

Life Experience and Wellbeing

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Objectives

- Review the relationship between childhood history and wellbeing, (Adverse Childhood Experience study findings)
- Identify the significance of childhood on the formation of lifelong emotional action patterns , both adaptive and maladaptive
- Explain the neurobiologic networks—micro (historical) and macro (modular)—involved in forming and remodeling emotional action pattern response circuits
- Use these principles to inform clinical practice and public policy

CH History and Wellbeing

- Adverse Childhood Experiences (ACE) Studies:
 - 1995-the present Kaiser Permanente (over 17,000 participants from an HMO population), Centers for Disease Control (over 26,000 participants from five states)
 - Integrated comprehensive information about childhood maltreatment and family dysfunction with information about current health status and behaviors

Kaiser

Emotional abuse 10.6%
Physical abuse 28.3%
Sexual abuse 20.7%
Emotional neglect 14.8%
Physical neglect 9.9%
Mother tx violently 12.7%
HH SUD 26.9%
HH MI 19.4%
HH member in prison 4.7%
Parental sep/divorce 23.3%

CDC

Verbal abuse 25.9%
Physical abuse 14.8%
Sexual abuse 12.2%
Domestic violence 16.3%
HH with SUDs 29.1%
HH with MI 19.4%
HH member in prison 7.2%
Parental sep/divorce 26.6%

CH History and Wellbeing

Disease: adult ischemic heart disease, cancer, COPD, skeletal fractures, and liver disease
SUDs: alcohol dependence and abuse, smoking, illicit drug use
Mood disorders: depression, suicide attempts
Miscellaneous: fetal death, risk for intimate partner violence, unintended pregnancies
CH and adolescence: early initiation of smoking, sexual activity, illicit drug use, pregnancies, suicide attempts

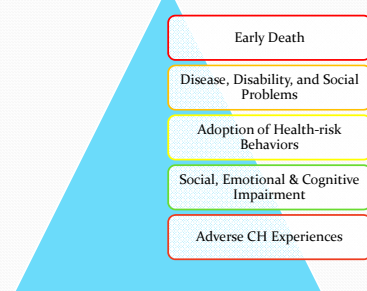
CH History and Wellbeing

Kaiser	CDC
At least one ACE 63.9%	At least one ACE 59.4%
One ACE 26.0%	One ACE 22.4%
Two ACEs 15.9%	Two ACEs 13.1%
Three ACEs 9.5%	Three ACEs 8.8%
Four+ ACEs 12.5%	Four+ ACEs 8.7%

CH History and Wellbeing

- There was a **graded relationship** between the number of categories of childhood exposure and each of the adult health risk behaviors and diseases that were studied ($P < .001$)
- 4+ categories** of exposure vs. no exposures:
 - 4- to 12-fold** increased health risks for alcoholism, drug abuse, depression, and suicide attempts
 - 2- to 4-fold** increase in smoking, poor self-rated health, 50 or more sexual intercourse partners, and STDs
 - 1.4- to 1.6-fold** increase in physical inactivity and severe obesity

CH History and Wellbeing



The Historic and Modular Brain



The Historic and Modular Brain

- The brain is an HISTORIC organ
 - Developmental HOT ZONES change over time
 - They are quiescent or active based on the age of the person
 - Events that happen during development of a HOT ZONE dictate the baseline function of that zone for life
- The brain is a MODULAR organ
 - There are not centers for different categories of function: i.e. there is not a social center, or a mood center, or a psychosis center
 - There are unique modules of organizations/networks that are extensively interconnected between each other (horizontally) and between higher and lower centers (vertically) that when combined produce social abilities, mood, psychosis, etc.

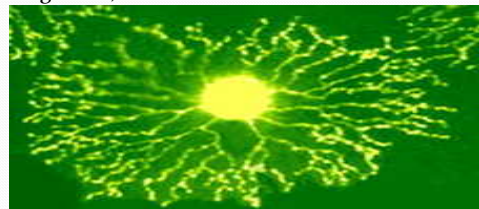
The Historic Brain

- The brain is an HISTORIC organ
 - Records the nature of the experiences someone lives through:
 - Pattern of the experience
 - Frequency of the experience
 - Duration of the experience
 - Intensity of the experience
 - Meaning of the experience
 - Time in development when it occurs

The Historic Brain

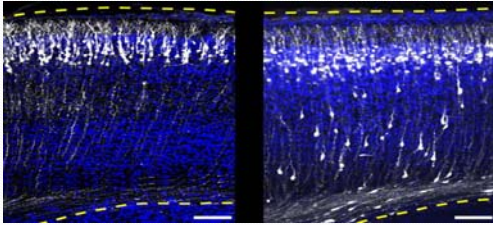
The recording of history is in the CELLS and how they CONNECT and how they WORK:

Neurogenesis, cell birth



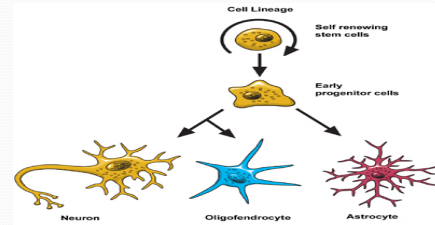
The Historic Brain

Neural migration, cell movement



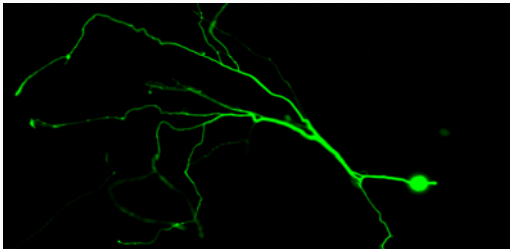
The Historic Brain

Differentiation, cell maturation



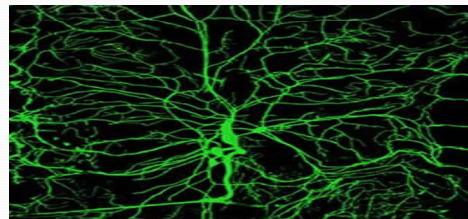
The Historic Brain

Apoptosis, death of redundant neurons



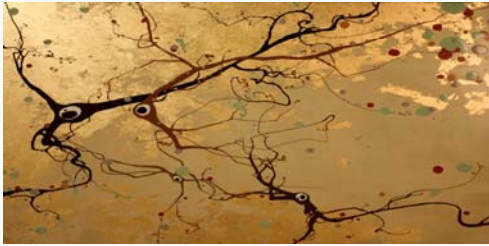
The Historic Brain

Arborization, growth of dendrite "bush" to take in information and axonal "fields" to connect to the next cells in line



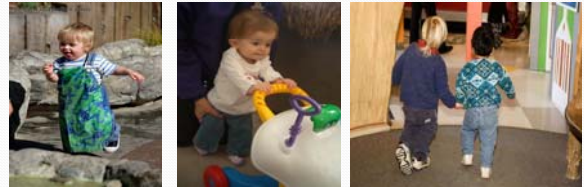
The Historic Brain

Synaptogenesis, point-of-contact links between neurons and synaptic sculpting, building synapses up



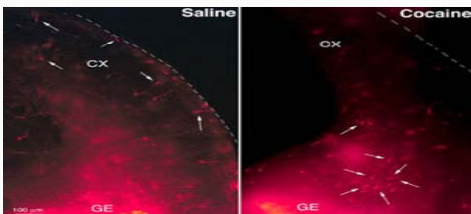
The Historic Brain

Myelination, wrapping insulation around axons so they become more efficient



The Historic Brain

Abnormalities at any stage of this process will lead to maladaptive function of that module of the brain:



The Historic Brain

- Maladaptive function at the microscopic level may have such an impact that it causes noticeable malfunction
- Cocaine exposure in the fetus:
 - Reductions in cortical gray matter and total brain volume
 - Increases risk for premature birth and low birth weight
 - Impairment in sustained attention and self-regulated behaviors



The Historic Brain

- Alcohol exposure in the fetus kills sensitive brain cells and impairs cell differentiation:
 - Reduction in brain size and disproportionate reductions in the size of specific brain structures including the basal ganglia, cerebellum, corpus callosum
 - Mental retardation
 - Problems w/language, learning, attention, slower and less efficient information processing and reaction times, and deficits in executive function
 - Behavioral problems that can be life-long in their impact

The HISTORIC Brain

- ALL of the above processes have HOT ZONES of development
 - Neurogenesis: conception to birth
 - Migration: conception to age 3
 - Differentiation : 2nd trimester to age 1
 - Apoptosis 3rd trimester to age 1 and again in adolescence
 - Arborization 3rd trimester to age 1
 - Synaptogenesis 3rd trimester to 8 months after birth
 - Synaptic sculpting birth to 8 mos and again puberty to early 20's
 - Myelination birth to age 4, age 10 to early 20's

The HISTORIC Brain

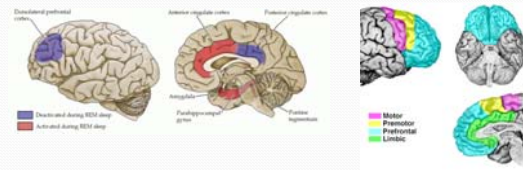
- But outside of HOT ZONES, all of the above processes CONTINUE FOR LIFE
 - THIS is the basis of ALL forms of therapy
 - Development at the cellular level is ACTIVITY-DEPENDENT
 - USE it and it develops
 - NEGLECT it and it is lost
 - If we only USE systems that foster NEGATIVE EMOTIONALITY we REINFORCE them
 - If we begin to USE systems that foster POSITIVE EMOTIONALITY we REINFORCE them

