ACES and Attachment: Understanding the Impact of Adverse Childhood Experiences on Neurobiology, Adult Illness, Anxiety and Trauma

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The term was first used to capture the combined experiences of childhood abuse and household dysfunction by Felitti et al, 1998.

The objective of the first ACE study was to assess the impact of ACES on adult health behaviors and healthcare utilization. Navolta, McGee, & Underwood, 2018.

Over the course of many ACE studies, the link between ACES and chronic illness in adulthood and early morbidity has been supported.

Adverse Childhood Events – ACE Study

- Significant number of studies published since original ACE Studies.
- Typically include 10 specific types of ACES:
  - Childhood Abuse (Emotional, Physical and Sexual)
  - Neglect (Emotional and Physical)
  - Witness domestic violence,
  - Parental marital discord
  - Living with substance abusing, mentally ill, or criminal household members

- 61% of participants reported 1 ACE in their childhood
- Of those reporting 1 Ace, 86% were also exposed to at least 1 additional ACE!
- 16% reported 4 or more additional exposures to ACES.
Individuals with ACES have higher likelihood of experiencing physical and/or psychological health consequences (Afifi et al., 2008)

- Alcoholism (7.4 x higher), IV drug use (11.3 x higher), Depression (4.5 x higher), Suicide attempts (12 to 15 x higher)
- Emotional dysregulation, dissociation, poor attachment, Obsessive-Compulsive Disorder

Often engage in high risk behaviors that are often the case of premature death.

- Includes smoking, overeating, promiscuity, substance abuse, and self-harm behaviors. Behaviors emerge as a means of coping with chronic stress associated with history of childhood trauma. (Garner, 2014)
- Heart Disease, Stroke, Liver Disease, Lung Cancer, COPD, Rheumatoid Arthritis
- Sex with over 50 individuals, unwanted pregnancies, sexually transmitted diseases
- Hepatitis, Diabetes, Cirrhosis
Adult Symptoms of Childhood Trauma (Schwartz, 2016)

- **Cognitive Distortions** (inaccurate beliefs about self, others, the world)
- **Emotional Distress** (Overwhelmed, Anxious, Helpless, Hopeless, Loneliness, Shame, Unfairness, Injustice, Depression, Suicidal Thoughts)
- **Disturbing Somatic Sensations** (Disconnect from Body, Feelings)
- **Disorientation** (Loss of orientation between the past, present, and future)
- **Hypervigilance**
- **Avoidance**
- **Interpersonal Problems** (withdrawing from, blaming, pushing away, or criticizing friends and family. Patterns probably learned from family of origin)
- **Reduced Brain Development** (Deficits in social skills and academic success)
- **Health Problems** (High blood pressure, blood sugar imbalances, food cravings, addictions, suppress immunity, digestive disturbances, sleep disturbances)
Where do ACES Fit on the Trauma Continuum?

Primary Trauma
(Primary Trauma Victim)

Secondary Trauma
(Trauma Experienced by Family Members, Friends, First-Responders, Helping Professionals, etc.)

Compassion Fatigue
(Trauma Experienced by Care-Givers and Helping Professionals)

Organizational Trauma

Posttraumatic Stress Disorder

Vicarious Trauma

Secondary Trauma

Developmental Trauma

Chiasmal Trauma

Burnout
● Attachment – the survival mechanisms within the genetic encoding of our human organism that compellingly seeks and requires a secure caregiver attachment.

1. Our brains are wired for connection
2. Our brains are strengthened by connection
3. Attachment (neuropsychology) cannot be fully understood outside of the context of relationships.  
   Arielle Schwartz (2014)

● The quality of these attachment relationships will dictate the client’s Internal Working Model:
   ○ How I see myself
   ○ How I see others (are they available and responsive?)
   ○ How I see the world around me
Attachment & Development of Affect Regulation

- Bowlby: attachment is all about safety and protection and emotional regulation in times of perceived threat or danger.
- 3-part motivational system of fear-attachment-exploration.
- Allan Shore – need for emotional regulation is what drives attachment behaviors.
- Affect regulation (reduction of fear) allows attachment and attachment drives the development of the pre-frontal cortex.
- Even before consciousness develops – parent is regulating the emotions of the baby through their own pre-frontal cortex. Brain to Brain regulation.
- Baby introjecting reflection of who they are from the parent (who am I in relation to others?)

