When They Were Young:
The Intersection of Adverse Childhood Experiences and Problem Gambling

23rd Annual RGANM Conference
A U G U S T 8 , 2 0 1 9

Frank J. Kros, MSW, JD
Transformation Education Institute

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I am not a problem gambling expert...
Baltimore, Maryland, USA
The Children’s Guild

- 6 Schools
- 2 are Non-Public
- 4 Charter (Reg-Ed)
- 3 Group Homes
- Therapeutic Foster Care
- Family Help Center (OMHC)
- 2 Autism Centers
Our Schools Are Different...
## Today’s Itinerary

1. Childhood Trauma: The Adverse Childhood Experiences Study (ACES)

2. How ACES Change the Architecture of Young Brains and Susceptibility to Gambling Addiction in Adulthood
But First...
How is your brain this afternoon?
Brain Speed Test
Answer Out Loud!
As Fast as You Can!
Ready?
What Color?
What Do Cows Drink?
An Important Brain Rule...

Associations in the brain are real, physical brain structures.

*It is much more difficult for our brains to unlearn something than to learn something new.*

Changing repetitive behavior takes time and enormous consistency.
1. Childhood Trauma: The Adverse Childhood Experiences Study (ACES)
Understanding N.E.A.R.

Neuroscience
Epigenetics
Adverse Childhood Experiences
Resilience
Understanding Adverse Childhood Experiences

Building Self-Healing Communities
Early Adversity Increases Physical, Mental, Behavioral Problems, Scientists Report

Centers for Disease Control & Prevention, Kaiser Permanente Study

Over 17,000 study participants

The ACE Study confirms, with scientific evidence, that adversity early in life increases physical, mental and behavioral problems later in life.

Dr. Robert Anda & Dr. Vincent Felitti Investigators
HUMAN NERVOUS SYSTEM

Nervous system orchestrates body functions & perceptions. Neuroscience helps us understand why A.C.E.s are so powerful.

- Brain
- Spinal Cord
- Peripheral Nerves

Single Nerve Cell
SYNAPTIC DENSITY

At Birth  Elementary Age  Puberty

Single Neuron
What kind of situations might be a good match for a person who tends to be edgy, hypervigilant, emotionally detached, or quick to act?
ADAPTATIONS VS EXPECTATIONS

WHEN BIOLOGY collides WITH SOCIAL EXPECTATIONS we run into TROUBLE
EXPERIENCE & ADAPTATION

Sensitive periods

Cause-Effect
STRESS
Interpretations Can Differ
set points in place by
EARLY ADULTHOOD

At Birth

SYNAPTIC DENSITY

Elementary Age
We have a collective CHOICE
The ACE Study
FINDING MORE CONNECTIONS

how multiple forms of childhood adversity can affect many important PUBLIC HEALTH PROBLEMS
### Adverse Childhood Experiences

**ARE COMMON**

<table>
<thead>
<tr>
<th>Household Dysfunction</th>
<th>Neglect</th>
<th>Abuse</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance Abuse</td>
<td>Emotional</td>
<td>Emotional</td>
</tr>
<tr>
<td>Parental Sep/Divorce</td>
<td>Physical</td>
<td>Physical</td>
</tr>
<tr>
<td>Mental Illness</td>
<td></td>
<td>Sexual</td>
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<tr>
<td>Battered Mothers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criminal Behavior</td>
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</tr>
</tbody>
</table>

- Substance Abuse: 27%
- Parental Sep/Divorce: 23%
- Mental Illness: 17%
- Battered Mothers: 13%
- Criminal Behavior: 6%
- Emotional: 15%
- Physical: 10%
- Emotional: 11%
- Physical: 28%
- Sexual: 21%

**TOTAL 10 ACEs**
ACE Score = Number of ACE Categories

ACE Scores Reliably Predict Challenges During the Life Course

0 ACEs: 33%
1 ACEs: 26%
2 ACEs: 16%
3 ACEs: 10%
4+ ACEs: 16%
Anxiety
Depression
Difficulty Concentrating
SMOKING
EXAMPLES OF ACE-ATTRIBUTABLE PROBLEMS

Alcoholism & Alcohol Abuse
Chronic Obstructive Pulmonary Disease
Coronary Heart Disease
Depression
Drug Abuse & Illicit Drug Use
Fetal Death
Intimate Partner Violence

Liver Disease
Mental Health Problems
Obesity
Sexual Behavior Problems
Smoking
Unintended Pregnancy
Violence
Workplace Problems
ACEs are Common, Interrelated, Powerful

High ACE Scores in Population

Increased Risk of Multiple Health and Social Problems

Intergenerational Transmission of ACEs
Population Attributable Risk

- Drinking & driving past 30 days: 45%
- Cancer: 24%
- Cardiovascular disease: 65%
- Alcoholism: 41%
- Chronic depression: 17%
- Diabetes (insulin): 15%
- Asthma: 26%
- Workplace injury: 31%
- >=3 falls require treatment in 90 days: 22%
- Currently smoking: 51%
- High risk for HIV: 15%

Controls: gender, age, income, education, race-ethnicity
2. How ACES Change the Architecture of Young Brains and Susceptibility to Gambling Addiction in Adulthood
Quick Brain Chemistry

- **Cortisol** - “UH-OH”
- **Adrenaline** - “YIKES!”