The MODULAR Brain



The MODULAR Brain

The PREFRONTAL CORTEX:



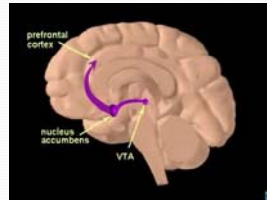
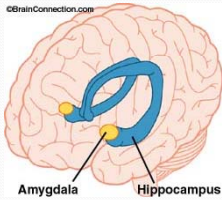
- The PREFRONTAL CORTEX:
 - REGULATES emotions
 - Produces CONSCIOUSNESS
 - Becomes aware of FILTERED incoming information within 0.250 milliseconds (a SLOW POKE vs. the limbic system that is aware of UNFILTERED incoming information within 0.125 milliseconds)
 - Contains VERBAL communication centers
 - Performs WORKING MEMORY tasks
 - HOT ZONE for development of the prefrontal cortex is from puberty to early 20's—therefore *EVENTS IN THE ENVIRONMENT DURING THIS TIME INFLUENCE WHETHER OR NOT THE PFC FAVORS ADAPTIVE VS. MALADAPTIVE FUNCTIONS*

- Mother Nature's teeter-totter at this level:
 - Positive emotional regulation vs. negative emotional regulation
 - AKA solution-centered vs. problem-centered thinking



The MODULAR Brain

The LIMBIC SYSTEM:



- The LIMBIC SYSTEM:
 - PRODUCES emotions
 - Is UNCONSCIOUS
 - Becomes aware of incoming information within 0.125 milliseconds
 - Contains centers for CODING and RETRIEVING memory
 - Is the center of NON-VERBAL communication
 - Originates limbic reflexes: i.e. RAGE
 - HOT ZONE for development is from birth to around age 5—therefore *EVENTS IN THE ENVIRONMENT DURING THIS TIME INFLUENCE WHETHER OR NOT LIMBIC BALANCE FAVORS ADAPTIVE VS. MALADAPTIVE EMOTIONS*

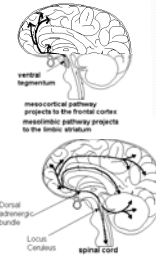
- Mother Nature's teeter-totter at this level:
 - Amygdala-Adrenalin circuits vs. Nucleus accumbens-Dopamine circuits
 - AKA Survival vs. Pleasure



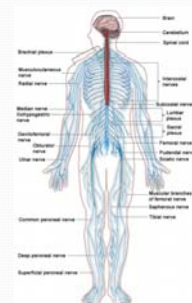
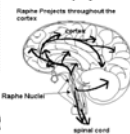
The MODULAR Brain

The BRAIN STEM and SPINE:

Dopaminergic projections



Serotonin projections

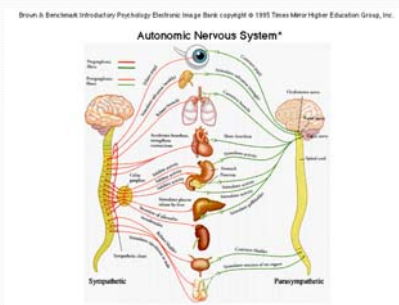


- The **BRAIN STEM**:
 - PRODUCES mood chemicals
 - Is **UNCONSCIOUS**
 - Controls the **AUTONOMIC** nervous system: heart beating, blood pressure, breathing cycles, etc. required for life
 - Originates brain stem reflexes: i.e. heart rate increases
 - **HOT ZONE** is in the fetus
 - *EVENTS IN THE ENVIRONMENT DURING THIS TIME INFLUENCE WHETHER OR NOT LIMBIC BALANCE FAVORS ADAPTIVE VS. MALADAPTIVE EMOTIONS*
 - Stressed mother → stress hormones → hyperactive adrenalin center at birth

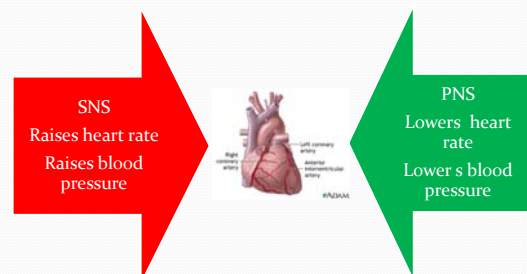
- Mother Nature's teeter-totter at this level:
 - Sympathetic nervous system (Adrenalin-based) vs. Parasympathetic nervous system (Anti-adrenalin)
 - AKA avoidance (fight, flight, freeze) vs. approach (warm and fuzzy)



