It is impossible to understand the adults we become unless we understand the children we have been.

Scientists now know a major ingredient in this developmental process is the “serve and return” relationship between children and their parents and other caregivers.

Brains are built over time, from the bottom up and keep developing until around age 25-20.

In infancy, 700 new neural connections are formed every second.

Pruning follows rapid proliferation so that brain circuits become more efficient.
5/22/2016

THE BRAIN DEVELOPS

WHAT GETS CONNECTED AND WHAT GETS PRUNED AWAY DETERMINED LARGELY BY CHILD’S ENVIRONMENT

ATTACHMENT DETERMINES COMPLEX FUNCTION

COMPLEX FUNCTION DETERMINES INTERACTION WITH THE WORLD

Biological Regulation

Moral Development

Emotional Development

Social Development

Cognitive Development

THE FRONTAL LOBES

Last to develop, longest to develop – mid-20s

Allow us to use this information to modulate and guide our interactions with those around us

Governs moral reasoning, judgment

STRESS ADVERSITY TRAIN

THE POISON IN OUR LIVES

Areas of the body affected by stress

- Brain and nervous system
- Muscles and joints
- Heart
- Lungs
- Pancreas
- Intestines
- Digestive system

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The wear-and-tear on the body and brain resulting from chronic over-activity of physiological systems that are normally involved in adaptation to environmental challenge.

**ALLOSTATIC LOAD = RELENTLESS STRESS**

**RELENTLESS STRESS**
- Poverty
- Racism and other forms of discrimination
- Parenting alone
- Multigenerational caregiving
- Multiply challenged children
- Severe injury/illness in primary caregiver or any close family member

**INCREASED ALLOSTATIC LOAD = INCREASED STRESS**
- Irritability
- Impatience
- Depression
- Shame
- Poor quality decisions
- Substance abuse
- Violence
- Impaired parenting
- Intergenerational transmission

**RELENTLESS STRESS IN PARENTS**

MAY LEAD TO TOXIC STRESS IN CHILD

**TOXIC STRESS**
- Strong and prolonged activation of the body's stress management systems
- Particularly problematic during critical developmental periods
- Effects basic brain architecture
The Relationship of Adverse Childhood Experiences to Adult Health Status

A collaborative effort of Kaiser Permanente and The Centers for Disease Control

Vincent J. Fildes, M.D.
Robert Anda, M.D.

In 1998, largest study of its kind ever (almost 18,000 participants)
Examined the health and social effects of adverse childhood experiences over the lifespan
Majority of participants were 50 or older (62%), were white (77%) and had attended college (72%)

The ACE Score is used to assess the total amount of stress during childhood and has demonstrated that as the number of ACE increase, the risk for the following health problems increases in a strong and graded fashion:

- Alcoholism and alcohol abuse
- COPD
- Depression
- Fetal death
- Health-related quality of life
- Illicit drug use
- HEART DISEASE
- Liver disease
- Autoimmune disease
- Obesity

- Intimate partner violence
- Multiple sexual partners
- STDs
- Smoking
- Suicide attempts
- Unintended pregnancy
- Early smoking
- Adolescent pregnancy
- Cancer
- Stroke

1 POINT CATEGORY – ADD TO GET TOTAL ACE SCORE

Twice as likely to smoke
Seven times more likely to be alcoholics
Six times more likely to have had sex before the age of 15
Twice as likely to have been diagnosed with cancer
Twice as likely to have heart disease
Four times as likely to suffer from emphysema or chronic bronchitis
Twelve times as likely to have attempted suicide
Ten times more likely to have injected street drugs
The Philadelphia ACE Study

A collaborative, originally led by the Institute for Safe Families (ISF) and now by Health Federation, to develop and implement research, practice, and policies in urban pediatric settings based on the Adverse Childhood Experiences (ACE) study.

