The image features two hands, one at the top and one at the bottom, reaching towards each other. The hands are illuminated from the side, creating a strong contrast with the dark background. The fingers are slightly curled, and the palms are facing each other, suggesting a gesture of support, care, or a question being posed. The lighting highlights the texture of the skin and the shape of the fingers.

**MULTI-SYSTEM, MULTI-
PROBLEM CLIENT:
*REHABILITATION OR
HABILITATION?***

**Cardwell C. Nuckols, PhD
cnuckols@elitecorp1.com
www.cnuckols.com**

OVERVIEW

COMPLICATIONS

**PREFRONTAL CORTEX AND
NEUROPLASTICITY**

SOLUTIONS

COMPLICATIONS

- **ENVIRONMENT**
 - **POVERTY**
 - **CHILD AND ADOLESCENT DEVELOPMENT**
 - **EARLY LIFE DEVELOPMENTAL TRAUMA**
- **EARLY AND PERSISTENT ALCOHOL/DRUG ABUSE AND OTHER DIFFICULTIES SUCH AS EATING DISORDER, SEXUAL ACTING-OUT, ETC.**

IMMATURE PREFRONTAL CORTEX

ENVIRONMENT: POVERTY

- **Poverty may have direct implications for important, early steps in the development of the brain, saddling children of low-income families with slower rates of growth in two key brain structures**
- **By age 4, children in families living with incomes under 200 percent of the federal poverty line have less gray matter -- brain tissue critical for processing of information and execution of actions -- than kids growing up in families with higher incomes.**

ENVIRONMENT: POVERTY

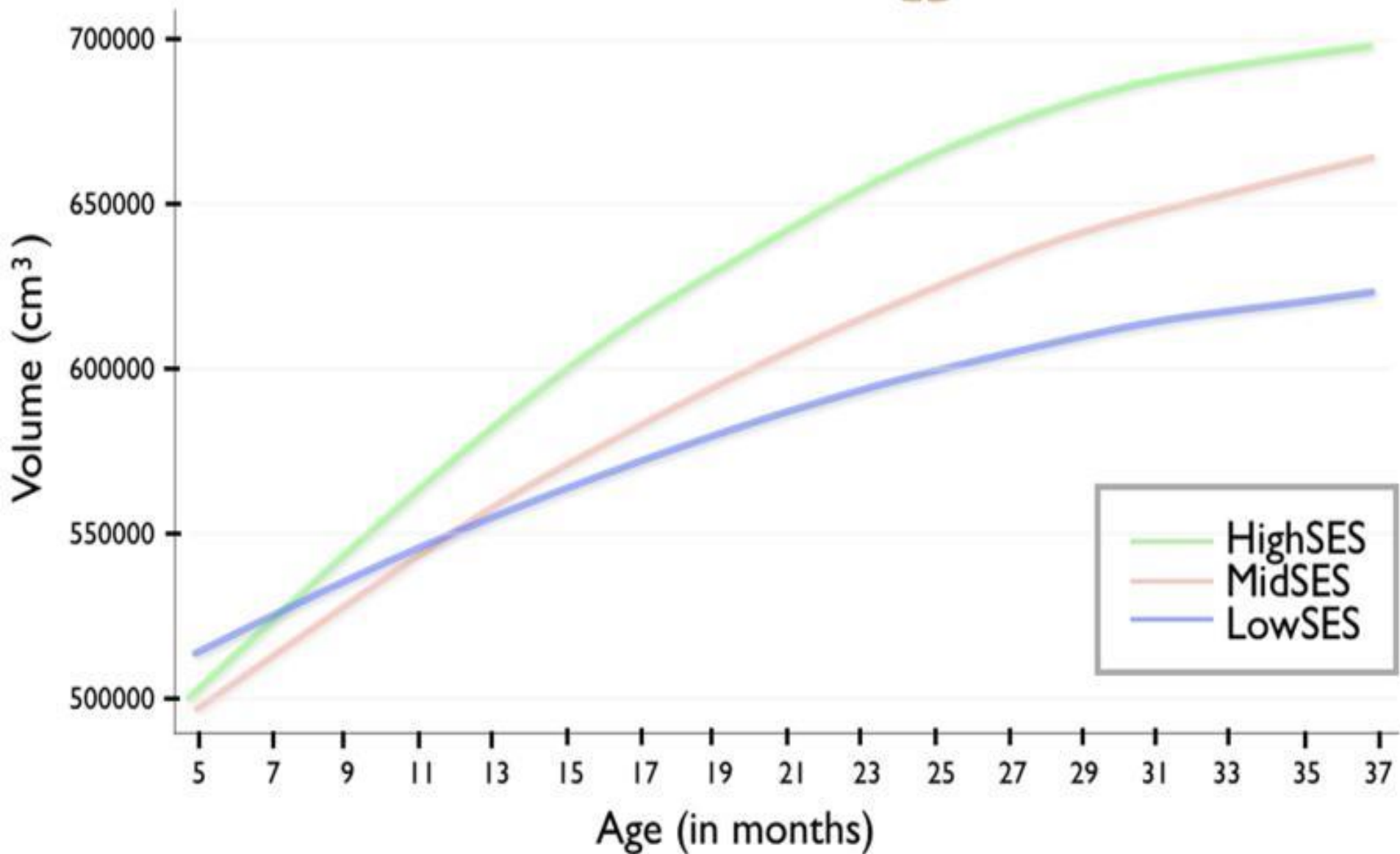
- **Children in poor families lagged behind in the development of the parietal and frontal regions of the brain -- deficits that help explain behavioral, learning and attention problems more common among disadvantaged children.**
- **The parietal lobe works as the network hub of the brain, connecting disparate parts to make use of stored or incoming information.**

ENVIRONMENT: POVERTY

- **The frontal lobe is the executive. It's the part of the brain we use to control our attention and regulate our behavior**
- **Educational disparities begin when transitioning to kindergarten: Are you able to pay attention? Can you avoid a tantrum and stay in your seat? Can you make yourself work on a project?**
- **The infants' brains look very similar at birth**

Jamie L. Hanson, Nicole Hair, Dinggang G. Shen, Feng Shi, John H. Gilmore, Barbara L. Wolfe, Seth D. Pollak. **Family Poverty Affects the Rate of Human Infant Brain Growth.** *PLoS ONE*, 2013; 8 (12)

Total Gray Matter



ENVIRONMENT: POVERTY

- **The landmark study by Hart and Risley (1995) revealed that children in high-income families are exposed to 30 million more words than children from families on welfare. This reduction in the quality and quantity of language input, along with greater exposure to unstructured sound such as ambient noise, may be affecting how the brain represents auditory information.**

ENVIRONMENT: POVERTY

- **Adolescents from a lower maternal educational background have neural responses to speech sounds that were noisier, more variable and represented the input signal weakly**
- **Their performances on tests of reading and working memory also were poorer.**
- **Acoustically augmenting the classroom made neural responses more stable.**

Skoe E, Krizman J, Kraus N. **The impoverished brain: Disparities in maternal education affect the neural response to sound.** *Journal of Neuroscience*, 2013

ENVIRONMENT: POVERTY

- **Exposure to poverty during early childhood is associated with smaller white matter, cortical gray matter, and hippocampal and amygdala volumes**
- **Test subjects who had lower family incomes at age 9 showed enhanced activity in the amygdala and less activity in areas of the prefrontal cortex, an area in the brain thought to regulate negative emotion.**

ENVIRONMENT: POVERTY

- **Amygdala and prefrontal cortex dysfunction has been associated with mood disorders including depression, anxiety, impulsive aggression and substance abuse**
- **Ability to regulate negative emotions can provide protection against the physical and psychological health consequences of acute and chronic stress**

P. Kim, G. W. Evans, M. Angstadt, S. S. Ho, C. S. Sripada, J. E. Swain, I. Liberzon, K. L. Phan. **Effects of childhood poverty and chronic stress on emotion regulatory brain function in adulthood.** *Proceedings of the National Academy of Sciences*, 2013

CHILD AND ADOLESCENT DEVELOPMENT

- **Puberty is starting earlier and the taking on of adult roles starts later**
- **Appears to be two crucial neural and psychological systems that interact to turn children into adults**
- **The developmental timing of these two systems has changed**
- **This has profoundly changed what we call adolescence**

CHILD AND ADOLESCENT DEVELOPMENT

- **EMOTION AND MOTIVATION SYSTEM**
 - Closely linked to the biological and chemical changes of puberty and involves the reward system (**SEEKING SYSTEM**)
 - This system turns 10 year olds into restless, exuberant, emotionally intense teenagers (later it turns back into placid adulthood)
 - Recent studies (Casey at Cornell) suggest adolescents aren't reckless because they underestimate risk but because they overestimate rewards-or, rather find rewards more rewarding than adults (reward centers are very active in adolescence)