Linda Graham MFT (https://lindagraham-mft.net/the-neuroscience-of-attachment/)
Understanding Trauma Memory, (Van Der Kolk, 1996)

Information filed in memory database
Available for autobiographical memory
Top-down Memory – Experienced in context (past, near-past, etc.)

Integration & Planning
Pre-Frontal Cortex
Online/Available

Thalamus
Relay sensory & Motor signals to Cortex and Limbic System

Hippocampus
Spatial memory shift from short-to long-term
Fit information into existing cognitive schema

Broca Area
Creates a Narrative/Story of what happened

Amygdala
Low Threat

Processing memory and Emotional Reactions

Auditory
Olfactory
Kinesthetic
Gustatory
Visual

9 Function of the Pre-Frontal Cortex
1. Regulation of body – ANS balance
2. Attuned Communication, felt sense of other’s experience.
3. Regulation of emotion
4. Response Flexibility – pause, options, evaluate options, appropriate decision
5. Empathy
6. Insight – Self awareness
7. Fear Extinction – GABA fibers to Amygdala
8. Intuition – deep knowing without logic

Non-Traumatic Memory Integration
Attachment relationships evolve over the first two years of life and beyond. They overlap with significant neurological developments in the brain. Pre-Frontal Cortex

Attachment is critical factor in a child’s ability to regulate emotion.

- It is a form of “dyadic” (Sroufe, 1995) or “mutual” (Tronick, 1989) emotion regulation.

- Traumatized parents can’t give their children what they don’t have!
  - The key is attunement of caregiver to the verbal and non-verbal cues of the child (Stern, 1985)
  - Attachment status of a parent will predict the attachment status of their child to that parent, with up to 80% predictability (van Ijzendoorn, 1995)
Intoxication
Anxiety, Hyperarousal/Agitation
Anger, Conflict Arguments
Medical Legal, Employment Crises
Intrusive Thoughts/Nightmares
Dissociation, Depression

Identified
Client/Patient
Trauma/Addiction
Intergenerational transmission (Cultural Trauma): Epigenetics

Epigenetics
Alterations in genes that do not include structural changes to the DNA nucleotide sequence.
(Orr & Kaufman, 2014)

- Romens, McDonald, Svaren, Pollak (2014)
  - Child maltreatment affects the way children’s genes are activated.
  - Studied DNA methylation
    - Biochemical mechanism - helps cells control which genes are turned on or off.
  - Impacts HPA axis
    - Fewer glucocorticoid receptor sites
    - Makes it more difficult to regulate emotions.
- Studies on children of:
  - Native Americans (Yellow Horse Brave Heart, 2011)
  - Holocaust survivors (Nissenbaum, 2011)
  - African American Families – slavery and its aftermath (Graff, 2014)
1.) Social Communication or Social Engagement: Facial Expression, vocalization, listening
   - Dependent on Ventral Vagal (myelinated) nerve
   - From brain stem to nucleus ambiguous. Fosters calm behavioral states by inhibiting the influence of the sympathetic Nervous system on the heart.

2.) Mobilization: Fight/Flight behaviors
   - Dependent on sympathetic nervous system (increased metabolic activity & cardiac output)

3.) Immobilization: Dissociation, Behavioral Shutdown
   - Most primitive – shared with most vertebrates
   - Dorsal Vagus nerve (from brain stem to dorsal motor nucleus). Connected to all organs below the heart.

Over time, child develops unconscious process called Neuroception. Life-long mechanism for constant assessment of Safety. Processing verbal and non-verbal communication.
What are parents communicating when they don’t think they are communicating?