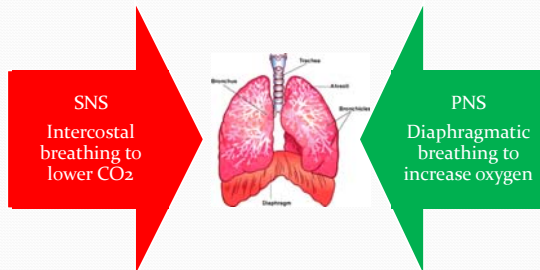
Mother Nature's Teeter-Totter



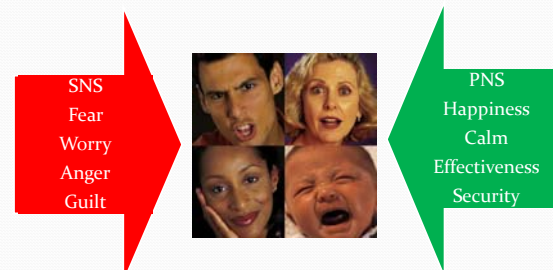
Mother Nature's Teeter-Totter



Mother Nature's Teeter-Totter

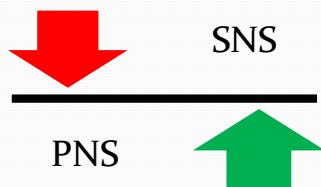


Mother Nature's Teeter-Totter



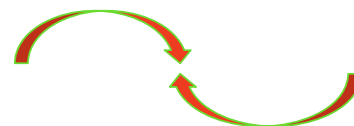
Mother Nature's Teeter-Totter

- Adaptive emotions guide appropriate actions ONLY when we can modulate them and maintain emotional balance:



Mother Nature's Teeter-Totter

- Adaptive emotions maintain action patterns that favor stability throughout life:



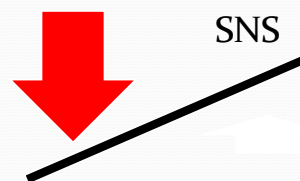
Mother Nature's Teeter-Totter

- The result is life stability:



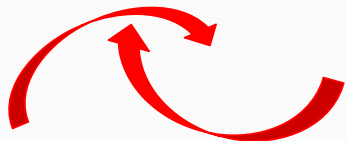
Mother Nature's Teeter-Totter

- Those with maladaptive emotion patterns cannot use emotions to guide appropriate actions because their emotions are out of balance:



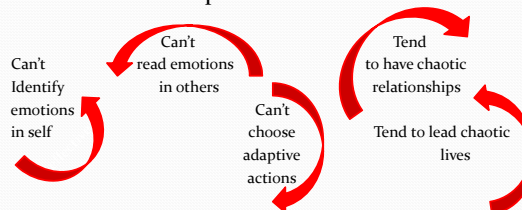
Mother Nature's Teeter-Totter

- Those whose emotion patterns are maladaptive from childhood have been shown to have *STRESS SENSITIZATION* in their stress circuits making their stress reactivity excessive, they are vulnerable to decompensation with added stress in adulthood:



Mother Nature's Teeter-Totter

- Maladaptive individuals end up experiencing long term unstable life patterns:



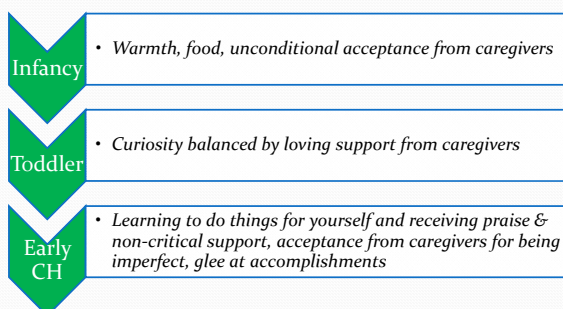
Adaptive vs. Maladaptive Patterns



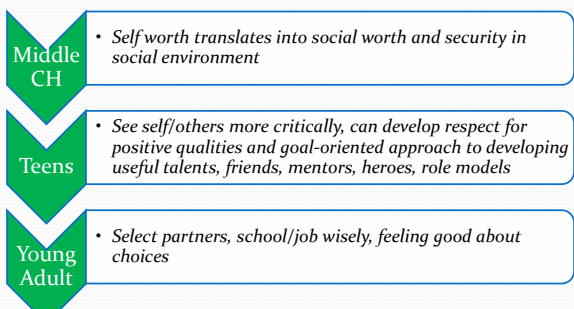
Adaptive vs. Maladaptive Patterns

- Erik Erickson's stages of emotional development
 - Each age of a person has a particular HOT ZONE for emotional and social developmental where their needs are met in adaptive or maladaptive ways
 - If needs are met in an ADAPTIVE manner (i.e. with secure attachments to caregivers) brain systems connect in a BALANCED manner that favors long term mental health and wellbeing
 - If those needs are met in a MALADAPTIVE manner (i.e. with insecure attachments to caregivers due to ABUSE and NEGLECT) brain systems connect in an UNBALANCED manner that works against mental health and wellbeing in the future