Philadelphia ACE Study Questions

<table>
<thead>
<tr>
<th>Conventional ACEs</th>
<th>Expanded ACEs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical Abuse</td>
<td>Witnessing Violence</td>
</tr>
<tr>
<td>Emotional Abuse</td>
<td>Living in Unsafe Neighborhoods</td>
</tr>
<tr>
<td>Sexual Abuse</td>
<td>Experiencing Racism</td>
</tr>
<tr>
<td>Emotional Neglect</td>
<td>Living in Foster Care</td>
</tr>
<tr>
<td>Physical Neglect</td>
<td>Experiencing Bullying</td>
</tr>
<tr>
<td>Domestic Violence</td>
<td></td>
</tr>
<tr>
<td>Household Substance Abuse</td>
<td></td>
</tr>
<tr>
<td>Incarcerated Care Provider</td>
<td></td>
</tr>
<tr>
<td>Mental Illness in the Home</td>
<td></td>
</tr>
</tbody>
</table>

Philadelphia ACE Study Population is not Representative of Urban Populations

(R. Wade, M.D. 2015)

<table>
<thead>
<tr>
<th>Demographics</th>
<th>ACE Study</th>
<th>Philadelphia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>56</td>
<td>34</td>
</tr>
<tr>
<td>Race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>79% White</td>
<td>79%</td>
<td>41%</td>
</tr>
<tr>
<td>5% African American</td>
<td>5%</td>
<td>43% African American</td>
</tr>
<tr>
<td>5% Hispanic</td>
<td>5%</td>
<td>12% Hispanic</td>
</tr>
<tr>
<td>High school graduates</td>
<td>94%</td>
<td>36%</td>
</tr>
<tr>
<td>College graduates</td>
<td>43%</td>
<td>13%</td>
</tr>
<tr>
<td>Percent below FPL</td>
<td>Not measured</td>
<td>25%</td>
</tr>
</tbody>
</table>

Many of the Traditional ACEs are More Prevalent in an Urban Setting

(R. Wade, 2015)

<table>
<thead>
<tr>
<th>Philadelphia ACE Study (N = 1,784)</th>
<th>Kaiser ACE Study (N = 17,337)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional abuse</td>
<td>33.2%</td>
</tr>
<tr>
<td>Physical abuse</td>
<td>35.0%</td>
</tr>
<tr>
<td>Sexual abuse</td>
<td>16.2%</td>
</tr>
<tr>
<td>Physical neglect</td>
<td>19.1%</td>
</tr>
<tr>
<td>Emotional neglect</td>
<td>7.7%</td>
</tr>
<tr>
<td>Substance abusing household member</td>
<td>34.8%</td>
</tr>
<tr>
<td>Mentally ill household member</td>
<td>24.1%</td>
</tr>
<tr>
<td>Witnessed domestic violence</td>
<td>17.9%</td>
</tr>
<tr>
<td>Household member in prison</td>
<td>12.9%</td>
</tr>
</tbody>
</table>

Overlap Between Exposure to Conventional and Expanded ACEs

(R. Wade, M.D. 2015)

<table>
<thead>
<tr>
<th>No ACEs</th>
<th>&gt; 1 Conventional ACE</th>
<th>&gt; 1 Expanded ACE</th>
<th>&gt; 1 Conventional ACE &amp; &gt; 1 Expanded ACE</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.2%</td>
<td>30.0%</td>
<td>46.5%</td>
<td>13.9%</td>
</tr>
</tbody>
</table>

Total ACE Score > 4 by Zip Code

Health Statistics from these 5 Zip Codes
- 22% of adults unemployed
- 46% of residents live in poverty
- Life expectancy for males age 68
- 22% of children obese
- Homicide rate 30 to 40 deaths per 100,000
WHEN LIFE IS A WARZONE: 
WHAT MAKES STRESS SO TOXIC

ITS ALL ABOUT THE BRAIN

Fear simultaneously initiates two information-processing systems: the “low road” and the “high road” (LeDoux, 1996).

Epinephrine (adrenalin)

AWARENESS
- Integrated Experience
- Can be recalled
- Weathering of memory

EMOTION

SENSATION

BEHAVIOR

LOW ROAD AND THE HIGH ROAD

THE HUMAN STRESS RESPONSE
THE PROBLEM WITH EXTREME STRESS:

Progressively diminished cognitive and physical performance as heart rate increases