Tone of voice, volume, cadence, urgency, etc.
Anger, Frustration, Depression, Anxiety, Disinterest, Despair, Dysfunction
Neuroception – Assessment of Safety/Danger
(Porges, 2011)

● Neuroception is a subconscious system for detecting threat and safety
  ○ Based in evolution. Fine tuned through Polyvagal development from living with caregivers.
  ○ Immediate assessment of facial and verbal feedback, used to assess if that person is safe or dangerous.
  ○ Perceptions trigger neurobiologically determined prosocial or defensive behaviors.

● May have no cognitive awareness of danger, but on neurophysiological level, body has already started adaptive defensive behaviors.

1. Assessment of risk; 2. If environment appears safe, then must inhibit/down-regulate primitive defensive reactions such as fight/flight/freeze; 3. Engage pro-social process
Effect of emotional arousal on declarative (Semantic) Memory, (van der Kolk, 1996)

- Information NOT filed in memory database
  - Experience memories as sensory triggers
  - Bottom-Up Memory – experienced as present

- Pre-Frontal Cortex
  - Offline/Unavailable

- Extreme Stress interferes with hippocampal functioning, memories based on fragments of information!
  - Broca’s Area is off-line (language center)
  - No language = No narrative memory

- Hippocampus
  - Spatial Memory
    - Shift from Short to Long Term
    - Fit information into existing cognitive Schema

- Thalamus
  - Auditory
  - Olfactory
  - Kinesthetic
  - Visual
  - Gustatory

- Autonomic Nervous System
  - Fight/Flight/Freeze

- Amygdala
  - High Threat
  - Fear-Terror

- Fear, terror, powerlessness, anger, somatic experience, images, sounds, smells, etc.

- Processing memory and Emotional Reactions

- Spatial Memory
  - Shift from Short to Long Term
  - Fit information into existing cognitive Schema

- Threat ➔ Event ➔ Semantic ➔ Procedural ➔ Time
State 0: (zero): calm, responsive, awake

State 1: slightly anxious, annoyed, nervous, physical tension

State 2: highly anxious, angry, panic symptoms, intense physical tension (stomach, chest, breathing), powerful fight or flight responses

State 3: Dual activated (a mixture of activation with dissociative symptoms): tension with somatic collapse, anxiety, sleepy, panic, hopelessness, heaviness, blurred vision

State 4: pure dissociation marked by a distinct lack of physical sensation and flat affect, numbed out, blank, feeling ‘floaty’, depersonalized, and disconnected
Secure and insecure attachment impacts the development of almost every major part of the brain.

Toxic stress, including child maltreatment can impact each of the following areas of the brain:

- **Hippocampus** – *reduce volume* (central to learning & memory). May also reduce ability to bring cortisol back to normal after stress event.
- **Corpus Callosum** - *reduce volume* in largest white matter structure in brain. Responsible for inter-hemispheric communication (arousal, emotion, higher cognitive abilities.)
- **Cerebellum** - *decreased volume*, reduced ability to coordinate motor behavior and executive functioning. Impulse Control!
- **Prefrontal Cortex** – *reduced size*, critical area for behavior, cognition and emotional regulation.
- **Amygdala** – *Increased size*, can result in over-activation, impacts perception of what stimuli are threatening and can trigger emotional dysregulation.
Developing the Therapeutic Relationship
Implications of Neuroception in the Joining Process

- Based on facial expressions, tone of voice, etc.:
  - If therapist is assessed as safe, neural circuit actively inhibits sympathetic responsible for fight/flight/freeze and promoted prosocial behaviors are enabled. Patient can relax a bit.
  - If therapist is assessed as a threat, neural circuits trigger fight/flight/freeze and disable prosocial behaviors. Patient experiences activation of sympathetic nervous system.

Clients & Families are assessing you more than you are assessing them!