Adaptive vs. Maladaptive Patterns



Adaptive vs. Maladaptive Patterns



Adaptive vs. Maladaptive Patterns

Middle adult

- *Feel satisfied, work hard, have a meaningful life with purpose, reaping the benefits of hard work*

Older adult

- *Satisfaction with choices, relationships, accomplishments*

Adaptive vs. Maladaptive Patterns

Infancy

- *Basic trust vs. Mistrust*

Toddler

- *Autonomy vs. Shame and doubt*

Early CH

- *Initiative vs. Guilt*

Adaptive vs. Maladaptive Patterns

Middle CH

- *Industry vs. Inferiority*

Teens

- *Identity vs. Role confusion*

Young Adult

- *Intimacy vs. Isolation*

Adaptive vs. Maladaptive Patterns


Middle adult

- *Generativity vs. Stagnation*

Older adult

- *Ego integrity vs. Despair*

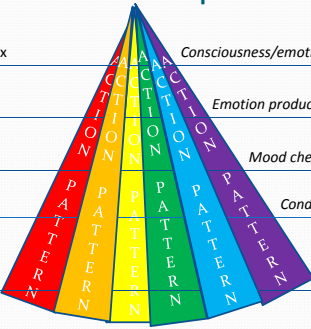
- Patterns of behavior use all levels of the nervous system from top to bottom in coordinated fashion to result in a specific action
- PFC → consciousness, emotional regulation
- Limbic System → emotion production, hormone regulation
- Brain Stem → mood chemicals and the autonomic nervous system (ANS)
- Spine → conduit to and from the body
- Peripheral nervous system → conduit to and from the spine



Adaptive vs. Maladaptive Patterns

- We express these patterns as a combination of conscious actions (PFC) and unconscious (below the PFC) actions
- Each Action Pattern is aimed at achieving a specific result
- Action Patterns are programmed during human development based on environmental cues during the growth years
- There are millions of potential Action Patterns any human being is capable of producing at any given time

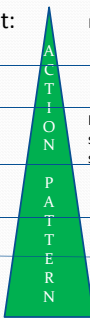
Adaptive vs. Maladaptive Patterns



PreFrontal cortex	Consciousness/emotion regulation
Limbic system	Emotion production/hormones
Brain stem	Mood chemicals/ANS
Spine	Conduit to body
Peripheral NS	Actions implemented

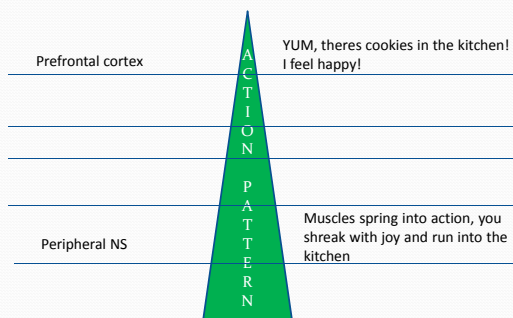
Adaptive vs. Maladaptive Patterns

Secure attachment:



Prefrontal cortex	Mom's after school snacks
Limbic system	I SMELL COOKIES!
Brain stem	Releases dopamine to nucleus accumbens/sends signals out on CN's to increase salivation and digestive juices
Spine	Muscles prepare for action
Peripheral NS	

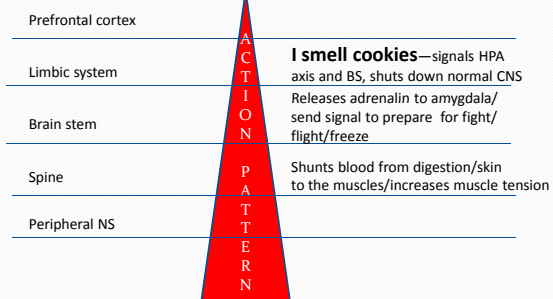
Adaptive vs. Maladaptive Patterns



Adaptive vs. Maladaptive Patterns

Insecure attachment:

Dad's rages if woken up too early



Adaptive vs. Maladaptive Patterns



Adaptive vs. Maladaptive Patterns

30 years later:

- Securely attached person smells cookies and feels happy, anticipating a treat, an adaptive response
- Insecurely attached person smells cookies and becomes anxious, afraid *and may not have any conscious awareness of WHY!* a maladaptive response

Clinical Implications



Clinical Implications

- Everyone has the capacity to express an array of DIFFERENT action patterns THROUGHOUT LIFE
- Moving from maladaptive to adaptive action patterns is based on USE of the brain in more adaptive ways
- Versus a traditional model of FOCUSING ON DISEASE to rid people of disease, newer neurobiologically informed/evidence-based methods FOCUS ON WELLBEING
- ALL RIVERS LEAD TO THE SAME OCEAN!

