronic trauma just can’t learn. It’s physiologically impossible.”

• In trauma-sensitive schools, teachers don’t punish a kid for “bad” behavior— they don’t want to traumatize an already traumatized child. They did deeper to help a child feel safe. Once a child feels safe, she or he can move out of stress mode, and learn again.

• Children with toxic stress live much of their lives in fight, flight, or fright (freeze) mode. They respond to the world as a place of constant danger. With their brains overloaded with stress hormones and unable to function appropriately, they can’t focus on school work. They fall behind in school or fail to develop healthy relationships with peers.
The Protective Factors Approach

- Benefits ALL families –
  - All families go thru times of stress and should be able to ask for help without stigma
  - Every parent should feel supported by their community in their efforts to be a good parent
- Builds on family strengths, buffers risk, and promotes better outcomes
- Can be implemented through small but significant changes in everyday actions
- Builds on and can become part of existing programs, strategies, systems and community opportunities
- Is grounded in research, practice and implementation knowledge
- Creates a common language and approach among agencies so that communities can meet the diverse needs of their families
What Are the Six Protective Factors?

1. Parental Resilience
   “Families are strong and can cope in good times and bad”

2. Social Connection
   “Families have people they can count on”

3. Knowledge of Child Development
   “Families help their children grow and learn”

4. Concrete Support in Times of Need
   “Families get the help they need from caring communities”

5. Social and Emotional Competence of Children
   “Families help their children manage feelings and relationships”

6. Nurturing & Attachment
   “Families create secure bonds with their children”
SERVICES IN PERSPECTIVE

Community

Education and Care

Physical Health
- Primary healthcare
- Health promotion activities

Targeted Special Needs Programs
- Screening and assessment
- Early intervention services

Family Resource Centers
- Parent/child activities
- Support groups
- Parent ed.

Children’s Mental Health
- Mental health consultation
- Counseling

Domestic Violence
- Safety planning
- Shelter
- Counseling

Families & Protective Factors
- Assessment
- Safety planning
- Substance abuse treatment

Home Visiting Programs
- Home visits
- Group activities

Child Welfare

Education
- Counseling

Screening
- Shelter
- Counseling

Safety planning
- Counseling

Strengthening families & Protective Factors Framework
THE PARADIGM SHIFT FOR FAMILY SUPPORT

- “At risk” families → All families
- Risk factors → Protective factors/buffers for toxic stress
- Deficit based → Strengths Based
- Family inadequacies → Skill building
- Prevention → promoting strong families and healthy development
Decades of Science from Many Disciplines All Point to the Same Conclusion

The healthy development of children provides a strong foundation for
- healthy and competent adulthood,
- responsible citizenship,
- economic productivity,
- strong communities, and
- a sustainable society.