CHILD AND ADOLESCENT DEVELOPMENT

- **EMOTION AND MOTIVATION SYSTEM**
 - **Want social rewards-respect from their peers**
 - **Recent study (Steinberg at Temple University)**
 - **Teenagers did a high-risk driving task while lying in a fMRI machine.**
 - **The reward systems lighted up much more when they thought another teenager was watching-and they took more risks**
 - **Puberty not only turns on the motivational and emotional systems but also turns it away from family and toward the world of equals**

CHILD AND ADOLESCENT DEVELOPMENT

- **CONTROL SYSTEM (PREFRONTAL CORTEX)**
 - It channels and harnesses the energy
 - The prefrontal cortex **GUIDES OTHER PARTS OF THE BRAIN** including those that govern motivation and emotion
 - This system inhibits impulses, guides decision- making, plans for the long-term and delays gratification

CHILD AND ADOLESCENT DEVELOPMENT

- **CONTROL SYSTEM (PREFRONTAL CORTEX)**
 - *This system is experience dependent*
 - It becomes more effective as we gain more SUPERVISED experience
 - **EXPERTISE COMES FROM SUPERVISED EXPERIENCE**
- **These two systems were in sync in the past where farming and hunter-gatherer societies prevailed**
- **These societies created formal and informal apprenticeships**

CHILD AND ADOLESCENT DEVELOPMENT

- **In contemporary life, the relationship between these two systems has changed dramatically**
- **Puberty and the motivational system kicks in earlier**
- **At the same time contemporary children have very little experience with the kinds of tasks they'll perform as grown-ups**

CHILD AND ADOLESCENT DEVELOPMENT

- *The experience of trying to achieve a real goal in real time in the real world is increasingly delayed and the growth of the control system depends on just those experiences*
- **As Ronald Dahl of UC-Berkeley states, “Today’s adolescents develop an accelerator a long time before they can steer and brake.”**

CHILD AND ADOLESCENT DEVELOPMENT

- There is strong evidence that IQ has increased dramatically with children spending more time at school and even some evidence *higher IQ is correlated with delayed prefrontal lobe development*
- So students know more about a divergent number of topics but are not getting any kind of apprenticeship.
 - *Just learning the nature of heat and the chemical composition of salt does not make you a good cook*

CHILD AND ADOLESCENT DEVELOPMENT

- It could be said that children started their internships at age 7 not age 27**
- There seems to be many young adults who are enormously smart and knowledgeable but directionless**
- They are enthusiastic and exuberant but unable to commit to a particular kind of work or a particular love until well into their 20's or 30's**

CHILD AND ADOLESCENT DEVELOPMENT

- *So faced with the uncompromising drive for sex, power and respect, these adolescents and young adults lack the expertise and impulse control necessary to successfully achieve within societal standards*
- There are two facts about the brain important to remember
- **First, experience shapes the brain**

CHILD AND ADOLESCENT DEVELOPMENT

- It is as true to say our experience of controlling our impulses makes the prefrontal develop as it is to say the prefrontal makes us better at controlling impulses
- Second, development plays a crucial role in explaining human nature
- More and more evidence that genes are just the first step in a complex developmental sequence involving interaction with the environment

CHILD AND ADOLESCENT DEVELOPMENT

- **It isn't that the adolescent/young adult brain just fails to show up**
- **It's that the prefrontal cortex is not properly instructed and exercised**
- **Because the brain is "plastic" it can respond to environmental stimuli**
- **Given the right stimuli this could help resolve some of the problems by helping to influence top-down control**

EARLY LIFE DEVELOPMENTAL TRAUMA

- Parents who physically neglect their boys may increase the risk that they will raise violent adolescents, according to sociologists. Examples of physical neglect include not taking a sick or injured child to the doctor, improperly clothing a child and not feeding a child, according to the researchers.**

EARLY LIFE DEVELOPMENTAL TRAUMA

- **While physical abuse is a significant contributor to violent behavior, physical neglect alone is an even stronger predictor of male adolescent violence than physical abuse.**
- **Physical abuse might at least show that parents are paying some type of attention to the child**
- Penn State. "Neglected boys may turn into violent adolescents." ScienceDaily. ScienceDaily, 18 August 2014. <www.sciencedaily.com/releases/2014/08/140818224847.htm>.

EARLY LIFE DEVELOPMENTAL TRAUMA

- ***PHYSIOLOGICAL***
 - AFFECT REGULATION AND IMPULSE CONTROL
 - SOMATIZATION AND MEDICAL PROBLEMS
- ***SELF AND IDENTITY***
 - ALTERED SELF AND OTHER PERCEPTION
 - ALTERED WORLD VIEW
- ***CONSCIOUSNESS***
 - ALTERED ATTENTION AND CONSCIOUSNESS

EARLY LIFE DEVELOPMENTAL TRAUMA

HYPERAROUSAL	DISSOCIATION
HYPERVIGILANT	DISENGAGE
REACTIVE	SUSPENSION OF TIME
TACHYCARDIA	BRADYCARDIA
NOREPINEPHRINE	ENDOGENOUS OPIOIDS
FLIGHT: Panic	FREEZE: Fear
FIGHT: Terror	DERIALIZATION
OLDER CHILDREN	DEPERSONALIZATION
MALES	COMPLIANT
	YOUNG CHILDREN FEMALES

EARLY LIFE DEVELOPMENTAL TRAUMA

- **PHYSIOLOGICAL**

- *Acute Effects of Hyper-arousal*

- *Chronic Effects of Hyper-arousal*

- *Acute Effects of Dissociation*

- *Chronic Effects of Dissociation*

EARLY LIFE DEVELOPMENTAL TRAUMA

- **Acute Effects of Hyper-Arousal**
 - **Increased Sympathetic NS (Fight/Flight)**
 - **Decreased pain in the short run**
 - **Decreased immune response**
 - **Cortisol reduces inflammation**
 - **Cortisol suppresses immune response**

EARLY LIFE DEVELOPMENTAL TRAUMA

- **Chronic Effects of Hyper-Arousal**
 - **Cortisol reserves get used up (hypocortisolemia)**
 - **Immune system becomes overactive**
 - **Rebound effect: get sicker than if not stressed**
 - **Increased inflammatory response**
 - **Increased risk of autoimmune disorders**
 - **Osteoarthritis**
 - **Crone's Disease**
 - **Multiple Sclerosis**

EARLY LIFE DEVELOPMENTAL TRAUMA

- **Acute Effects of Dissociation**
 - **Increased Parasympathetic NS**
 - **Decrease:**
 - Heart rate
 - Respiration/O₂ requirements
 - Blood pressure
 - **Other Effects:**
 - Increased Endorphins/Enkephalins
 - Decreased intensity of inflammatory response
 - Decreased sensation of pain

EARLY LIFE DEVELOPMENTAL TRAUMA

– Depleted supply of endorphins leads to:

- Chronic pain**
- Substance abuse (attempt to recharge endorphins)**
- Social isolation**
- Memory impairment**
- Depression**

EARLY LIFE DEVELOPMENTAL TRAUMA

- **Insecure attachment**
 - **Disorganized type**
- **Disorganized attachment themes**
 - **HELPLESSNESS**
 - **Abandonment**
 - **Betrayal**
 - **Failure**
 - **Dejection**

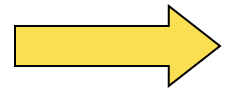
EARLY LIFE DEVELOPMENTAL TRAUMA

Abandonment Fear:

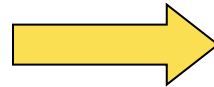
TRAUMA



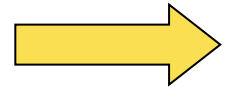
**ATTACHMENT
PROBLEMS**



ABANDONMENT



INCREASED



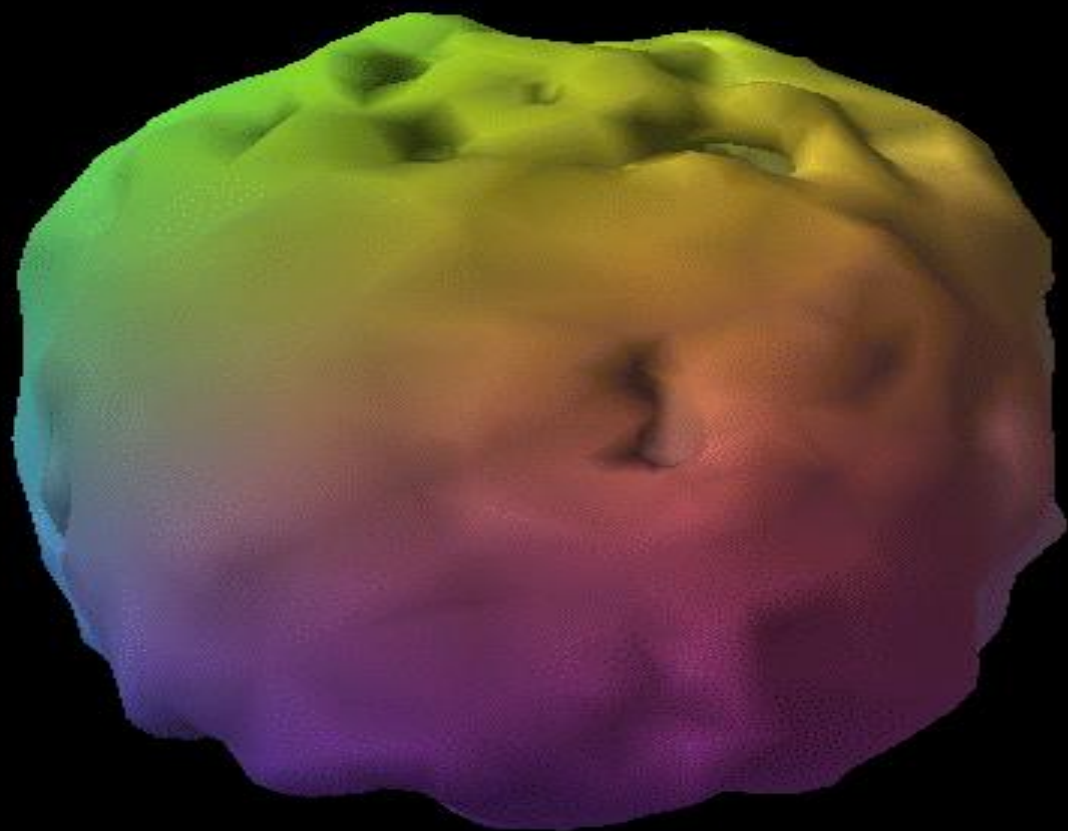
FEAR

ANXIETY

INCREASED IMPULSIVITY

EARLY LIFE DEVELOPMENTAL TRAUMA SELF AND IDENTITY

- **Disorganized attachment themes**
 - **COHERSIVE CONTROL**
 - **Blame**
 - **Rejection**
 - **Intrusion**
 - **Hostility**
- **Borderline Personality Disorder**



EARLY AND PERSISTENT ALCOHOL/DRUG ABUSE

- **GENETICS**

- **A1 ALLELE OF THE DOPAMINE D2 RECEPTOR GENE**

- **FOUND IN ONE-THIRD OF POPULATION**
 - **LOW DOPAMINE TONE**

- **G ALLELE(A118G) OF THE OPRM1 MU OPIOID RECEPTOR GENE**

- **ASSOCIATED WITH ALCOHOL MISUSE DURING TEEN YEARS**
 - **CAUSES INCREASE IN PLEASURE AND INTOXICATION AFTER DRINKING**
 - **NALTREXONE EFFECT MORE PRONOUNCED WITH THOSE CARRYING THIS POLYMORPHISM**

- ATTCNETWORK.ORG/.../ASMEDETAILS.ASP?ID=...

EARLY AND PERSISTENT ALCOHOL/DRUG ABUSE

- **REDUCED OR LOW DA TONE**
 - *ANHEDONIC RELATIVE TO THOSE AROUND THE INDIVIDUAL*
 - SENSE OF NOT FITTING IN
 - POOR ATTENTION
 - POOR LEVEL OF MOTIVATION
 - RESTLESS
 - IRRITABLE
 - DISCONTENTED

EARLY AND PERSISTENT ALCOHOL/DRUG ABUSE

RELAPSE FALLS ALONG A SPECTRUM

PFC

- **COMPULSIVE RELAPSE**
- **PREFRONTAL CORTEX OFF-LINE**

PFC

- **REGULATED RELAPSE**
- **SOME PREFRONTAL AVAILABILITY**

PFC

- **LITTLE OR NO RELAPSE**
- **PREFRONTAL CORTEX AVAILABLE**

EARLY AND PERSISTENT ALCOHOL/DRUG ABUSE



RECOVERY

- PREFRONTAL CORTEX

ADDICTION

- MIDBRAIN
- LIMBIC

ACUTE
ABSTINENCE

- BRAIN STEM
- LOCUS COERULEUS

VULNERABILITY TO EFFECTS OF DRINKING

- We compared twin siblings who differ in their use of alcohol during adolescence, but who share both their genes and their family and neighborhood environments. By doing so, we could eliminate familial and genetic confounds that have constrained inferences drawn from earlier studies. To my knowledge, ours is the first prospective study of discordant twin pairs..**

VULNERABILITY TO EFFECTS OF DRINKING

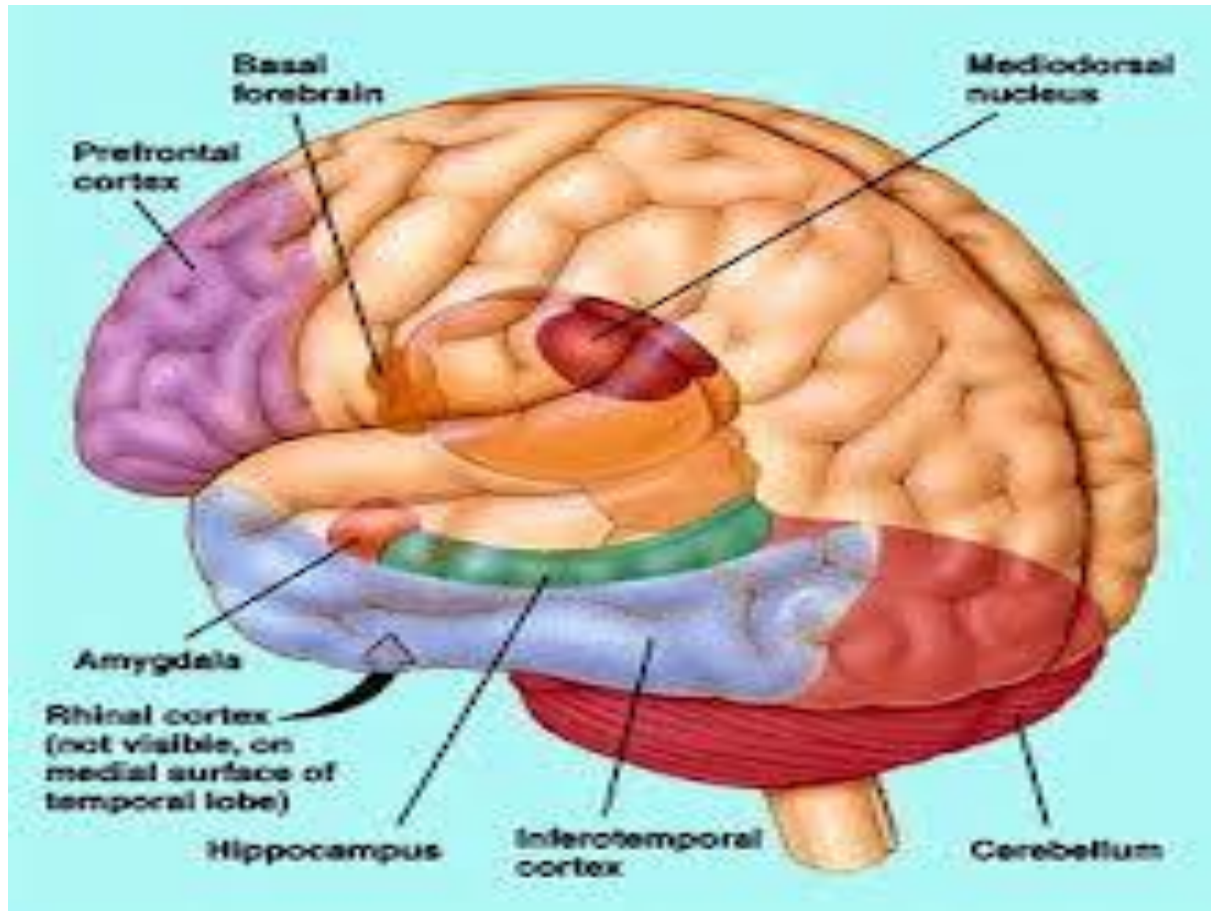
- **It is, accordingly, the first to evaluate whether the established association of adolescent drinking problems with adverse adult outcomes can be fully explained by shared genetic and environmental liabilities**
- **What causes associations between adolescent drinking and adverse adult outcomes such as continued substance abuse, truncated education, risky sex, and downward social mobility?**

VULNERABILITY TO EFFECTS OF DRINKING

- **Some adolescents appear to be especially vulnerable to long-term effects of alcohol-exposure. And if there is a causal relationship between abusive adolescent drinking and later behavioral problems -- as is here suggested -- prevention efforts should be focused on identifying adolescents who are vulnerable and directly address what may be long-term and cumulative harmful consequents of adolescent alcohol exposure.**

Richard J. Rose, Torsten Winter, Richard J. Viken, Jaakko Kaprio. **Adolescent Alcohol Abuse and Adverse Adult Outcomes: Evaluating Confounds with Drinking-Discordant Twins.** *Alcoholism: Clinical and Experimental Research*, 2014; DOI: [10.1111/acer.12491](https://doi.org/10.1111/acer.12491)