Most patients with attachment and/or trauma issues will struggle with one/both of the following, in terms of neuroception:

- Faulty assessment of risk due to reinforcement of sympathetic response due inconsistent or negative caregiver response
- Failure to inhibit defensive reactions
# Childhood Trauma and Attachment – Core Needs & Ultimate Treatment Goals (Heller & Lapierre, 2012)

<table>
<thead>
<tr>
<th>Core Needs</th>
<th>Core Capacities for Well-Being</th>
<th>Core Difficulties – Survival Strategies</th>
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</table>
| Connection (With Self & Others) | Be in touch with body and emotions  
Be in connection with others                                                                 | Disconnected from physical and emotional self  
Difficulty relating to others                                                                 |
| Attunement (Needs)            | Attune to our needs and emotions  
Recognize, reach out for, and take in physical and emotional nourishment                        | Difficulty knowing what we need  
Feeling our needs do not deserve to be met                                                                 |
| Trust (Trust Self & Others)  | Healthy dependence and interdependence                                                        | Feeling we cannot depend on anyone but ourselves  
Feeling we have to always be in control                                                               |
| Autonomy                     | Set appropriate boundaries  
Say no and set limits  
Speak our mind without guilt or fear                                                                | Feeling burdened and pressured  
Difficulty setting limits and saying no directly                                                        |
| Love-Sex                     | Live with an open heart  
Integrate in loving relationship with a vital sexuality                                           | Difficulty integrating heart and sexuality  
Self-esteem based on looks and performance                                                              |
Therapeutic Relationship with Attachment Issues

- **Initial goal is to establish “emotional contact” with the client (Make the covert, Overt)**
  - Welcome struggle, predict times of frustration and conflict
  - Reinforce & welcome fear, pain, discomfort, loneliness, sadness, etc.
  - Can the client hang in there with you and stay in therapy?
  - Introduce the fact that we will be having some difficult discussions that may challenge the relationship.

- **Empathic statements may create fear. Being understood means being seen, exposed & vulnerable. Client may feel out of control.**
  - Client with avoidant attachment may reengage in defense system by striking out at the therapist.
  - Client with anxious attachment may complement and “buddy-up” to the therapist to avoid transparency and possible rejection.
Safety – Self-Awareness of Therapist Characteristics

- Transference & Countertransference: **Karpman’s Triangle + Bystander Role**: Roles that family members may assume during times of high stress/anxiety that serve to organize the family.
  - Savior
  - Perpetrator
  - Victim
  - Bystander

- Most therapists are comfortable in the Savior Role, but struggle when perpetrator or bystander roles are projected onto them. *What role did you play in your own family?*

- Treating professionals must possess **a non-anxious presence** and be fully aware of their own:
  - Attachment Style, ANS activation, Procedural responses to stress, Countertransference, Compassion Fatigue, etc.
Tx Goals – Initiation of Attachment System

- **Identification of losses/consequences.** This will typically begin with review of losses associated with addiction and then move into familial and other interpersonal losses.

- As much as possible focus on feelings, current here-and-now experience with the therapist.

- **Help client with emotional regulation.** Identify triggers and coping strategies for regulating the ANS. Teach and practice skills (neuroplasticity).

- Focus on themes such as vulnerability/victimization, fear/anger, rejection/avoidance.

- Focus on ambivalence, clarifying motivation, contraband language, inherent paradox, mourning/loss, forgiveness, etc.

- **Initiate/promote connection.** First with the therapist. Then family (when appropriate), then peers, others.

- Work towards positive sense-of-self, inner feeling of security and independence.

- **Resolve shame-based and pride-based defenses**
Helping Clients work with Needs

Schema Therapy (Young, Klosko & Weishaar, 2003) – Schemas result from unmet core emotional needs in childhood. Emotional temperament interacts with painful childhood events in the formation of schemas.

- Help clients process how core beliefs and schemas work paradoxically. They typically challenge client to act contrary to what is needed.

4 types of early life experiences that foster the acquisition of schemas

1. **Toxic frustration of needs** (Emotional Deprivation, Abandonment).
2. **Traumatization and victimization**, (Mistrust/Abuse, Defectiveness/Shame, Vulnerability to Harm).
3. **Parents give too much of something that in moderation would be healthy** (i.e., learned helplessness, codling, parentification). (Dependence/Incompetence, Entitlement/Grandiosity)
4. **Selective internalization or identification with significant others** (i.e., identifying with abusive parent), Some identifications become schemas, while others become survival skills
A Major Struggle – Shame-Based vs Pride-Based Identification  
(Heller & Lapierre, 2012)

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<th>Survival Style</th>
<th>Shame-Based Identifications (Both – And)</th>
<th>Pride- Based Identifications</th>
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| **Connection** | Shame at existing, Feeling like a burden  
Feeling of not belonging | Pride in being a loner, Pride in not needing others  
Pride in not being emotional |
| **Attunement (Needs)** | Needy  
Unfulfilled  
Empty  
Undeserving | Caretaker  
Pride in being the shoulder that everyone cries on  
Make themselves indispensable (needed)  
Pride in not having needs |
| **Trust** | Small  
Powerless  
Used  
Betrayed | Strong and in control  
Successful  
Larger than life  
User, betrayer |
| **Autonomy** | Angry  
Resentful of authority  
Rebellious  
Enjoys disappointing others | Nice, Sweet  
Compliant  
Good boy/girl  
Fear of disappointing others |
| **Love-Sex** | Hurt  
Rejected  
Physically flawed  
Unloved & unlovable | Rejects first  
Perfect/Grandiose  
Does not allow for mistakes  
"Seamless" having everything together |
You have been home for a few weeks. You are having a hard day, with significant craving. You have called your sponsor and everyone else that you can think of, but you are continuing to struggle. You are planning to go to a meeting in a few hours, so you stop home for a break. But when you walk in the door, your partner or parent watches you walk up the hall and asks, “are you using?”

What would be the most appropriate response?
<table>
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<tr>
<th>Probable Thoughts specific to each schema?</th>
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<tr>
<td>Probable Feelings specific to each schema?</td>
</tr>
<tr>
<td>Probable Reactions/Behaviors specific to each schema?</td>
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Top Down Processing

Cortical, Cognitive processing that initiates with thoughts, which flow down to emotions, sensory information.

Pre-frontal cortex fully engaged

More relaxed emotional state

Intentional interaction with full executive functioning

Environment experienced as safe or relatively safe

Talk therapy works!
• CBT, MI, 12 Step Facilitation

Bottom-Up Processing

Subcortical, limbic system processing of sensory information, Autonomic Nervous System Response, Pre-Frontal Cortex off-line

Highly activated, anxious, panic, dissociative

Reactive Interaction with limited to no executive functioning.

Environment experienced as threatening or dangerous.

Talk Therapy does not work!

Clinical focus must shift to affect regulation, resourcing, DBT skills until patient resumes lower stressed state.

In Trauma Integrated Treatment, Therapists must be able to move quickly and insightfully between these two types of information processing!
1. **Support Connection and Organization**
   - Tracking Connection and Disconnection
   - Tracking Organization and Disorganization
   - Develop Positive Resources
   - Encourage Somatic Mindfulness (connect to the body)
   - Maintain Therapeutic Relationship
   - Develop, Challenge, Rebuild, Challenge

2. **Work in Present Moment**
   - Simultaneous work on addiction milestones and trauma issues that prevent work on addiction issues.
   - Foster Agency and Empowerment in the moment
   - Present focus on emotions, body sensations

3. **Explore Identity**
   - Support Expansion and Aliveness
   - Address Shame-based Identifications and Pride-Based Counter-Identifications

4. **Regulate the Nervous System**
   - **Containment** – work with issues while remaining grounded in their body and the present moment.
   - **Grounding** – relieve dissociation, get grounded in the body
   - **Titration** – awareness of pace and ANS/Organizational tolerance of distress.
   - **Pendulation** – conscious movement of client into and out of work on issues and the maintenance of tolerable levels of distress & ANS regulation
Resilience: Dennis Charney, M.D. ISTSS Keynote Presentation, 2013

- Core beliefs that few things can shatter!

- Moral Compass

- Cognitive Appraisal

- Spirituality Religion

- Optimism

- Social Support

- Facing Fears

- Active Coping

- Exercise

- Resilience

Studied prisoners of war, special forces, victims of abuse, natural disaster survivors, individuals living in poverty, and first responders of 9/11 attacks.

Much of current research based on neurobiology developed in childhood, adult care, capacity for self-reflection and self-regulation!

To some degree genetic, but mostly epigenetic!
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