HEART RATE AND FEAR

<table>
<thead>
<tr>
<th>Heart Rate</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-80 bpm</td>
<td>Normal Resting heart rate.</td>
</tr>
<tr>
<td>80-115 bpm</td>
<td>Fine motor skills start to deteriorate</td>
</tr>
<tr>
<td>115-145 bpm</td>
<td>Complex motor skills deteriorate. Increased cognitive function and reaction time.</td>
</tr>
<tr>
<td>145-175 bpm</td>
<td>Cognitive processing deteriorates, loss of peripheral vision, loss of depth perception, loss of near vision, auditory exclusion</td>
</tr>
<tr>
<td>&gt;175 bpm</td>
<td>Irrational fight, fight, or freeze, submissive behaviour, voiding of bowels</td>
</tr>
</tbody>
</table>

HEART RATE AND FEAR

Epinephrine (adrenalin)  
Cortisol  
Endorphins

THE HUMAN STRESS RESPONSE

Epinephrine  
Child's Brain  
Cortisol  
Endorphins

LOSS OF INTEGRATION: INTERRUPTION IN BIOGRAPHICAL NARRATIVE AND TIME

Knowledge  
Behavior  
Emotions  
Sensation  
MEMORY

One name for the Devil is "Diabolos" which means the divider, the splitter-into-fragments.  
Robin Skynner, Life and How to Survive It

ALL TRAUMA IS PREVERBAL  
B. A. van der Kolk, The Body Keeps the Score
State of high alert
Inability to think clearly
Extreme thoughts
Attention to threat
Intense and prolonged anxiety
Driven to take action
“Hair trigger” tempers
Aggression
Friends, teachers, other adults

- Addiction
- Substance use
- Anxiety, phobias, Agoraphobia
- Avoidance of triggers
- Pain as a distraction
- Depression, suicidality
- Avoidance of grief
- Risky behavior
- Addiction to trauma
- Controlling behavior
- Alienation from others
- Dissociation
- Reenactment, revictimization
- Empowerment through violence
- Criminal, antisocial behavior

Those who cannot remember the past are condemned to repeat it (p284), George Santayana, 1905, The Life of Reason: Or, The Phases of Human Progress.
When a person’s life becomes fundamentally and unconsciously organized around the impact of chronic and toxic stress, even when this undermines their adaptive ability.

An interconnected, complex, adaptive, living world

FILLED WITH PEOPLE WHO HAVE HAD ADVERSE INDIVIDUAL, GROUP AND INTERGENERATIONAL TRAUMA AND ADVERSITY

CHANGING THE FUNDAMENTAL QUESTION

It’s not “What’s wrong with you?”
It’s “What happened to you?”

Foderaro, 1991; Bloom, 1994

Tasks of Recovery

Chronic Stress:
- Biological stabilization
Basic Safety and Trust:
- Safety skills with supportive people
Loss of Emotional Management:
- Emotional management skills
Miscommunication and Alexithymia:
- Communication skills, words for feelings
Dissociation, Fragmentation: 
- Grounding, reconstruction of memory, integration: trauma-specific approaches

Systematic Error and Reenactment: 
- Change

Impaired Executive Function: 
- Healthier use of power and executive functions - self-control, self-discipline

Impaired Cognition: 
- Better judgment, decision-making

Inadequate relationship skills: 
- Social skills, relationships

Learned Helplessness: 
- Experiences

Aggression: 
- Ability to manage aggressive impulses

Unresolved Grief: 
- Mourning of what is lost

Demoralization and Failure of Imagination: 
- Belonging to a meaningful, worthwhile, nonviolent and caring culture & Imagining a different and better future

TRAUMA-INFORMED COMMUNITY

ADVERSITY AND TRAUMA AS CENTRAL CONCERNS FOR PUBLIC HEALTH

TERTIARY PREVENTION: TREATMENT

SECONDARY PREVENTION: AT-RISK

PRIMARY PREVENTION: UNIVERSAL PRECAUTIONS

MENTAL HEALTH

HEALTHCARE

CHILD WELFARE

EDUCATION

WELFARE

CORRECTIONS

EARLY CHILD JUSTICE

• Universal knowledge about trauma, adversity and its effects

PRIMARY: Trauma-informed

• Policies and practices in place to minimize damage and maximize opportunities for healthy growth and development in populations at risk.

SECONDARY: Trauma-responsive

• Therapeutic interventions that specifically explore the trauma in the initial phases of therapy and then utilize those discoveries as a foundation as the therapy moves into current issues.

TERTIARY: Trauma-specific
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