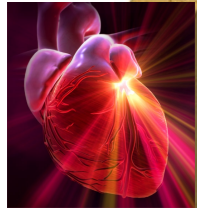


THE ANATOMY OF POSSIBILITY

Mindful Integration of Brain, Body and Heart Intelligences



Presented by
Tim Burns



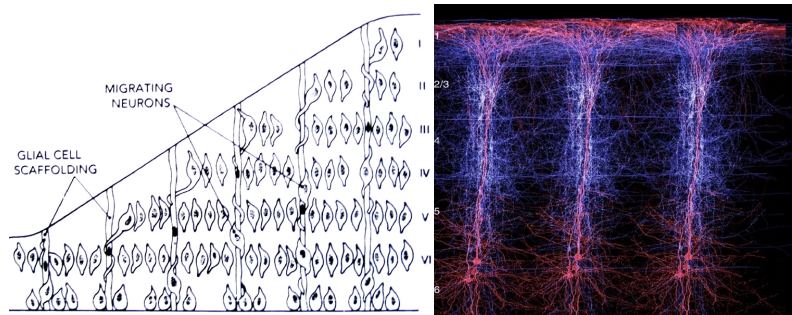
Santa Fe, New Mexico, USA
www.TimBurnsEducare.com

Mature Frontal Lobe Functions

- Envision the future
- Dream big dreams
- Set goals
- Make plans
- Detect problems
- Solve problems
- Manage emotions
- Control impulses
- Consider consequences
- Learn from mistakes



CEREBRAL CORTEX Six Cell-Layers



Diamond, Marion and Hopson, J.
Magic Trees of the Mind. New York: Dutton, 1998.

MOVEMENT and the BRAIN

Movement:
Active and Stimulating

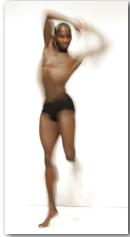


Exercise:
Movements you already know how to do

Benefits:

- Brings oxygen rich blood to the brain
- Elevates serotonin for balanced moods
- Improves mental clarity
- Reduces stress
- Improves cardio-vascular health
- Stimulates neurogenesis

MOVEMENT and the BRAIN



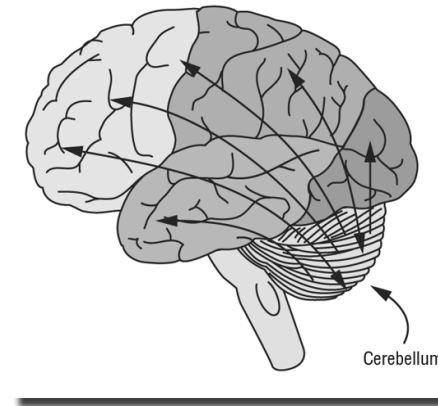
Movement:
Active and Stimulating

Stimulation:
Movements that are new to you

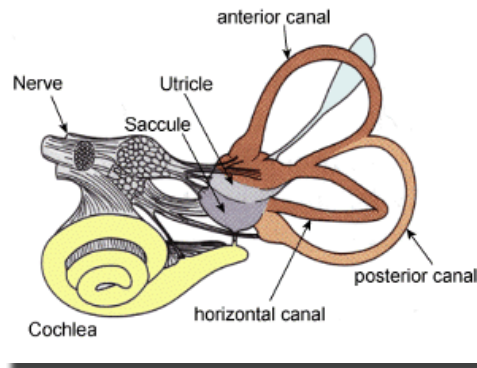
Benefits:

- Provides neural growth
- Builds neural capacity
- New movements are accompanied by novelty, challenge, and feedback
- Builds foundation for higher learning