VS.

- **Serotonin** - “AHH..”
- **Dopamine** - “YAHOO!”

These pairs do not play well together...
Basic Brain Chemistry
Big Brain Idea

Chronic Stress Changes the Brain.
What is Stress?

Stress is a physiological response to a perception of a lack of control over an aversive situation, person or event.
3 Stages of the Stress Response (Amygdala Driven)

Alert

Redirects Attention and Energy

Stress Response

Cortisol

Distress!

Cortisol x2 Adrenaline

Amygdala compels you to:
1. Solve the problem causing threat.
2. Escape from the problem.
3. Cope with the problem.
4. Defend yourself the best you can.
5. At any cost, survive.
Let’s Meet the Amygdala
3 Stages of the Stress Response *(Amygdala Driven)*

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Alert

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DANGER!
The Paradox of Cortisol

Too Little
- Weak memory formation (encoding)

Too Much
- Strong encoding for emotion
- Weak encoding for detail
- Poor recall
- In extreme, cell death

Just Right
- Moderate cortisol improves the formation of detailed memory for facts and events
- Low cortisol promotes efficient and effective recall
Too Much Cortisol!

Excess cortisol kills cells in the hippocampus, the brain’s memory maker. Excess cortisol also shrinks the corpus callosum and the frontal lobes.
Effects of Too Much Cortisol

- Brain Damage
- Poor Social Skills
- Low Verbal Skills
- Memory Impairment

- Aggression
- Impulsiveness
- Anxiety
- Dissociation
Results of Traumatic Stress

• Emotional Problems
  (Burgess et al., 1995)

• Lowers IQ, Reading Scores
  (Delaney-Black, et al. 2002)

• Memory Loss
  (Lupien, et al. 2001)

• Shortens Dendrites
  (De Bellis, et al., 2004), (Cook and Wellman, 2004), (Brown, et al. 2005)

• Neuron Death

• Inappropriate Attachments
  (Schore, A. 2002)
# The Stress Response on the Brain

<table>
<thead>
<tr>
<th>Hippocampus</th>
<th>Amygdala</th>
<th>Frontal Cortex</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory Center</td>
<td>Center of Uncertainty</td>
<td>Executive System</td>
</tr>
<tr>
<td>Most Stress</td>
<td>Emotional Regulation</td>
<td>Planning, Judgment, Problem Solving, Impulse Control</td>
</tr>
<tr>
<td>Hormone Receptors</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decreased Function</td>
<td>More Anxiety</td>
<td>Reorganizes Neuronal Connections</td>
</tr>
<tr>
<td>Less Communication</td>
<td>“Faster” Fear</td>
<td></td>
</tr>
<tr>
<td>Between Neurons</td>
<td>More Excitatory Neurons</td>
<td>Poor Decision Making</td>
</tr>
<tr>
<td>Lower Neurogenesis</td>
<td>Depletion of Dopamine</td>
<td>“Fuzzy” Thinking</td>
</tr>
<tr>
<td>Dead Neurons</td>
<td></td>
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</table>
Let’s Connect!

- Stress is designed to be compelling, uncomfortable and of short duration.
- As stress intensifies and/or endures, the drive for homeostasis (“yellow box”) activity is very powerful.
- If an individual cannot immediately solve the problem causing the perceived threat, the brain urges escape.
Quick Brain Chemistry 2.0
Example: Anxiety and Depression

• Anxiety = Elevated Cortisol
• Depression = Decreased Serotonin
Quick Brain Chemistry 2.0

Responding to Anxiety and Depression

• Anxiety = Decrease Cortisol
• Depression = Elevate Serotonin
Quick Brain Chemistry 2.0

The “Drive to Balance” may be unconscious, feel like a compulsion and lead to compulsive behavior. That’s because your brain eventually myelinates (habituates) your response.
Let’s Connect!

• The drive for homeostasis is achieved if enough dopamine and/or serotonin can be produced.

• Escape = activity that produces dopamine and/or serotonin in significant quantities to “flush” cortisol and adrenaline.
What are Your ESCAPE Activities?
What are the ESCAPE Activities for a Problem Gambler?
Consolidating Our Knowledge

- Some of your clients likely experienced trauma in childhood.
- These traumatic experiences orient the brain to respond powerfully to stress.
- Escape activities like gambling relieve the impact of stress.
- Gambling may be a significant stress reliever for these clients and may be addictive.
Consolidating Our Knowledge

- Unidentified, untreated childhood trauma persists into adulthood.
- Childhood trauma may be the underlying cause of the client’s symptoms.
- Screening and treating the underlying trauma may be clinically indicated in addition to addressing the gambling addiction.
Thanks for inviting me!

kros@upsidedownorganization.org
443-277-6036
Twitter @FKros