Clinical Implications

The Solution is multimodal: An Individual Perspective

- | | | |
|------------------|---|------------------------------|
| 5 Medications | To take the "edge" off | Easier, |
| 4 Therapy | CBT/DBT/CPT/PE/ACT/12-STEPS/1 to 1 | Shorter |
| 3 Social Support | Enjoyable interacting w/trusted friends, mentors, sponsors, family | Lasting |
| 2 Self-Care | nutrition, activity, sunlight | |
| 1 Transcendence | "spirituality", "higher power", "oceanic feelings", "flow"
"mindfulness-based" | Harder,
Longer
Lasting |

Clinical Implications

- The Solution is multimodal: A Public Policy Perspective
- Primary Prevention
 - Multimedia public campaigns focusing on resilience skills—to begin to re-set social expectations
 - School curricula from early years fostering individual resilience and teaching problem-solving, values that foster wellbeing, communication skills, self-awareness skills, working among others with different ways of thinking/being/appearing, community activism, etc.
 - Prenatal training for prospective parents

Clinical Implications

- Secondary Prevention
 - SBIRT programs in primary care settings
 - Training providers in social and health care systems in Trauma-Informed approaches to clients
 - Home visits and education for high risk families
 - Crisis Intervention teams based out of local social services offices or police departments, i.e. Family Crisis, Mental Health Crisis
 - Programs for mentoring at-risk youth
 - Multi-Disciplinary teams in treatment settings
- Tertiary Prevention
 - Implement substance abuse treatment programs and parenting classes in prisons and jails
 - Drug Courts

Objectives

- Review the relationship between childhood history and wellbeing, (Adverse Childhood Experience study findings)
- Identify the significance of childhood on the formation of lifelong emotional action patterns , both adaptive and maladaptive
- Explain the neurobiologic networks—micro (historical) and macro (modular)—involved in forming and remodeling emotional action pattern response circuits
- Use these principles to inform clinical practice and public policy



Clinical Implications

- Emotions are a basis for COMMUNICATION (verbal and non-verbal, conscious and unconscious) and for ACTIONS (verbal and non-verbal, conscious and unconscious)
- They allow us to anticipate the actions of those around us and adjust our responses to achieve our best interests
- They are sophisticated higher-level communications that improve survival
- Once they occur, they cannot be changed

Clinical Implications

- Trauma survivors cannot easily modulate their emotional reactions based on the here and now, they are vulnerable to reacting in a manner they learned in early childhood:
 - They may *blow up* after minor provocations
 - They may *freeze* when frustrated
 - They can *become helpless* in the face of trivial challenges
 - Their emotions appear *out of place* and their actions *bizarre*
 - They may make a *parasuicidal* or *suicidal attempt* when upset


Clinical Implications

- We now know this difference is because STRESS REACTIVITY is not the same between “normal” people and those who experienced early-life trauma:
- Fetus → stressed mothers bathe the fetus' brain in stress hormones leading to over-active fight/ flight/freeze systems from birth
- First five years → chaotic early lives favor over-development of amygdala circuits; feelings of fear, anxiety, guilt, anger block normal development of pleasure circuits

Clinical Implications

- Middle CH → over-developed amygdala circuits:
 - Impair child's ability to relax in social situations
 - Self-image leans towards the belief s/he is “defective”
 - Self-efficacy lags, feelings of helplessness develop; deep limbic connections to the frontal cortex favor the amygdala

Clinical Implications

- Prepubescence to early 20's  underdevelopment of the mood regulating capacity of PFC, leading to personality development based on avoiding emotional pain:
 - Extreme disorganization (role confusion and unwise choices based on an immature decision-making ability, feeling strongly without impulse control) vs.
 - Extreme organization (perfectionist tendencies, unrealistic self expectations, chronic feelings of being defective due to not being perfect)

Clinical Implications

- Early 20's middle adulthood → adult roles and bodies:
 - Without rational decision-making capacity lead to problematic choices and beginning the next generation of dysfunctional families
 - Success based on perfectionism but underlying anxiety and never feeling exactly "right" with self and others
- Late adulthood → myelination of deep fibers catch up with the person's age and they may begin to improve insight/judgment