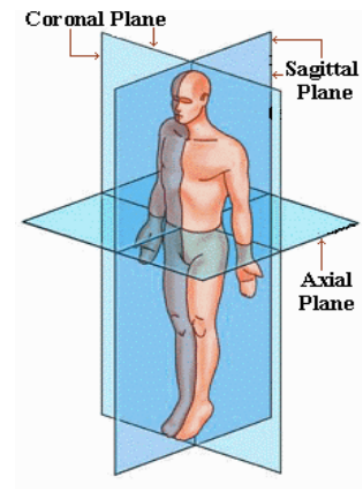
THE CEREBELLUM



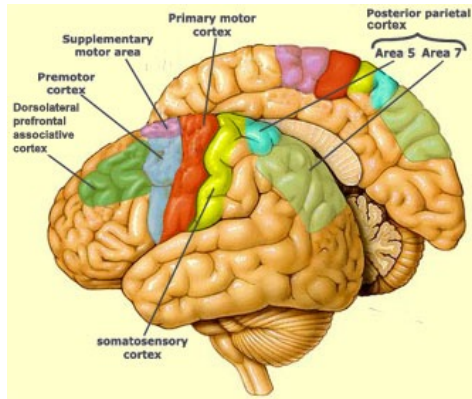
THE VESTIBULAR SYSTEM



THE MIDLINE PLANES



MOVEMENT and the BRAIN



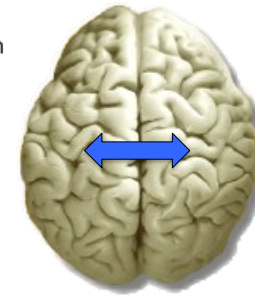
**Areas of the Brain
Involved in Movement**

MOVEMENT and the BRAIN

Communication Dimension

Left Brain

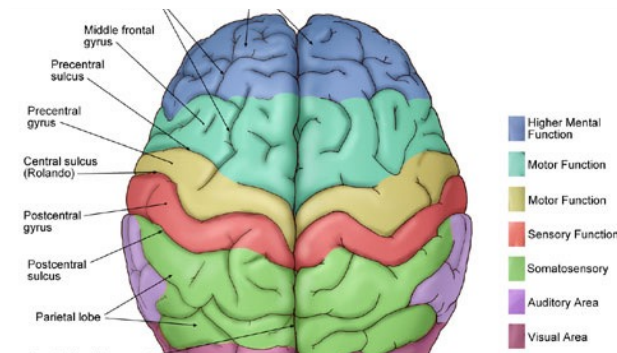
Logic
Verbal
Detail
Science
Names
Math
Strategy
Order
Thinking
Write



Right Brain

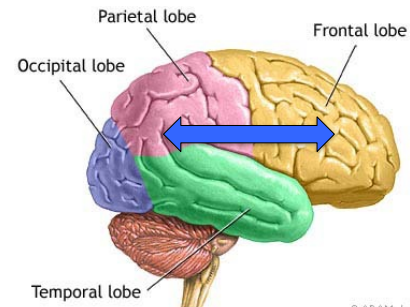
Pictures
Stories
"Big Picture"
Observation
Shapes
Music
Patterns
Imagination
Beauty
Possibilities

MOVEMENT and the BRAIN



THE MIDLINE PLANES

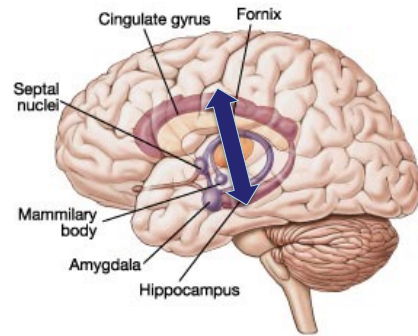
Concentration Dimension



© ADAM, Inc.

THE MIDLINE PLANES

Centering Dimension



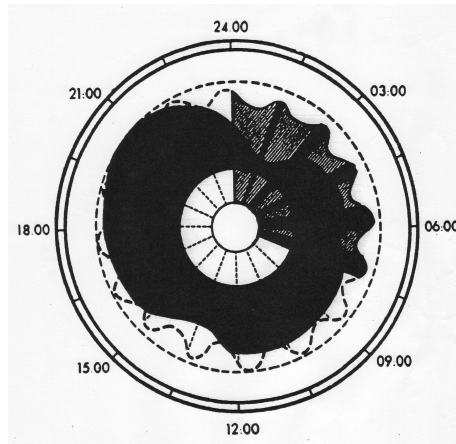
CHRONOBIOLOGY



Infradian
Circadian
Diurnal / Nocturnal
Ultradian

Hastings, Michael, "The Brain, Circadian Rhythms, and Clock Genes."
Clinical Review. BMJ 317:1704-1707, 19 Dec 1998.

