Changing the odds for children exposed to trauma and stress

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Adverse Childhood Experiences (ACEs)

- Verbal Abuse
- Physical Abuse
- Sexual Abuse
- Physical Neglect
- Emotional Neglect
- Witness IPV
- Substance Abuse in Home
- Separated/Divorced Parents
- Family Member Incarcerated
- Family Member Mentally Ill or Suicidal

https://www.cdc.gov/violenceprevention/acestudy/
ACEs influence behavior & health

In multiple studies, ACEs predicted

- Risky health behaviors (smoking, obesity, alcohol/drug abuse)
- Chronic health problems
  - Heart disease, cancer, diabetes, fractures, hepatitis, COPD
- Mental health
  - Depression, anxiety, panic reactions
Oklahoma ACEs - Children now

Oklahoma parents were surveyed about child’s ACEs (2011-12)

- 30% - Economic Hardship (ranked 45th)
- 30% - Divorce (ranked 50th)
- 17% - Parent abused alcohol or drugs (49th)
- 11% - Witnessed domestic violence (50th)
- 12% - Had a parent with a mental illness (43rd)
- 10% - Had a parent incarcerated (48th)
- 13% - Was a victim of or witnessed neighborhood violence (49th)
- 17% - Already experienced 3 or more ACEs (49th)

Highest rates (with Montana and W. Virginia) of children with ≥4
Oklahoma history of trauma & stress
Extended ACEs Pyramid

- Early Death
- Burden of disease, distress, criminalization, stigmatization
- Coping
- Allostatic Load, Disrupted Neurological Development
- Complex Trauma/ACE
- Race/Social Conditions/Local Context
- Generational Embodiment/Historical Trauma

Trauma and social location

Microaggressions, implicit bias, epigenetics

*http://www.cdc.gov/violenceprevention/acestudy/pyramid.html*
Figure 1. The Stress Response and Development of Allostatic Load. The perception of stress is influenced by one's experiences, genetics, and behavior. When the brain perceives an experience as stressful, physiologic and behavioral responses are initiated, leading to allostasis and adaptation. Over time, allostatic load can accumulate, and the overexposure to mediators of neural, endocrine, and immune stress can have adverse effects on various organ systems, leading to disease.

Allostatic load: Wears out body’s ability to regulate stress
Stress & the Brain
• Frontal executive functioning areas are disengaged
• Subcortical fight or flight areas are engaged

Trauma: Allostatic load
The wear and tear that the body experiences due to repeated cycles of stressful events as well as the inefficient turning-on or shutting off of these responses

FRONTAL EXECUTIVE FUNCTIONING AREAS: DISENGAGED
The prefrontal cortex is the "CEO" of the brain. It regulates decision making, judgment, planning, moral reasoning, and sense of self. Stressful experiences (academic pressure, sleep deprivation, substance abuse, etc.) disengage the frontal lobes. Over time, this can lead to impulsive, short-sighted, even violent behavior; increased anxiety; depression; alcohol and drug abuse; learning disorders; and increased stress-related diseases.

SUBCORTICAL FIGHT OR FLIGHT AREAS: ENGAGED
The subcortical arousal system—thalamus, hippocampus, brainstem, and hypothalamus—mobilizes the body for action, increasing heart rate, respiratory rate, and muscle tone. The nature of this system is to bypass the frontal executive functioning and trigger the fight or flight mode.
Tulsa Children’s Project

- Based at Tulsa Educare
- Improve child outcomes by supporting
  - Teachers
  - Parents’ education and economic security
- Highly integrated set of interventions
- Multiple partners: OSU, OU, Harvard, local agencies
- Funded by George Kaiser Family Foundation

http://youtu.be/3AKYdr2VGxo
Is childhood stress/trauma involved? Does it affect children’s development?

- Parent measures
  - ACE scores, stress
  - Health status
  - Access to care

- Child measures of and in children
  - Behavioral dysregulation (DECA scores)
  - Biological dysregulation (salivary cortisol)
Yes: Behavioral dysregulation...

Parent’s ACEs predict current stress, which increases parenting distress, and decreases perceived the parent-child relationship, resulting in lower teacher ratings of child’s socio-emotional development (DECA).