THE PREFRONTAL CORTEX AND NEUROPLASTICITY



THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **CRITICALLY SENSITIVE TO AN ENRICHED ENVIRONMENT DURING THE FOLLOWING AGE RANGES**
 - **0-5 YEARS OLD**
 - **10-20 YEARS OLD**
- **TAKES ABOUT 25 YEARS TO DEVELOP UNDER GOOD ENVIRONMENTAL CIRCUMSTANCES**

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **COORDINATE THE MANY BRAIN ACTIVITIES NEEDED TO UTILIZE:**
 - ***EXECUTIVE FUNCTIONS***
 - Set goals
 - Make plans to attain those goals
 - Organize steps to carry out the plans
 - Ensure that desired outcomes are achieved
 - ***CONSCIENCE***
 - ***PURSUE REWARD WITHIN THE LAW***

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

Executive Functions

- ***Abstract Thinking***
 - Discerning relationships
 - “Seeing the forest for the trees”
- ***Attention Shifting***
 - Ability to shift attention when needed
- ***Information Manipulation***
 - Manipulate information in short-term memory

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

Executive Functions

- ***Planning And Foresight***
 - Forming a mental model of a future event or situation
- ***Monitoring And Error Correction***
 - Engaged when results do not match intentions
- ***Decision Making***
 - Weigh options, arrive at a decision and see it through

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

Executive Functions

- ***Inhibition***
 - Ability to inhibit impulses and delay gratification
- ***Social Functioning***
 - Appropriate processing of social cues

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **HUMANS CREATE NEW NEURONS IN AREAS OF THE BRAIN INVOLVED IN NEW LEARNING**
 - **AMYGDALA**
 - **HIPPOCAMPUS**
 - **CORTEX**
 - **STRIATUM**
- **THE CORTEX IS FIRST ORGANIZED BY OUR EXPERIENCE AND THIS ORGANIZES OUR INTERACTIONS WITH THE WORLD**

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **PREADOLESCENT AND ADOLESCENT NEUROBIOLOGICAL THEMES**
 - **BRAIN CELLS, CONNECTIVITY, RECEPTORS AND NEUROTRANSMITTERS PEAK IN CHILDHOOD AND ARE REDUCED DURING ADOLESCENCE**
- **CONNECTIVITY AMONG BRAIN REGIONS INCREASE**
- **BALANCE BETWEEN FRONTAL (EXECUTIVE CONTROL) AND LIMBIC (EMOTIONAL CONTROL) CHANGES**

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **COGNITIVE ADVANCES DUE TO FASTER COMMUNICATION AND INCREASED INTEGRATION**
- **MYELINATED AXONS TRANSMIT IMPULSES UP TO 100 TIMES FASTER AND DECREASE RECOVERY TIME**
- **PREFRONTAL LOBE CIRCUITRY INCREASES**
 - **ABILITY TO DELAY GRATIFICATION**
 - **ABILITY TO UTILIZE EXECUTIVE FUNCTIONING**

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- MODULATION RATIO
 - IN ORDER TO USE THE COGNITIVE AND BEHAVIORAL STRATEGIES WANT CLIENT TO HAVE:

INHIBITION
EXCITATION

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **BRAIN AT ALL AGES IS RESPONSIVE TO ENVIRONMENTAL STIMULI**
- **SYNAPSES CAN CHANGE IN MINUTES WHEN STIMULATED**
- **NEUROPLASTICITY IS MODULATED BY**
 - **GENETIC FORCES**
 - **EPIGENETIC FORCES**
- **THESE FACTORS INFLUENCE THE EXPRESSION OF GENES WITHOUT CHANGING THE DNA SEQUENCE**

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **CRITICAL PERIODS**
 - **BRAIN SYSTEMS REQUIRE ENVIRONMENTAL STIMULI TO DEVELOP PROPERLY**
 - **EACH NEURONAL SYSTEM HAS A DIFFERENT CRITICAL PERIOD IN WHICH IT IS ESPECIALLY PLASTIC AND SENSITIVE TO ENVIRONMENT**
 - **DURING THE CRITICAL PERIOD THERE IS RAPID AND FORMATIVE GROWTH**
 - **EXAMPLE-LANGUAGE IS FROM INFANCY TO BETWEEN 8 YO AND PUBERTY**

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **CRITICAL PERIODS**
 - **AUDITORY PROCESSING PROBLEMS LEAD TO WEAKNESSES IN ALL LANGUAGE TASKS INCLUDING VOCABULARY, COMPREHENSION, SPEECH, READING AND WRITING**
 - **EXAMPLE-AUTISM HAS INCREASED BY A MULTIPLE OF AT LEAST 3 OVER THE PAST 15 YEARS. IT COULD WELL BE THAT THE AUDITORY PROCESSING CRITICAL PERIOD SHUT DOWN PREMATURELY**
 - **INCREASED INCIDENCE OF AUTISM IN NOISY AREAS SUCH AS LIVING NEXT TO A BUSY FREEWAY OR AN AIRPORT LEAVING AN UNDIFFERENTIATED AUDITORY BRAIN MAP**

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **CRITICAL PERIODS**
 - **THERE IS A DIFFERENCE BETWEEN CRITICAL PERIOD PLASTICITY AND ADULT PLASTICITY**
 - **CRITICAL PERIOD PLASTICITY ALLOWS FOR BRAIN MAPS TO BE CHANGED JUST BY BEING EXPOSED TO THE WORLD (ENVIRONMENT) BECAUSE THE LEARNING MACHINERY IS ALWAYS ON**
 - **THIS LEARNING MACHINERY INVOLVES THE NUCLEUS BASALIS (ACETYLCHOLINE)**
 - **ALLOWS US TO FOCUS OUR ATTENTION AND KEEP IT FOCUSED THROUGHOUT THE ENTIRE CRITICAL PERIOD (“TUNE IN”)**
 - **ALSO HELPS US REMEMBER WHAT WE EXPERIENCE (TO FORM SHARP MEMORIES)**
 - **ALLOWS FOR MAP DIFFERENTIATION**

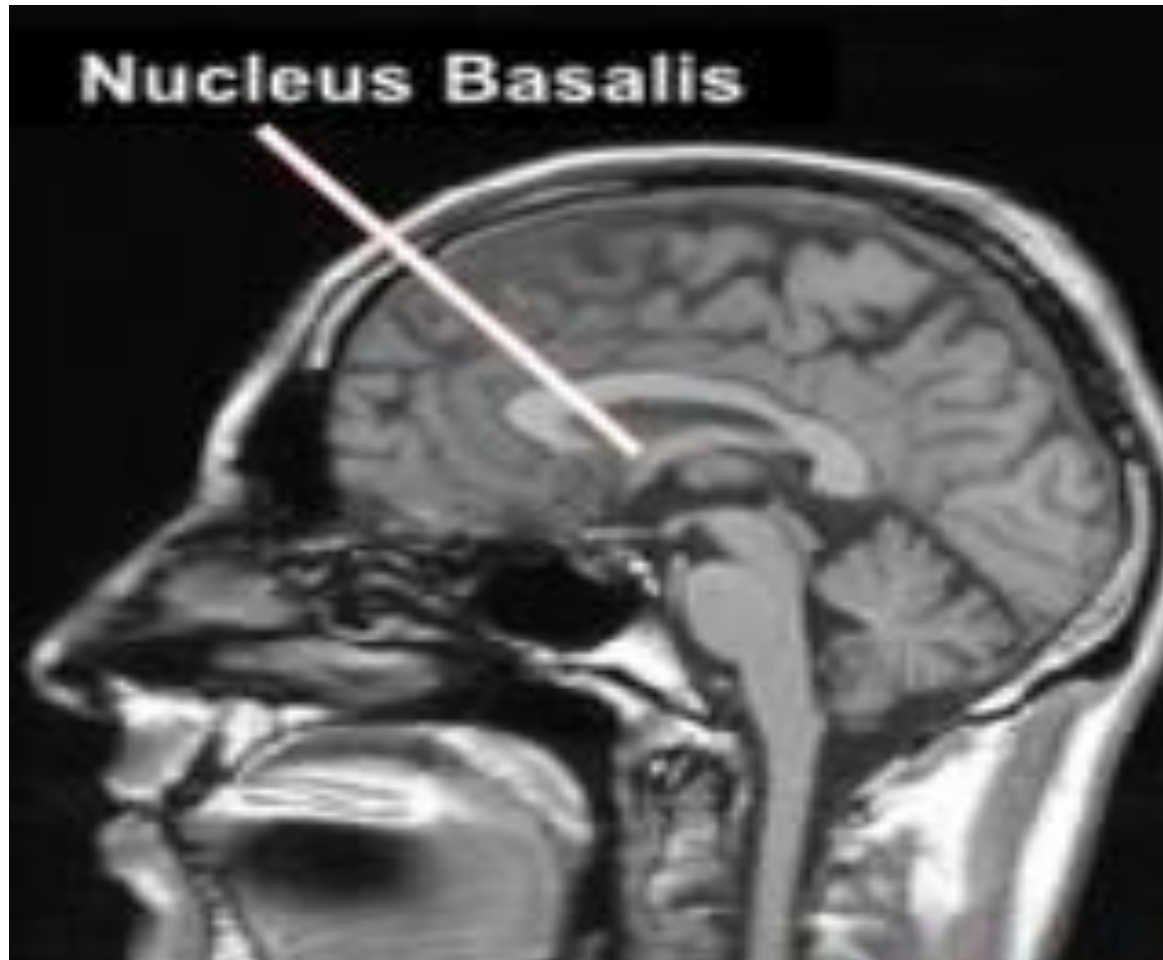
THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **CRITICAL PERIODS**
 - **BRAIN-DERIVED NEUROTROPHIC FACTOR (BDNF) REINFORCES PLASTIC CHANGES MADE IN THE BRAIN DURING CRITICAL PERIODS**
 - **WHEN YOU PERFORM AN ACTIVITY THAT REQUIRES SPECIFIC NEURONS TO FIRE TOGETHER, THEY RELEASE BDNF**
 - **BDNF CONSOLIDATES THE CONNECTION BETWEEN THE NEURONS AND HELPS TO WIRE THEM TOGETHER SO THEY FIRE TOGETHER RELIABLY IN THE FUTURE**