BIORHYTHMIC VARIATIONS in the Circadian Cycle



Source: R. Broughton. "Biorhythmic Variations in Consciousness and Psychological Functions."
Canadian Psychological Review, 1975; 16: 217-239.

ULTRADIAN RHYTHMS MODULATED MIND-BODY ACTIVITIES

MIND

Right-left brain dominance
Attention
Concentration
Learning
Memory
Sensations
Perceptions
Emotions
Dreaming
Fantasy
Imagination
Creativity
Trans-personal sense

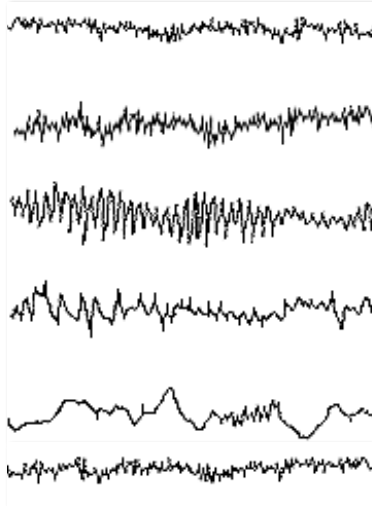
BODY

Left-right nasal dominance
Autonomic nervous system
Gene-cell metabolism
Endocrine system
Immune system
Breast-feeding
Hunger and sex
Digestion
Work and sports
Stress response
Psychosomatic response
Cellular metabolism
Drug sensitivity

Source: E. Rossi, *The 20 Minute Break: Using the New Science of Ultradian Rhythms*

BRAIN-MIND STATES

EEG Brainwave Activity



Gamma - 25-100 Hz (40hz typical).
Binds conscious perception

Beta – 13-30 Hz. Active, alert,
concentration

Alpha – 9-13 Hz. Relaxed focus, light
trance, enhanced serotonin
production

Theta – 4-8 Hz. Trance-like state;
enhanced catecholamine aids
retention of learning

Delta – 1-3 Hz. Dreamless sleep;
HGH produced

REM – Rapid Eye Movement;
dreaming

BENEFITS of PLAY

- **Greater self-regulation**
- **Problem solving abilities**
- **Emotional mastery and behavioral control**
- **Impulse regulation**
- **Reduction in drop-out rate, violence and crime**
- **Higher IQ scores**

Adele Diamond, Ph.D.
Developmental cognitive neuroscientist
University of British Columbia
Interviewed on NPR, Mar 4, 2006

ELEMENTS of PLAY

- Pleasure and enjoyment
- Goals not imposed from the outside.
- Motivation is spontaneous, voluntary, and intrinsic.
- Active engagement on the part of the player.
- Attention to the means over the end product of the action or activity.

“Children’s Play,” Paul McArdle
Child: Care, Health and Development, Vol 27, No 6, 2001

STAGES of PLAY

SOCIAL STAGES

- I. Solitary
- II. Parallel
- III. Associative
- IV. Cooperative
(also called peer play, socio-dramatic play)

COGNITIVE STAGES

- I. Object play
(also called practice, exploratory, manipulative play)
- II. Functional (use of an object for its intended use)
- III. Pretend/symbolic
- IV. Games with rules.

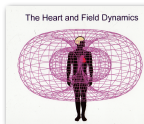
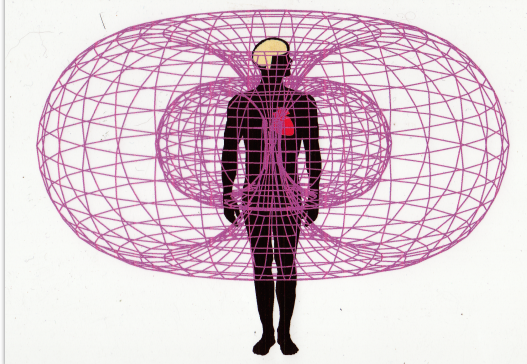
“Harnessing the Power of Play.” Sonia Mastrangelo.
Teaching Exceptional Children, Vol. 42, no 1, 2009



INTELLIGENCE of the HEART

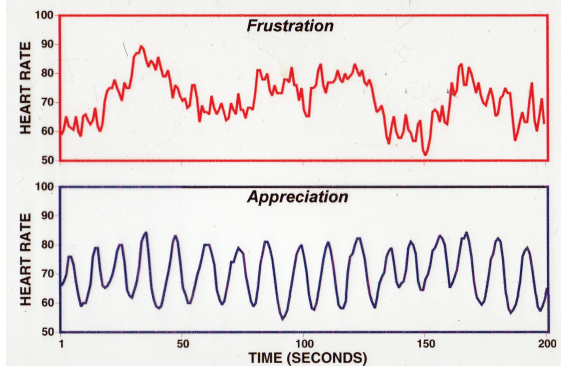
Biophysics

The Heart and Field Dynamics

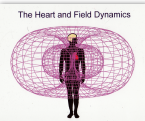


INTELLIGENCE of the HEART

Changing Heart Rhythms



McCraty, R., et al. "The Coherent Heart: Heart-Brain Interactions, Psychophysiological Coherence, and the Emergence of System-Wide Order." Boulder CA: Institute of Heart Math, 2003.



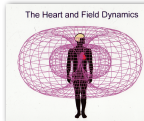
INTELLIGENCE of the HEART

INCOHERENCE

MORE STRESS

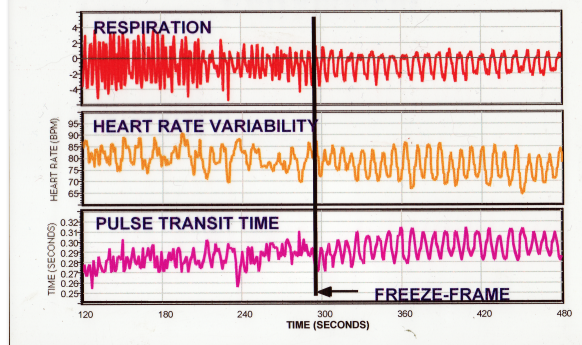


**GREATER CORTICAL INHIBITION
&
MORE HEALTH-RELATED PROBLEMS**



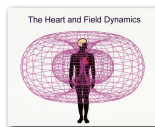
INTELLIGENCE of the HEART

Entrainment



Low brain in charge **High brain in charge**

McCraty, R., et al. "The Coherent Heart: Heart-Brain Interactions, Psychophysiological Coherence, and the Emergence of System-Wide Order." Boulder CA: Institute of Heart Math, 2003.



INTELLIGENCE of the HEART

THE FREEZE FRAME®

1. Recognize stress and freeze-frame it.
2. Shift away from the head to your heart.
3. Breathe through your heart.
4. Recall a positive time and try to re-experience it. Overlay the feeling on the earlier stress.
5. Ask your heart for a more efficient response to the situation.

Developmental Stages and the Brain

	Brain Stage	Intelligence Domain	Piaget Cognitive	Erickson Virtues	Maslow Needs	Kohlberg Moral	Steiner Spiritual
Mature Adult	Brain-Heart Integration	Heart: Wisdom and Compassion	Post-formal operations	Care/Wisdom: Generativity vs. Stagnation/ Integrity vs. despair	Self-actualization: morality, creativity, acceptance	Post-conventional: principled conscience universal ethic	Spiritual orientation
Teen - Adult	Neo-mammalian: Frontal cortex Teen to Adult	Thought: Abstraction & Meaning-making	Formal operations	Fidelity: Identity vs. Role confusion Love: Intimacy vs. Isolation	Esteem orientation: confidence, achievement, respect for & by others	Conventional: social-contract to Post-conventional	Soul orientation
6/7 - Puberty	Neo-mammalian: Posterior cortex Ages 6- 11/12	Thought: Concrete & Problem-solving	Concrete operations	Purpose: Initiative vs. Guilt Competence: Industry vs. Inferiority	Belonging orientation ----- Esteem orientation	Conventional: conformity authority social-order maintenance	Truth orientation
2 - 6/7	Paleo-mammalian: Limbic system Ages 2 - 6	Social-Emotional: Relationship	Pre-operational "The dreaming child"	Will: Autonomy vs. Shame & Doubt	Love and affection orientation	Pre-conventional: punishment & obedience	Beauty orientation
Birth - 2	Reptilian: Brain stem/ Cerebellum Birth - 2	Body: Self-preservation	Sensory-motor	Hope: Trust vs. Mistrust	Survival and Safety orientation	N.A.	Goodness orientation

E. Timothy Burns, 1990

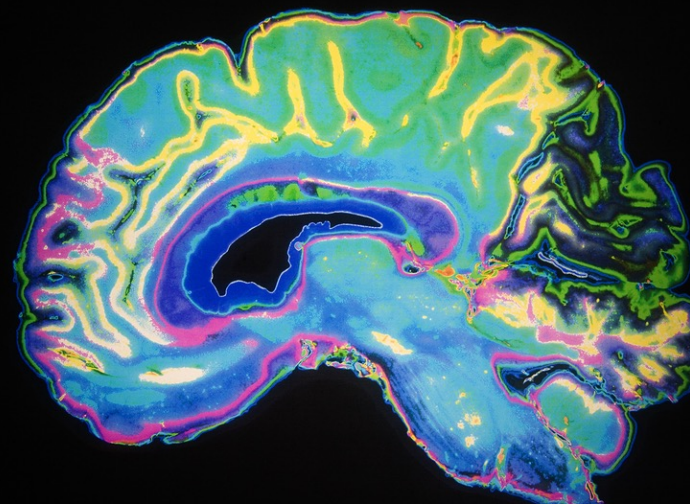
NATURE'S MANDATES For Human Learning and Development

PEDAGOGIC PRINCIPLES From a Developmental Perspective

EMERGENT PROPERTIES Of the Human Brain/Mind Intelligence Level

7. Cultivate and integrate wisdom and compassion	Introduce practices that awaken the heart, clarify the mind, and enliven the spirit	Transpersonal-Transrational The awakened heart: universal, boundless, metaphorical, noetic
6. Connect with a power beyond the self	Provide opportunities for connecting with a larger sense of purpose and place	Global-Systemic Insight, intuition, integration, meta-meaning and altruism
5. Achieve a sense of coherence, relevance, significance and meaning	Use authentic tasks that call forth problem solving, critical thinking, idealism and active construction of meaning	Abstract-Conceptual Logic and reason, analysis, hypothesizing, meta-cognition, possibility thinking, idealism
4. Discover and express creative talents, gifts and multiple intelligences	Ensure full use of the arts and science as central to the learning process, with ample opportunity for creative exploration and expression	Concrete-Creative Multi-sensory manipulation, experimentation, building, and creating
3. Develop the imagination and acquire emotional-relational fluency	Attend to emotional-relational development as the key to learning and successful living	Social-Emotional Relating, feeling, rule-making, role-taking and play
2. Overcome obstacles to development	Support sensory-integration through movement, play and imagination as the foundation for learning and development	Symbolic-Representational Mental images, pictures, words, language and stories
1. Bond with and attach to a consistent, nurturing care provider	Provide a caring and supportive environment that maximizes love and limits while minimizing harmful stressor	Sensory-Motor Sensation, perception, initial exploration and manipulation

Mindfulness and the Brain



The Mindful Brain

Mindfulness

*Paying attention in a particular way:
on purpose, in the present moment,
and non-judgmentally.*

Jon Kabat-Zinn, Ph.D.

Author and founder,
Mindfulness-Based Stress Reduction (MBSR) program
University of Massachusetts Medical School

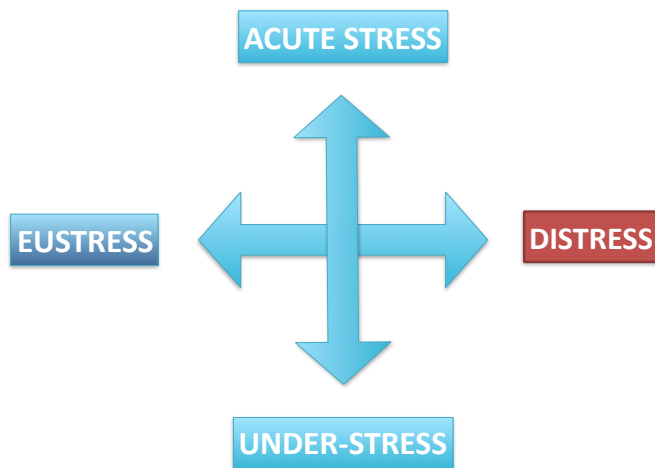
Mindfulness-Based Stress Reduction

30-years of MBSR research:

- Improved brain function
- Enhanced immune function
- Improved affect (reduced depression, anxiety)
- Reduction in pain levels
- Enhanced ability to cope with pain that may not go away
- Greater energy and enthusiasm for life
- An ability to cope more effectively with both short and long-term stressful situations.