Castle, Guss, Hays-Grudo, Miller-Cribbs & Horm, 2016
...and stress hormone dysregulation

Note: ***p < .001, **p < .01, *p < .05; model fit: $\chi^2 (4) = 3.87, p = .42$, RMSEA = .00, CFI = 1.00, TLI = 1.01.
What if we intervene at the ACEs-affected level?

- Adverse Childhood Experiences
- Impaired bio/neurological functioning
- Impaired social, cognitive, emotional functioning
- Problematic behaviors
- Chronic disease and conditions
- Early death

Games to improve executive function skills
MBSR (mindfulness) to create new synapses
Mindfulness-Based Stress Reduction -- MBSR

- What fires together, wires together
- Medical research: improved survival with mindfulness practice
- Brain changes with mindfulness
  - Structure
  - Function

http://www.nmr.mgh.harvard.edu/~lazar/
New knowledge about effects of trauma

Following birth of three new branches of science:

- **Neuroscience**: how the brain supports mental processes
- **Developmental psychopathology**: how adverse experiences impact development of the mind and brain
- **Interpersonal neurobiology**: how behavior influences emotions, biology & mind-sets of those around us
Three avenues for treatment

- Top down – by talking, (re-)connecting with others, allowing past and current experiences to be acknowledged and processed
- Medications that shut down inappropriate alarm reactions, or other technologies that change the way the brain organizes information
- Bottom up – by allowing the body to have experiences that viscerally contradict the helplessness, rage, or collapse that result from trauma.

Most people will benefit from a combination of methods
Three Levels of Stress Response

**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.
PACEs: Protective and Compensatory Experiences that buffer trauma/stress

- Our communities, organizations, extended families and friends can be part of buffering the damaging effects of adversity and stress.
- Developmental psychologists have identified a number protective and compensating experiences that mitigate or reduce the harmful consequences of ACEs outside of the parent-child relationship
  - Unconditional love, connectedness, community engagement
  - Security: order, predictability, mastery/self-efficacy
- Because the brain is constantly creating new networks of synapses (based on experiences), creating protective environments can help at any age.
<table>
<thead>
<tr>
<th>Direct Experience</th>
<th>Environmental conditions</th>
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<tbody>
<tr>
<td>Have someone who loved you unconditionally (you did not doubt that they cared</td>
<td>Have an engaging hobby -- an artistic or intellectual pastime either alone or in a group?</td>
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<td>about you)?</td>
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<tr>
<td>Have at least one best friend (someone you could trust, had fun with)?</td>
<td>Have an adult (not your parent) you trusted and could count on when you needed help or advice?</td>
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<tr>
<td>Do anything regularly to help others or do special projects in the community to</td>
<td>Live in a home that was typically clean AND safe with enough food to eat?</td>
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<td>help others?</td>
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<tr>
<td>Were you regularly involved in organized sports groups or other physical activity?</td>
<td>Have a school that provided the resources and experiences you needed to learn?</td>
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<td>Were you an active member of at least one civic group or a non-sport social group?</td>
<td>Were there rules in your home that were clear and fairly administered?</td>
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CIRCA
CENTER FOR INTEGRATIVE RESEARCH ON CHILDHOOD ADVERSEITY

Funded by NIH July, 2016 for five years: $11.3M
Multiple partners: OSU Center for Health Sciences, OSU-Stillwater, OSU-Tulsa, OU-Tulsa
Purpose: Identify and address childhood sources of disparities in health and development
Build research program in Oklahoma
Summary

- ACEs have serious negative effects on development and health
  - brain impairments, resulting in deficits in emotion regulation, executive function skills (memory, focused attention), increased vigilance and difficulty connecting with others
  - risky health habits (attempts at coping)
  - altered metabolic and immune functioning and subsequent chronic diseases and premature death
- ACEs are common in OK
- Programs targeting biobehavioral effects of ACEs are an effective third avenue to treatment of effects
- Protective and compensatory experiences (PACES) buffer the negative effects of ACEs
- The ACEs/PACES model provides a framework for prevention and intervention programs to break the cycle of adversity.
Resources

Kabat-Zinn  
Van Der Kolk  
Dan Siegel