Clinical Implications

- Treatment:
 - Remember the purpose of emotions ➡ to lead to actions
 - When there is an emotional trigger, the right actions will lead to a solution and then resolution and dissipation of the emotion
 - If action is blocked ➡ the emotion leads to frustration, discouragement, disgust, rage

Clinical Implications

- Anger → right action → solution → resolution
 → block action → confrontation
- Fear → right action → solution → resolution
 → block action → paralysis/collapse
- Joy → right action → approach → reward
 → changed to disappointment → hopeless

Clinical Implications

- Treatments focused ABOVE the brain stem:
 - CBT, traditional psychotherapies, psychoeducation, etc.
 - Rely on *understanding* and *insight* and do not attend to the experiences of inner or physical sensations and pre-programmed action patterns
 - The areas of the PFC that generate *understanding* and *insight* do not have direct connections to the brain centers that generate emotions

Clinical Implications

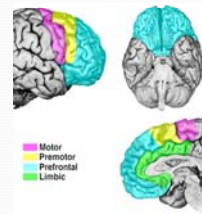
- TRYING TO INHIBIT EMOTIONS OR THE PHYSICAL ACTIONS THEY PROVOKE DOES NOT STOP THE FEELINGS OR ACTION PATTERNS FROM OCCURRING
- We need techniques that help people integrate an awareness of their internal sensations and action patterns to help them change them, newer “evidence-based” treatments are doing this

Clinical Implications

- Treatment BELOW the brain stem:
 - Trauma-related physical sensations, or IMPLICIT memories, are stored in the deep limbic system and brain stem and are hidden from consciousness
 - INTEROCEPTIVE awareness, or attention to inner sensations and perceptions, helps us to access these implicit memories and modify them
 - Treatments that activate brain centers that modulate emotions will cause those centers to DEVELOP (actually THICKEN THE CORTEX!)

Clinical Implications

- The results are better tolerance of distress, more effective emotional modulation, and stable interpersonal relationships → non-self-defeating Action Patterns



Clinical Implications

- However, trauma victims:
 - Will feel overwhelmed when asked to focus on inner sensations
 - May deny having an inner sense of themselves
 - Often feel disgusted with themselves, or
 - May feel helpless, panicked when asked to deal with traumatic memories

Clinical Implications

- The treatment is to teach them to recognize, accept, and deal with internal residues of the past via learning to tolerate focusing their attention on their internal experience while *processing* thoughts/feelings/sensations *without over-reacting* to them
- This constitutes an ACTION as far as the amygdala is concerned and prevents over-activation of the stress response from that center
- Patients can then begin to translate implicit emotions and sensations into language → adaptive coping improves

Clinical Implications

- Several of the newer evidence-based therapies use this type of approach
- All of these techniques rely on the brain's ability to remodel itself and form new circuits of more adaptive Emotional Action Patterns through intentional action of the individual
- USE of new circuits is what develops them
- An added benefit is the AGE of the individual, since neurodevelopment culminates in the late 40's → thinking becomes more efficient than ever before and people become more open to learning different coping techniques after repeated failures with less adaptive methods

Clinical Implications

- Childhood trauma contributes to stress sensitization of overly-reactive emotional circuits
- When activated later in life by any form of adult distress, these over-reactive emotional circuits prompt people act out pre-programmed Action Patterns that have little or nothing to do with the present situation but that lead to self-defeating choices and behaviors
- Suicidal or parasuicidal behaviors often result
- Changing the reactivity of those circuits is something that only an individual can do for themselves....

Clinical Implications

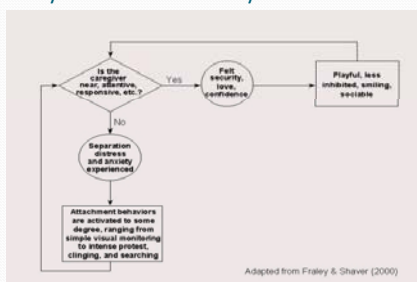
-but there ARE things that VA employees can do to favor adaptive coping:
 - LISTEN to people in a non-judgmental, accepting manner to MODEL the type of behavior that will help them learn to cope with strong unpleasant feelings
 - Be a safe HOLDING ZONE for them by respecting their emotional and physical boundaries
 - Return CONTROL to the patient, since by definition loss of control through the betrayal of people they could not trust contributed to the problem in the beginning

Clinical Implications

- ENFORCE BOUNDARIES FOR THE PATIENT'S SAKE, clear boundaries reinforce the patient's sense of safety, however, this must be balanced with flexibility on our parts in keeping rules reasonable
- EDUCATE patients to respect the effects of trauma on their present day lives without blaming anyone for what they had no control over in the past
- HOLD THEM RESPONSIBLE for choices they make today to minimize enabling maladaptive behaviors
- REFER them to resources where more definitive care will be available

Lifelong Emotional Action Patterns

John Bowlby's "normative theory" of attachment



Lifelong Emotional Action Patterns

- Mary Ainsworth's Strange Situation Study: 12-month old infants and parents are brought into a room and systematically separated and reunited
 - Most children (i.e., about 60%) behave in the way implied by Bowlby's "normative" theory. They become upset when the parent leaves the room, but, when he or she returns, they actively seek the parent and are easily comforted by him or her. Children who exhibit this pattern of behavior are often called **securely attached**.