<http://www.umassmed.edu/cfm/stress/index.aspx>

General Adaptation Syndrome



Selye, Hans, M.D., *The Stress of Life*, New York: McGraw-Hill

Autonomic Nervous System

Sympathetic Nervous System (SNS)



Increases:
Blood pressure
Fuel availability
Activity
Blood clotting
Adrenal hormones

Parasympathetic Nervous System (PNS)



Increases:
Digestion
Fuel shortage
Rest and recovery
Resistance to infection
Endorphins

GENERAL ADAPTATION SYNDROME

Autonomic Nervous System

Sympathetic Nervous System

"Fight or flight"

Expend energy

Outer focused

High brain-wave frequencies

Parasympathetic Nervous System

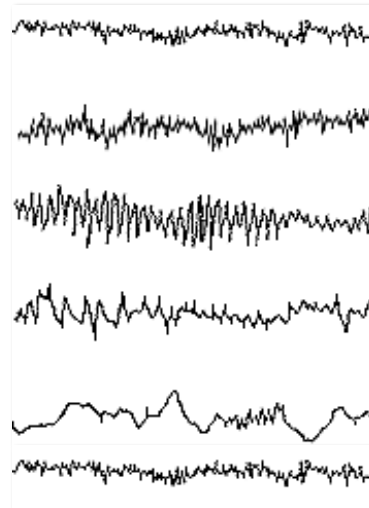
"Rest and digest"

Store energy

Inner focused

Low brain-wave frequencies

BRAIN-BODY-MIND STATES



Gamma - 25-100 Hz (40Hz typical).

Binds conscious perception

Beta - 13-30 Hz. Active, alert, concentration

Alpha - 9-13 Hz. Relaxed focus, light trance, enhanced serotonin production

Theta - 4-8 Hz. Trance-like state; enhanced catecholamine aids retention of learning

Delta - 1-3 Hz. Dreamless sleep; HGH produced

REM - Rapid Eye Movement; dreaming

GENERAL ADAPTATION SYNDROME

Autonomic Nervous System

Sympathetic NS

Normal

HOMEOSTASIS

Parasympathetic NS

GENERAL ADAPTATION SYNDROME

ALLOSTATIC LOAD

Sympathetic NS

New Normal



Parasympathetic NS

Proven Benefits of the Relaxation Response

- Increases awareness of whether you are tense or relaxed
 - Reduces the resting level of your autonomic nervous system
 - Improves concentration
- Increases hemispheric communication
- Transforms brain cells and establishes new neural pathways

Source: Benson, 1975, 1987, 2003.

Relaxation Response

1. Sit comfortably with your eyes closed.
2. Pay attention to your breathing, and repeat a word or phrase or prayer silently to yourself as you exhale.
3. When you notice your mind wandering (it will) just notice it and passively bring your attention back to your breathing.
4. Practice for approximately 20 minutes every day (or at least 3-4 times per week).

Source: Benson (1975, 1987, 2004)

Moving Beyond Risk to Resiliency: A Protective Factor Approach to Student Wellbeing and Academic Success

PROTECTIVE FACTORS

Protective factors in the lives of young people [are those] factors that, if present, diminish the likelihood of negative health and social outcomes.

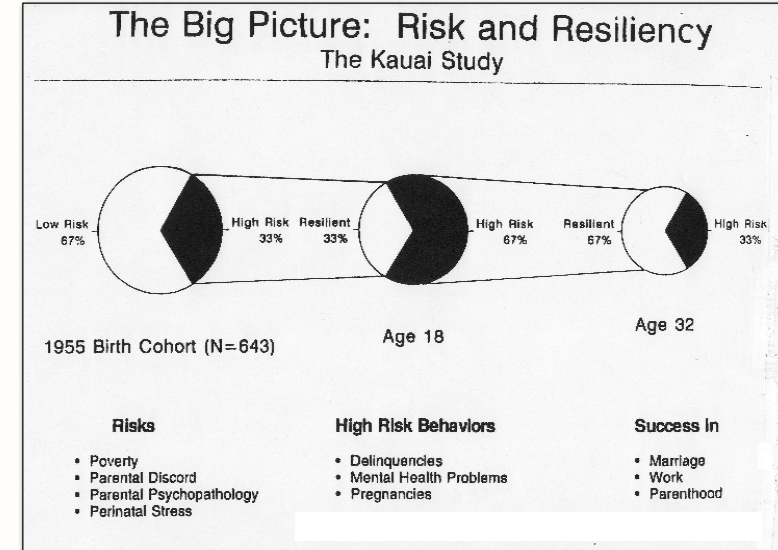
M. Resnick
Journal of the American Medical Association

Those traits, conditions, situations, and episodes that appear to alter -- or even reverse -- predictions of negative outcome and enable individuals to circumvent life stressors.

N. Garmezy
Pioneering resiliency researcher

COMMON FACTORS IN YOUTH RESILIENCY

Beardslee, W. and Podorefsky, D.
 "Resilient Adolescents Whose Parents Have Serious Affective
 and Other Psychiatric Disorders."
American J. of Psychiatry, 145 (1), 63-69.



Werner, E. & Smith, R.
Overcoming the odds: High risk children from birth to adulthood.
 Ithaca, NY: Cornell University Press.

THE SEVEN RESILIENCIES

- Insight
- Independence
- Relationships
- Initiative
- Creativity
- Humor
- Morality

Steve and Sybil Wolin: *The Resilient Self*

PROTECTIVE FACTORS WITHIN THE SCHOOL

CARING AND SUPPORT

- Relationship with Teachers
- Relationships with Friends/Peers
- Families and School Cooperation to Form a Protective Web
- Staff Sees Itself as Care-Providers

Source: Benard, *Fostering Resiliency in Kids*

THE SIGNIFICANT SIX

From the Risk-Reduction Research:

1. Pro-social Bonding
2. Clear and Consistent Boundaries
3. Life Skills

From the Resiliency-Building Research:

4. Caring and Support
5. High Expectations
6. Meaningful Participation

*Benard, B. "Fostering Resiliency in Kids: Protective Factors in the Family, School and Community."
Portland, OR: Western Regional Center for Drug-free Schools and Communities*

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Teen - Adult	<i>Neo-mammalian:</i> Frontal cortex Teen to Adult	<i>Thought:</i> Abstraction & Meaning-making	<i>Formal operations</i>	<i>Fidelity:</i> Identity vs. Role confusion <i>Love:</i> Intimacy vs. Isolation	<i>Esteem orientation:</i> confidence, achievement, respect for & by others	<i>Conventional:</i> social-contract to <i>Post-conventional</i>	<i>Soul orientation</i>
6/7 - Puberty	<i>Neo-mammalian:</i> Posterior cortex Ages 6- 11/12	<i>Thought:</i> Concrete & Problem-solving	<i>Concrete operations</i>	<i>Purpose:</i> Initiative vs. Guilt <i>Competence:</i> Industry vs. Inferiority	<i>Belonging orientation</i> ----- <i>Esteem orientation</i>	<i>Conventional:</i> conformity authority social-order maintenance	<i>Truth orientation</i>
2 - 6/7	<i>Paleo-mammalian:</i> Limbic system Ages 2 - 6	<i>Social-Emotional:</i> Relationship	<i>Pre-operational</i> "The dreaming child"	<i>Will:</i> Autonomy vs. Shame & Doubt	<i>Love and affection orientation</i>	<i>Pre-conventional:</i> punishment & obedience	<i>Beauty orientation</i>
Birth - 2	<i>Reptilian:</i> Brain stem/ Cerebellum Birth - 2	<i>Body:</i> Self-preservation	<i>Sensory-motor</i>	<i>Hope:</i> Trust vs. Mistrust	<i>Survival and Safety orientation</i>	<i>N.A.</i>	<i>Goodness orientation</i>