THE PREFRONTAL CORTEX AND NEUROPLASTICITY

- **CRITICAL PERIODS**
 - BDNF PROMOTES THE GROWTH OF MYELIN
 - DURING CRITICAL PERIODS BDNF TURNS ON THE *NUCLEUS BASALIS* ALLOWING MAP DIFFERENTIATION AND CHANGE TO TAKE PLACE EFFORTLESSLY
 - WHEN STRENGTHENING OF THE KEY CONNECTIONS IS COMPLETE, BDNF HELPS CLOSE DOWN THE CRITICAL PERIOD

THE PREFRONTAL CORTEX AND NEUROPLASTICITY



NEUROPLASTICITY

- **CRITICAL PERIODS**
 - ***AFTER THE CRITICAL PERIOD ENDS, THE NUCLEUS BASALIS CAN ONLY BE ACTIVATED WHEN SOMETHING IMPORTANT, SURPRISING, OR NOVEL OCCURS OR IF WE MAKE A CONCERTED EFFORT TO PAY CLOSE ATTENTION***

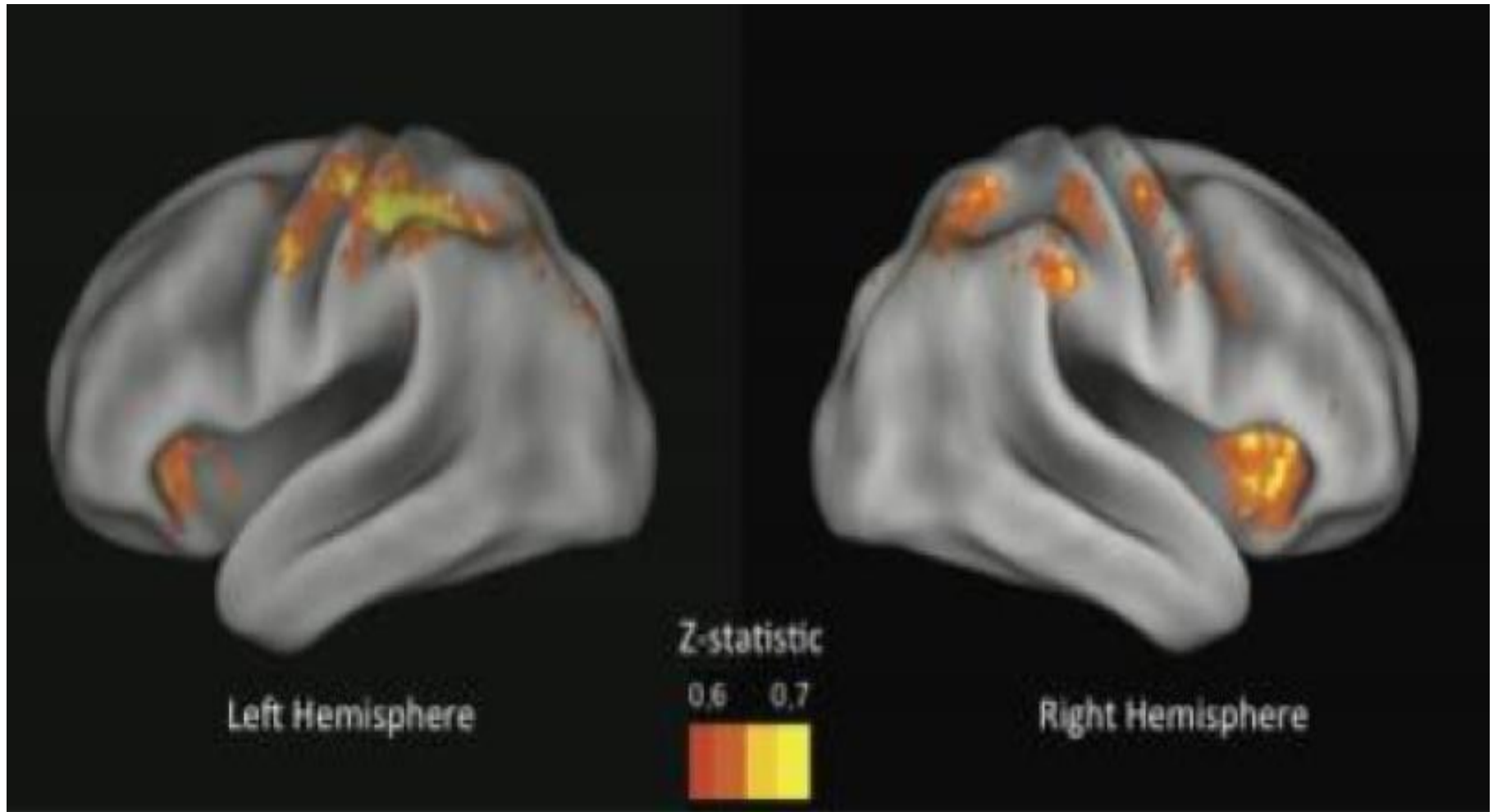
RISKY BEHAVIOR

- **Researchers from The University of Texas at Austin, UCLA and elsewhere analyzed data from 108 subjects who sat in a magnetic resonance imaging (MRI) scanner -- a machine that allows researchers to pinpoint brain activity in vivid, three-dimensional images -- while playing a video game that simulates risk-taking.**

RISKY BEHAVIOR

- **When the researchers trained their software on much smaller regions of the brain, the regions typically involved in executive functions such as control, working memory and attention was enough to predict a person's future choices. Researchers concluded, when we make risky choices, it is primarily because of the failure of our control systems to stop us.**

RISKY BEHAVIOR



RISKY BEHAVIOR

- **External factors, such as peer pressure, lack of sleep, poverty or hunger weaken the activity of our brains' control systems when we contemplate risky decisions.**

S. M. Helfinstein, T. Schonberg, E. Congdon, K. H. Karlsgodt, J. A. Mumford, F. W. Sabb, T. D. Cannon, E. D. London, R. M. Bilder, R. A. Poldrack. **Predicting risky choices from brain activity patterns.** *Proceedings of the National Academy of Sciences*, 2014; DOI: [10.1073/pnas.1321728111](https://doi.org/10.1073/pnas.1321728111)

RISKY BEHAVIOR

- **A pattern of questionable decision-making in dire situations comes to light in teen mortality. New research from the Center for BrainHealth at The University of Texas at Dallas investigating brain differences associated with risk-taking teens found that connections between certain brain regions are amplified in teens more prone to risk.**

RISKY BEHAVIOR

- **Risk-taking teens exhibit hyperconnectivity between the amygdala, a center responsible for emotional reactivity, and specific areas of the prefrontal cortex associated with emotion regulation and critical thinking skills. The researchers also found increased activity between areas of the prefrontal cortex and the nucleus accumbens, a center for reward sensitivity that is often implicated in addiction research**

RISKY BEHAVIOR

- **Our brains have an emotional-regulation network that exists to govern emotions and influence decision-making. Antisocial or risk-seeking behavior may be associated with an imbalance in this network.**

Samuel J. DeWitt, Sina Aslan, Francesca M. Filbey. **Adolescent risk-taking and resting state functional connectivity.** *Psychiatry Research: Neuroimaging*, 2014; 222 (3): 157
DOI: [10.1016/j.psychresns.2014.03.00](https://doi.org/10.1016/j.psychresns.2014.03.00)

RISKY BEHAVIOR

- **Studies are beginning to challenge the traditional concept that the teenage brain can't plan because of an immature prefrontal cortex.**
- **Findings indicate that the teen prefrontal cortex is not much different than in the adult, but it can be easily overruled by heightened motivation centers in the brain.**

RISKY BEHAVIOR

- **You have this mixture of newly gained executive control plus extra reward that is pulling the teenager toward immediate gratification.**

University of Pittsburgh Schools of the Health Sciences. "Exploring the teenage brain, and its drive for immediate reward." ScienceDaily.

ScienceDaily, 14 February 2015.

www.sciencedaily.com/releases/2015/02/150214184523.htm.

SOLUTIONS

- **LAW OF SENSITIVE DEPENDENCE ON INITIAL CONDITIONS**
- **PLACEBO EFFECT**
- **ENRICHED ENVIRONMENT**
- **UNDERSTANDING SELF**
- **EDUCATION**
- **WELLNESS**
- **SPIRITUAL GROWTH**
- **MINFULLNESS AND YOGA**
- **TRANSITION PROGRAMS**

LAW OF SENSITIVE DEPENDENCE ON INITIAL CONDITIONS

- **Nonlinear quantum dynamics**
- **A small variation in a pattern of inputs can result in a very large change in eventual outputs**
- **Example: Negative worldview can result in a repetitive change in energy to various body organs. Over time this might be realized as disease**

LAW OF SENSITIVE DEPENDENCE ON INITIAL CONDITIONS

- **Consists of thought patterns and resulting habitual responses involving**
 - **Persistence**
 - **Repetition**
- **If correct, then disease could be reversible by changing thought patterns and resulting change in habitual response**
- **Example: Decide to go to AA meetings. With persistence and dedication a larger personality change is observed**

THE PLACEBO EFFECT

There is no one "the placebo effect." Think of it as an attachment relationship. There are different mechanisms in play across a variety of medical conditions and therapeutic interventions. For example, *a placebo effect takes place because there is expectation.* The patient expects a therapeutic benefit, and this kind of expectation actually has an effect on the brain and the body.

THE PLACEBO EFFECT

The connection between expectation and *real improvement that may occur is due at least to two mechanisms. The first may be a reduction of anxiety. The second is between expectation and the activation of a reward mechanism by the region of the brain known as the nucleus accumbens (which also governs pleasure, reinforcement learning, laughter, addiction, aggression, fear, impulsivity and the placebo effect.)*

THE PLACEBO EFFECT

When a treatment is given to a patient, be it a placebo or real, it is administered in *a complex set of psychological states that vary from patient to patient and from situation to situation*. For example, when a placebo is given to relieve pain, it is administered along with stimuli which tell the patient that a clinical improvement should be occurring shortly. These stimuli can include the color and shape of the pill, patient and provider characteristics and the healthcare setting.

THE PLACEBO EFFECT

Recent research has revealed a reduced efficacy of drugs when they are administered covertly to the patient. In fact, if the placebo/expectation component of a treatment is eliminated by means of a hidden administration (unbeknownst to the patient), the psychological component of the therapy is absent as well

American Physiological Society (APS) (2013, September 19). Placebo effect and lessons for the physician-patient relationship. *ScienceDaily*.

ENRICHED ENVIRONMENT

**A GOOD PARENT SETS GOOD
LIMITS**

***FAIR
CONSISTENT
AVAILABLE***

ENRICHED ENVIRONMENT

SETTING LIMITS

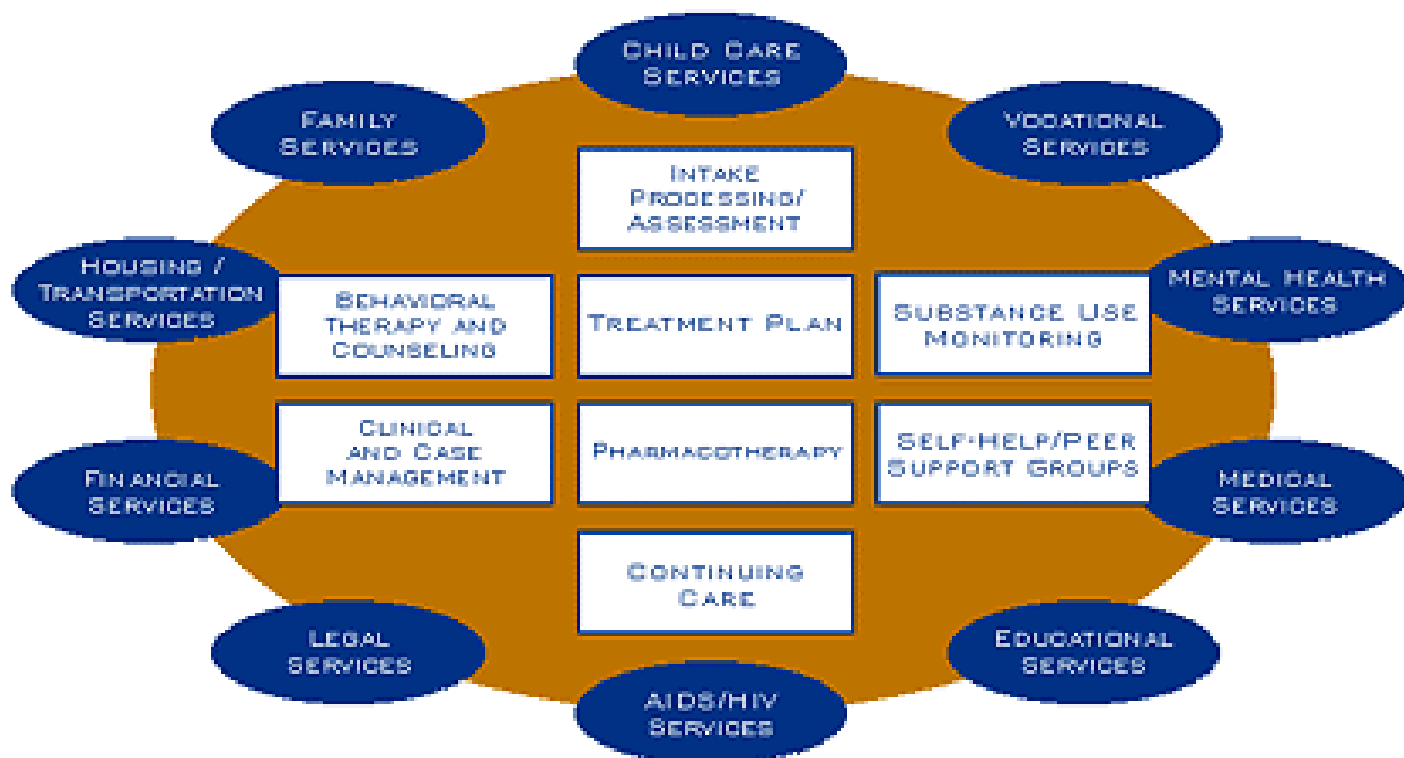
Too Strict

To Loose

ENRICHED ENVIRONMENT

- **SAFE AND SUPPORTIVE RELATIONSHIPS ARE THE OPTIMAL ENVIRONMENT FOR SOCIAL AND EMOTIONAL LEARNING**
- **EMPATHIC ATTUNEMENT = NURTURANCE = SECURE ATTACHMENT**
- **BY CREATING AN ENVIRONMENT OF NURTURANCE AND ACCEPTANCE THE THERAPIST CREATES THE OPTIMAL POSSIBILITY FOR LEARNING BOTH COGNITIVELY AND EMOTIONALLY ALLOWING THE *BIOLOGICAL PLAN* AND NEUROPLASTICITY TO DO ITS JOB**

ENRICHED ENVIRONMENT



ENRICHED ENVIRONMENT

***CAN YOU REMEMBER AN EXPERIENCE
WHEN SOMEONE (A CLIENT, FRIEND
OR CHILD) CAME TO YOU WITH AN
UNSOLVABLE PROBLEM AND IN
YOUR PRESENCE CAME UP WITH
THE SOLUTION WITHOUT YOU
SAYING A WORD?***

ENRICHED ENVIRONMENT

- **RECOGNITION AND EXPRESSION OF EMOTION**
- **NONVERBAL EMOTIONAL EXPRESSION**
- **RH TO RH AFFECTIVE COMMUNICATION EQUALS THE RELATIONAL UNCONSCIOUS**
- **UNCONSCIOUS RH IMPLICIT SELF CONTINUOUSLY APPRAISES LIFE EXPERIENCES AND RESPONDS ACCORDING TO ITS SCHEME OF INTERPRETATION**

ENRICHED ENVIRONMENT

- **ONE UNCONSCIOUS MIND COMMUNICATES WITH ANOTHER UNCONSCIOUS MIND**
- **RH RESPONDS QUICKLY TO ALL STIMULI**
- **IMPLICIT LEVEL OF THE THERAPEUTIC ALLIANCE (BENEATH THE EXPLICIT COGNITIONS AND LANGUAGE) ARE THE CORE OF THE CHANGE MECHANISM AT THE UNCONSCIOUS LEVEL**

ENRICHED ENVIRONMENT

- **INVOLVES CO-CREATION OF AN INTERSUBJECTIVE CONTEXT THAT FACILITATES THE PROCESS OF CHANGE (ATTACHMENT COMMUNICATION)**
- **ATTACHMENT COMMUNICATION REPRESENTS RH TO RH TRANSACTION THAT FACILITATE THE EXPERIENCE DEPENDENT MATURATION OF RH**

ENRICHED ENVIRONMENT

- **EMOTIONAL AVAILABILITY OF CAREGIVER IN INTIMACY SEEMS TO BE THE CENTRAL GROWTH PROMOTING FACTOR IN EARLY REARING EXPERIENCE**
- **CAREGIVER MAXIMIZES POSITIVE AFFECT AND MINIMIZES NEGATIVE AFFECT**
- **PROMOTES INCREASED TOLERANCE FOR POSITIVE AND NEGATIVE AFFECT (AFFECTIVE RANGE)**

ENRICHED ENVIRONMENT

- **THE BROADER THE RANGE OF EMOTIONS THAT A CHILD EXPERIENCES THE BROADER WILL BE THE EMOTIONAL RANGE OF THE SELF THAT DEVELOPES**
- **THERAPEUTIC ALLIANCE**
 - **THERAPIST'S FACILITATING BEHAVIORS COMBINE WITH THE PATIENTS CAPACITY FOR ATTACHMENT TO PERMIT DEVELOPMENT OF ALLIANCE (PRIMARY COMPONENT OF EMOTIONAL BOND)**

ENRICHED ENVIRONMENT

- **THERAPEUTIC ALLIANCE (CONTINUED)**
 - **KEY IS HOW TO BE SUBJECTIVELY WITH PATIENT ESPECIALLY DURING AFFECTIVELY STRESSFULL MOMENTS**
 - **UNCONSCIOUS INTERSUBJECTIVE PROCESSES INCLUDE EMPATHY, IDENTIFICATION WITH OTHERS AND SELF-AWARENESS**
 - **FACIAL EXPRESSIONS CAN BE APPRAISED BY THE RH WITHIN 30 MILLISECONDS**
 - **MAY TAKE HOURS TO DAYS TO GET INTENSE REACTION BACK TO BASE LINE**

ENRICHED ENVIRONMENT

- **MUST BE ATTENTIVE TO LH PATIENT VERBALIZATIONS IN ORDER TO OBJECTIVELY DIAGNOSE AND UNDERSTAND PATIENTS DYSREGULATED SYMPTOMS**
- **BUT ALSO ATTENTIVE INTERSUBJECTIVELY TO RELATIONAL TRANSACTIONS (REFLECT EMOTIONS SUCH AS APPROVAL/DISAPPROVAL, SUPPORT, HUMOR AND FEAR)**
 - **FACIAL EXPRESSIONS**
 - **BODY POSTURE**
 - **TONE AND TEMPO OF VOICE**

ENRICHED ENVIRONMENT

- **CARL ROGERS (1986)**

“AS A THERAPIST, I FIND THAT WHEN I AM CLOSEST TO MY INNER, INSTINCTIVE SELF, WHEN I AM SOMEHOW IN TOUCH WITH THE UNKNOWN IN ME, WHEN PERHAPS I AM IN A SLIGHTLY ALTERED STATE OF CONSCIOUSNESS IN THE RELATIONSHIP, THEN WHATEVER I DO SEEMS FULL OF HEALING.”

UNDERSTANDING SELF

- **THERE IS A HEALING POWER INSIDE OF ALL OF US**
- **IT CAN BE CALLED THE SELF, SOUL, GOD IMMANENT, ATMAN, ETC.**
- **WHEN ONE REALIZES THIS ENERGY IT ALLOWS ONE TO BE ABLE TO SEE THE SELF INSIDE OF THOSE WHO CANNOT SEE IT INSIDE OF THEMSELVES**
- **THIS REDUCES THEIR PAIN**

UNDERSTANDING SELF

- **WE CANNOT CHANGE THE WORLD BY ALTERING SOCIAL, POLITICAL, ECONOMIC AND EDUCATIONAL STRUCTURES (CULTURE)**
- **THE MINDS OF MEN AND WOMEN CREATED CULTURE**
- **THEREFORE, WE MUST CHANGE OURSELVES
TO A POINT OF UNCONDITIONAL LOVE AND
A TRUE UNDERSTANDING OF “ONENESS”**

11.95

POGO:

**WE HAVE MET
THE ENEMY
AND HE IS US**



Walt Kelly

What, Me Worry?



UNDERSTANDING SELF

- **HUMAN DEVELOPMENT IS A NATURAL GOD-GIVEN PROCESS THAT THRIVES WHEN SURROUNDED BY UNCONDITIONAL LOVE**
- **WE ARE LED TO BELIEVE BY OUR CULTURE THAT DEVELOPMENT IS ABOUT PREDICTION AND CONTROL WHICH VIOLATE NATURES DESIGN FOR DEVELOPMENT**

UNDERSTANDING SELF

- **THIS CREATES ANXIETY AS A NORMAL STATE WITH OUR ENERGY GOING TOWARD PROBLEM-SOLVING OF SOCIETIES ILLS**
 - **UNDER THIS SYSTEM THE BRAIN DOES NOT DEVELOP ITS FULL POTENTIAL**
 - **ALL EFFORT IS TOWARD REMOVING THE CAUSES OF OUR ANXIETY**
 - **THIS ISOLATES US FROM THE SOURCE OF OUR POWER (CONSCIOUSNESS AND INSIGHT)**

UNDERSTANDING SELF

- LEAVING US CONVINCED THAT OUR THINKING IS NECESSARY AND SUFFICIENT TO SOLVE THESE PROBLEMS
- *THE SOLUTION IS NO SOLUTION*
 - *MUST TURN AWAY FROM PROBLEMS AND FOCUS ON THE BIOLOGICAL PLAN FOR DEVELOPMENT*
 - *FOCUS ON PERSONAL-SPRITUAL-BIOLOGICAL DEVELOPMENT*
- UNFORTUNATELY WE FEAR THIS UNKNOWN SINCE WE CAN NEITHER PREDICT OR CONTROL IT
 - THE UNKNOWN IS INSIGHT-INTELLIGENCE

UNDERSTANDING SELF

- **ONCE THE SHIFT IS MADE FROM ERROR-CORRECTION TO REALIGNMENT OF THE GOD GIVEN PLAN, ERROR ISN'T SOMETHING TO CORRECT ANYMORE**
 - **ERROR IS A DEVIATION FROM THE COURSE**
 - ***THE BIOLOGICAL PLAN BECOMES THE FOCAL POINT REPLACING ERROR-CORRECTION IN FAVOR OF COURSE-CORRECTION***

UNDERSTANDING SELF

- **WITH ERROR-CORRECTION WE CAN OBSERVE THE FOLLOWING:**
 - **NOTHING WORKS**
 - **EVERYTHING TOUCHED BY ERROR-CORRECTION TURNS TO DUST AND ASHES**
 - **FAULT-FINDING AND LUST FOR THE SCAPEGOAT'S BLOOD ABOUND AND THE INSANITY OF THE SYSTEM GOES UNTOUCHED**

UNDERSTANDING SELF

TWO THINGS:

- **WE ARE NEITHER GUILTY OF ERROR NOR CALLED TO CORRECT IT**
 - *WE ARE CALLED TO BECOME OUR SELF*
- **THE PLAN OF LIFE IS BUILT INTO US AND ITS TRUTH CAN NEVER BE REMOVED; IT CAN ONLY BE COVERED OVER**
 - **THE TRUTH IS OUR EVER-PRESENT ALIGNMENT WITH THE WHOLE; THE TRUTH OF OUR REAL SELF IS GOD HIMSELF, THE PERFECTION OF OUR DIVINE BEING**

UNDERSTANDING SELF

- **ALIGNMENT MEANS MOVING AWAY FROM THE EGO AND ENCULTURATION**
- **ALIGNMENT IS THE SPIRITUAL COURSE**
- ***WE HAVE THE NAVIGATOR WITHIN US***
- **TO BE FREE OF GUILT AND AT ONE WITH THE UNIVERSAL SYSTEM IS TO BE FREE OF ANXIETY**
- **YOU CAN CONTROL SOMEONE ONLY THROUGH THEIR ANXIETY**

EDUCATION

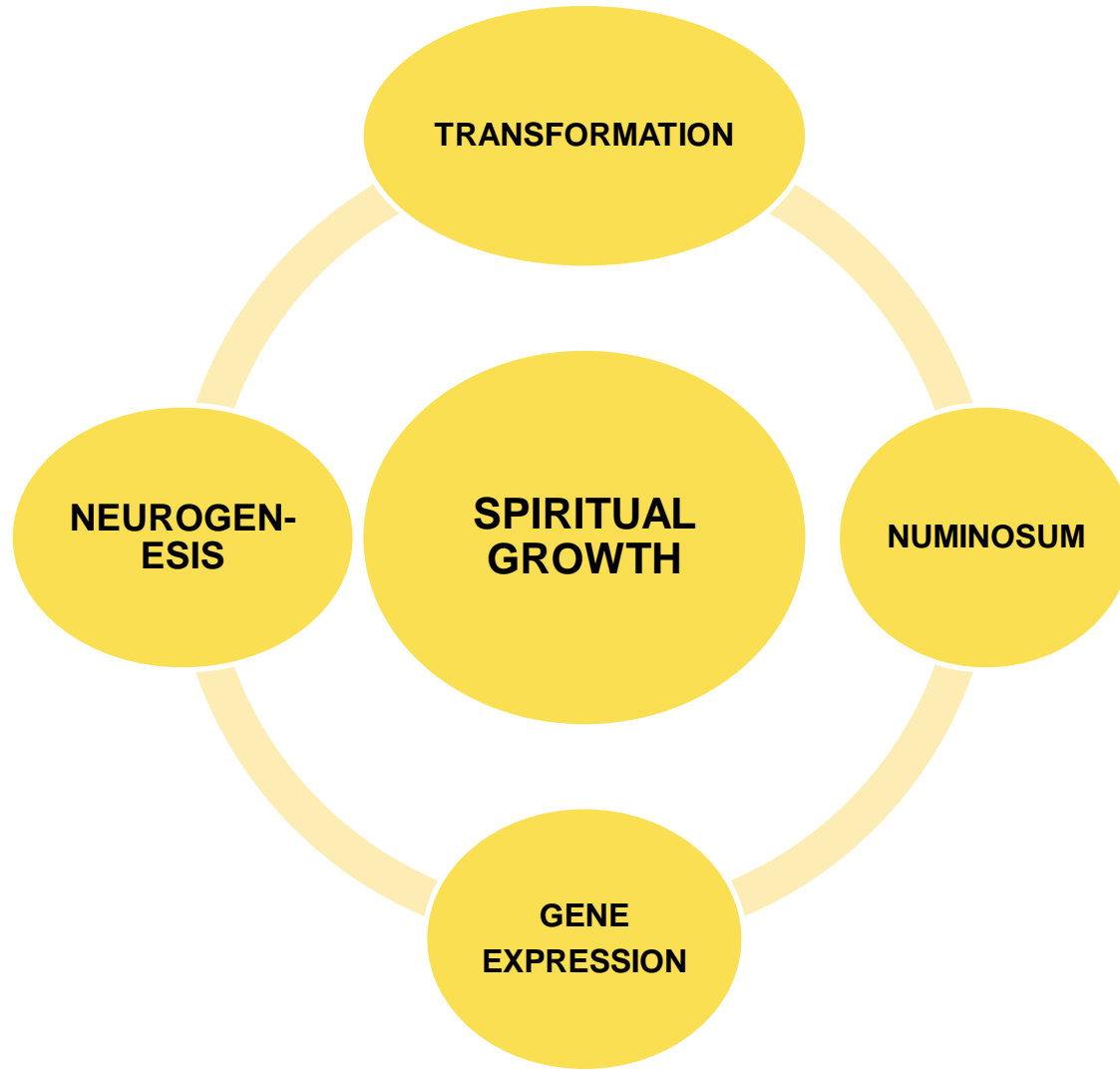
I THINK.....

I FEEL.....

I LEARNED.....

MY FUTURE BEHAVIOR WILL CHANGE...

UNCONDITIONAL REGARD



CONSCIOUSNESS TO NOVELTY- NUMINOSUM

- **THE NOVEL**
- **A HEALTHY STAFF**
- **LOVE AND KINDNESS**
- **Spiritual study and understanding of
the relatedness of everything (context)
leads to novelty-numinosum**

NOVELTY-NUMINOSUM TO GENE EXPRESSION

- THE EXPERIENCE OF AWE,
FASCINATION AND NOVELTY**
- THAT WHICH IS SURPRISING,
UNKNOWN AND UNPREDICTED
GARNERS OUR ATTENTION AND
MOTIVATES OUR LIVES LEADING TO
CHANGE IN GENE EXPRESSION**

GENE EXPRESSION TO NEUROGENESIS (EPIGENESIS)

- **PSYCHOBIOLOGY INTEGRATES EXPERIENCES OF THE MIND (AWARENESS OF NOVELTY WITH THE AROUSAL/MOTIVATIONAL ASPECTS OF THE NUMINOSUM) WITH BIOLOGY (GENE EXPRESSION AND PROTEIN SYNTHESIS TO CREATE NEUROGENESIS)**

HEALING

MINDFULNESS AND YOGA

- **Mindfulness training, a meditation-based therapy, can improve attention skills in incarcerated youth, paving the way to greater self-control over emotions and actions. It is the first study to show that mindfulness training can be used in combination with cognitive behavioral therapy to protect attentional functioning in high-risk incarcerated youth.**
- **"Mindfulness meditation can be seen as involving two components: self-regulation of attention and non-judgmental awareness**

MINDFULNESS AND YOGA

- **267 incarcerated males, ages 16 to 18, over a 4-month period. The researchers found that participation in an intervention that combined cognitive behavioral therapy with mindfulness training (or "CBT/MT"), called Power Source, had a protective effect on youths' attentional capacity.**
- **The CBT/MT approach responds to the significant childhood psychosocial hardships that most incarcerated youths have experienced, including exposure to violence, poverty, and physical and emotional abuse by caregivers**

MINDFULNESS AND YOGA

- **These experiences impair cognitive control processes, such as attention regulation, which is vital for the self-regulation of feelings and actions. The antisocial behavior prevalent among youthful offenders is the result of an ongoing interplay between this psychosocial adversity and deficits in cognitive control processes, particularly attention."**
- **Improving attention can lead to better self-control**

New York University (2013, October 31). Study on incarcerated youth shows potential to lower anti-social behavior. *ScienceDaily*. Retrieved November 2, 2013.

YOUNG OFFENDER REENTRY PROGRAMS

- **100,000 youths return to community from secured facilities each year**
- **63% will commit another offense prior to one year**
- **60-70% of youth involved in criminal activity are substance abusers**
- **Only 1 in 10 of these have access to substance abuse treatment**

YOUNG OFFENDER REENTRY PROGRAMS

- **KEY AREAS**

- **ABSTINENCE**

- Percentage reporting non-use in last month increased 12%

- **EMPLOYMENT AND EDUCATION**

- Percentage reporting current employment or being in school increased 2%

- **STABLE HOUSING**

- Percentage reporting a permanent place to live rose 102% from 20% to 41%

YOUNG OFFENDER REENTRY PROGRAMS

- **Rochester, NY project for 18-24 year olds**
 - **Recidivism rate dropped from 80% to 14%**
 - **Case managers begin 3-6 months prior to discharge developing a “TRANSITION PLAN”**
 - **Trusting Relationships**
 - **Pre-release activities**
 - **Basketball teams**
 - **Current events classes**
 - **Post-release activities**
 - **GED**
 - **Employment assistance**
 - **Substance abuse and mental health continuing care**

GUILT OR SHAME

- **Within three years of being released from jail, two out of every three inmates in the US wind up behind bars again -- a problem that contributes to the highest incarceration rate of any country in the world. New research suggests that the degree to which inmates' express guilt or shame may provide an indicator of how likely they are to re-offend.**

GUILT OR SHAME

- **The findings show that inmates who feel guilt about specific behaviors are more likely to stay out of jail later on, whereas those that are inclined to feel shame about the self might not.**
- **When people feel guilt about a specific behavior, they experience tension, remorse, and regret. Research has shown that this sense of tension and regret typically motivates reparative action -- confessing, apologizing, or somehow repairing the damage done."**

GUILT OR SHAME

- **Feelings of shame, on the other hand, involve a painful feeling directed toward the self. For some people, feelings of shame lead to a defensive response, a denial of responsibility, and a need to blame others -- a process that can lead to aggression.**
- **Proneness to guilt predicts less recidivism -- a lower likelihood of re-offense**

GUILT OR SHAME

- **Inmates inclined to feel shame, and who were also defensive and blameful of others, were more likely to slip back into crime. Inmates who were shameful but who *didn't* blame others were less likely to end up in jail again.**

J. P. Tangney, J. Stuewig, A. G. Martinez. **Two Faces of Shame: The Roles of Shame and Guilt in Predicting Recidivism.** *Psychological Science*, 2014; DOI:[10.1177/0956797613508790](https://doi.org/10.1177/0956797613508790)

SUCCESSFUL TRANSITION

- **Roughly two-thirds of former inmates in the U.S. eventually return to prison, some for committing crimes and others for probation violations**
- **Subjects of the research were convicted of felony crimes and had remained out of prison for at least two years after their release**

SUCCESSFUL TRANSITION

- **Research focused on the stigma these ex-offenders carry with them and considered how they developed a positive self-identity. Everyone he interviewed carried some anger about how they were treated by the system -- this counters the idea that they had served their time and should be able to become productive members of society.**

SUCCESSFUL TRANSITION

- **The study found the people who successfully make the transition to life after prison are those who address this anger and take a somewhat hopeless situation and use that as motivation to redeem themselves**

University of Cincinnati. "Life after prison: Ex-offenders' stigma management." ScienceDaily. ScienceDaily, 18 August 2014. <www.sciencedaily.com/releases/2014/08/140818135231.htm>.