Lifelong Emotional Action Patterns

- Other children (about 20%) are ill-at-ease initially, and, upon separation, become extremely distressed. Importantly, when reunited with their parents, these children have a difficult time being soothed, and often exhibit conflicting behaviors that suggest they want to be comforted, but that they also want to "punish" the parent for leaving. These children are often called **anxious-resistant or ambivalently attached**.

Lifelong Emotional Action Patterns

- The third pattern of attachment that Ainsworth and her colleagues documented is called **avoidant or dismissing attachment**. Avoidant children (about 20%) don't appear too distressed by the separation, and, upon reunion, actively avoid seeking contact with their parent, sometimes turning their attention to play objects on the laboratory floor.
- Summary: secure attachment vs. insecure attachment (ambivalent vs. dismissing)

Lifelong Emotional Action Patterns

- Hazan and Shaver: the emotional bond that develops between adult romantic partners is partly a function of *the same attachment behavioral system* that gives rise to the emotional bond between infants and their caregivers:
 - Both feel safe when the other is nearby and responsive
 - Both engage in close, intimate, bodily contact
 - Both feel insecure when the other is inaccessible

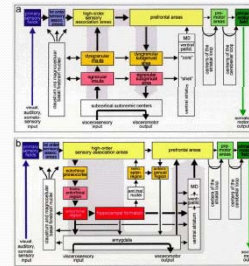
Lifelong Emotional Action Patterns

- Both share discoveries with one another
- Both play with one another's facial features and exhibit a mutual fascination and preoccupation with one another
- Both engage in "baby talk"
- There are parallels between secure attachment and positive therapist-patient interactions

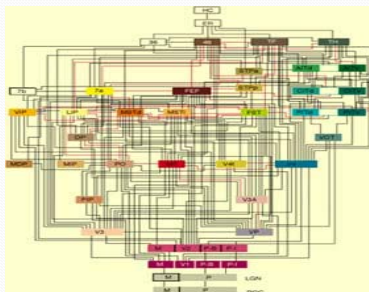
Lifelong Emotional Action Patterns

- We may expect some adults to be secure in their relationships, others to be anxious-resistant, and others to be avoidant
- Individual differences in attachment influence relationships and personal functioning in adulthood in the same way they do in childhood
- Whether an adult is secure or insecure in his or her adult relationships is a reflection of his or her attachment experiences in early childhood

Neurobiologic Networks



Neurobiologic Networks



Neurobiologic Networks

- “BRAIN”—networks of nerves and their distribution in the body
- “MIND”—electromagnetic patterns along neural networks from head to toe
- “ACTION PATTERNS”—patterns of usage, organized into neuronal networks, that become engrained and easier to use over time, these are our baseline default modes, i.e. motor action patterns; sensory action patterns; emotional action patterns

Neurobiologic Networks

- “ACTION PATTERN” Programming:
 - Nature vs. Nurture
 - Nature—genetics, basic temperament, the “hardware” of a human being
 - About 45% of personality
 - *Some people by “nature” are hearty, resilient vs. others who are vulnerable to breakdown in response to stressors*
 - *For example, the short allele of the serotonin transporter is associated with depression, the long allele is associated with resilience*

Neurobiologic Networks

- Nurture—environment determining the strength of how circuits connect, the “software” of a human being
 - About 55% of personality
 - *Some people by “nurture” are hearty, resilient due to secure attachments to caregivers vs. others who are vulnerable to poor coping in response to stressors, due to insecure attachments to caregivers*
 - *For example, research has shown that one caring adult can help a vulnerable child to be resilient later in life, spirituality conveys resilience under hardship*

Neurobiologic Networks

- The most important period of a person’s “Nature” life is probably when they are a fetus when the body and nervous systems are developing and making initial connections
- The most important period of a person’s “Nurture” life is in the first five years after birth when the limbic system is connecting and growing, *LIFELONG EMOTIONAL ACTION PATTERNS ARE BASED ON THE ENVIRONMENT AND “HARD WIRED” BY AGE FIVE!*

Clinical Implications

- A side note on resilience:

