

Session Overview

- #1 - Brains Change**
(for the worse and for the better)
- #2 - Achievement Factors**
(learn which factors really matter)
- #3 - Getting on Board**
(it's time for real change)

Let's Simplify...

A – B – C

1. **Agree** on a clear, personal path
2. **“Buy-in”** from yourself on the idea
3. **Commit** to implementation

Poverty Quiz (true or false)

1. Most poor are lazy and lack ambition.
2. Poor people value education about the same as middle class.
3. If you gave the poor money, everything would change.
4. The parents have got to do more for the kids to learn better.
5. Schools *already* do their part; it's now up to the kids to do more.

6 Faces of Poverty

INTENSITY:

Absolute vs. Relative Poverty:

DURATION:

Generational vs. Situational Poverty:

CONTEXT:

Urban vs. Rural Poverty:

you deserve to know the truth:

Poverty is...

- 1) a _____ condition
- 2) it negatively affects the m____, body and s_____ in a synergistic way
- 3) the result of multiple, adv_____, risk f_____rs

Bottom Line

- Kids from poverty are different
- Brains adapt to suboptimal conditions
- But brains can and do change everyday
- You can facilitate positive change
- For others to change, you must change
- It will take new decisions, made daily
- The poor can and should graduate
- It will take a 100% “no excuses” mindset

INSIGHT:

What Do We Know About
the Scientific Evidence of
Poverty?

Brains
Can
Change
*for the
Better or
for the
Worse*

Premise

#1

**How are kids from low SES
different from others?
E-A-C-H Kid Deserves Better**

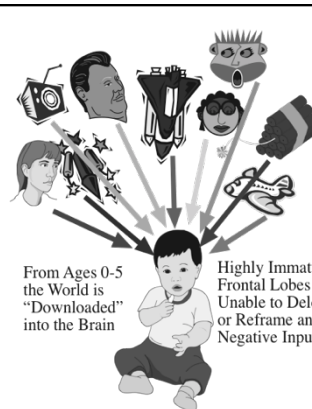
Emotional Support
Acute/Chronic Stress
Cognitive Stimulation
Health & Safety Issues

3 Emotional Keys

Attunement – to build the
“emotional response keyboard”

Attachment – safe, trustworthy
relationships builds faith in others

Emotional Punctuation – to help
the brain identify what’s correct (or
not) and decide if it’s worth saving



Kids “download”
the negatives of
chaos, disharmony,
poor relationships,
foul language,
poor manners, and
weak vocabulary
just as quickly
and just as
automatically
as they would
any positive or
enrichment input.

Are Emotions in Our DNA, Hard-Wired and Present at Birth?

Researchers use different terms and criteria to label *universal facial expressions, action readiness states, bodily engagement or neural firing.*



Anger, disgust, fear, joy, sadness, and surprise

Arnold, Ekman, Friesen, Ellsworth, Gray, Izard, James, McDougall, Mowrer, Oatley, Johnson-Laird, Panksepp, Plutchik, Tomkins, Watson, Weiner & Graham

Kids from poverty get less “attunement” time

Attunement is the establishment of a positive, reciprocal, relationship with the primary caregiver.



This “quality time” provides the basis for learning the non-hardwired socially appropriate emotions.

Infants Learn Early Emotions

Between ages 3 and 6 months, infants in healthy families get daily exposure to over 300 displays of exaggerated emotion.



Infants ideally need 20-30 per hour for 12 hours a day. This is the foundation for socially appropriate school behaviors. Watching DVDs or TV won't substitute.

Malatesta, CZ, Izard, CE (1984)

If the Healthy Emotional Brain Was Represented by a Keyboard, Many Students Today Use Fewer “Keys”



TAUGHT:

- Humility
- Forgiveness
- Empathy
- Optimism
- Compassion

HARD-WIRED

- ✓Sadness
- ✓Joy
- ✓Disgust
- ✓Anger
- ✓Surprise
- ✓Fear

TAUGHT:

- Sympathy
- Patience
- Shame
- Cooperation
- Gratitude

Discipline Problems Emerge When Teachers Expect *What They Cannot Get*



"Hey, show a little remorse about it!"

Many kids don't have the full emotional range to respond well **UNLESS** they are taught **HOW** to respond in class.

3 Emotional Keys

Attunement – to build the “emotional response keyboard”

Attachment – safe, trustworthy relationships builds faith in others

Emotional Punctuation – to help the brain identify what's correct, positive and worth saving

Why Positive Emotions Matter

Of all the things researchers have discovered about the value of quality relationships, one of the most surprising is that they are strong mediators of stress. *Good relationships diffuse stress and make your life easier.*



Securely Attached? Not Usually

Children of Poverty are More Likely to...

- Hear less responsive, fewer supportive, less interactive home conversations.
- Get less quality time and less *total* time from their parents or caregivers--that's stressful.

(Hart and Risley 1995.)

(Fields and Casper 2001.)

Trust and Attachment Issues for Low SES Children

Children of poverty were *50% more* likely to experience physical neglect and *80% more* likely to report sexual abuse than those of middle to upper SES-- very stressful to them!

(Hussey, Chang, & Kotch, 2006)



Emotional Support

A mother in poverty is less likely to provide the emotional support needed for proper developmental growth when she's *stressed* about her own health, safety, bill-paying, hunger and housing prospects.



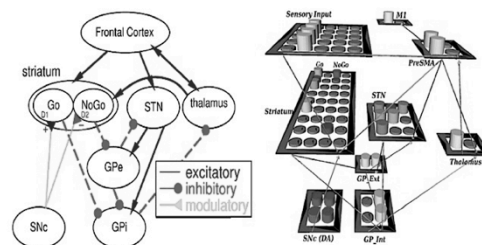
3 Emotional Keys

Attunement – to build the “emotional response keyboard”

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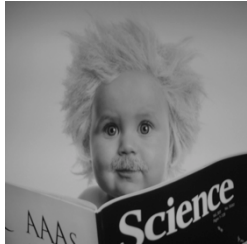
Emotional Punctuation – to help the brain identify what’s correct, positive and worth saving

Accurate Cognition Requires “Emotional Signposts”



Emotional Punctuation in Language

- Study used two half hour sessions with 30 infants and their mothers.
- Half the mothers were asked to smile, move closer and touch their infants ONLY AFTER the infants vocalized. The control group of mothers did the same actions, but randomly.



Goldstein, M. H., Fogel, P., & West, M. J. (2003, June 24)

The study reported that the group of infants who had emotional punctuation learned *much faster*.

Emotional Punctuation is “Memory Marker”

- Event + positive emotions = better memories
- Home and classroom might include these:



verbal affirmations, smiles, physical gestures, head nodding, positive comments, positive music, celebrations, use of name or pre-set celebration rituals

Using Emotional “Markers” Reduces Re-teaching Time



Your student’s brain will either “mark” the newly acquired information as “worth saving” or “let it go” and fail to encode it. “Markers” include smiles, gestures, comments, music, affirmations and use of names. *Teachers are the determining factor of how much re-teaching is needed, not the kids.*

Is Negative Emotional Punctuation Possible?

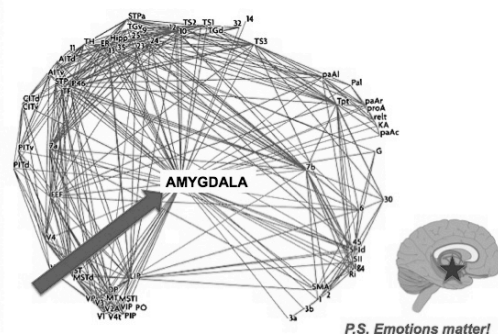
Teachers who criticize, demand and use sarcasm as classroom discipline will activate the fear and stress areas of the student’s brain.



This activation alters the student’s ability to think and learn.

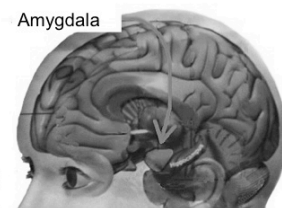
How Much Input Does the Amygdala Have to the Rest of the Brain?

Young, J.P., Somerville, J.N. (2008) Analysis of connectivity: neural systems in the amygdala cortex. *PLoS Neurosci*, 5: 2271

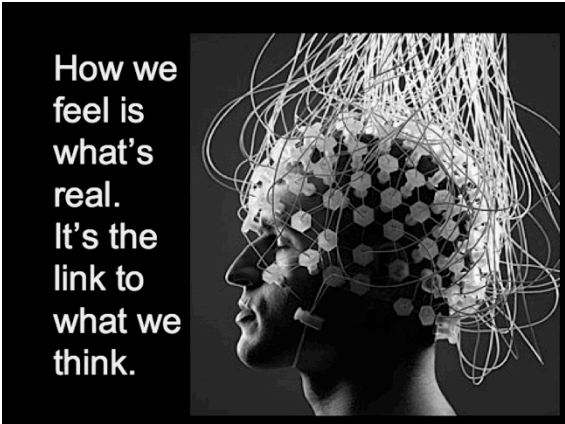


Fight, Flight or Freeze?

Once the amygdala is activated in class, it takes *at least 30 – 90 minutes* to calm down for quality learning.



Threats, insults, put-downs and sarcasm activate the amygdala



“Great theory! But what do we do?”

Those in poverty typically have “dysregulated” emotional systems. Staff must teach a healthy range of emotional responses, build and strengthen affiliations, relationships and use emotional punctuation.

- Discussion Time**
1. What was reinforcing to you? (content that you already knew)
 2. What was fresh, novel and new to you?
 3. Given what you now know, what does this suggest you might do differently in your work?

E-A-C-H Kid Deserves Better


Emotional Support
Acute/Chronic Stress
Cognitive Stimulation
Health & Safety Issues

- Chronic Stress Effects... T or F?**
1. Creates emotional problems (T or F)
(Burgess et al. 1995)
 2. Lowers IQ, reading scores (T or F)
(Delaney-Black, et al. 2002)
 3. Drastic memory loss (T or F)
(Lupien, et al. 2001)
 4. Shortens dendrites (T or F)
(Cook and Wellman, 2004), (Brown, et al. 2005)
 5. Causes neuron death (T or F)
(De Bellis, et al. 2001)
 6. Fosters inappropriate attachments (T or F)
(Schoore, A. 2002)

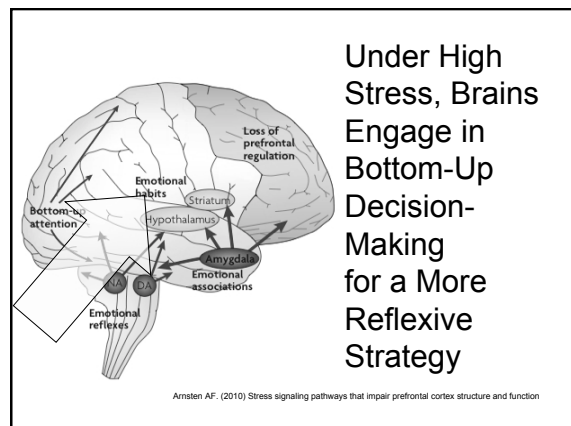
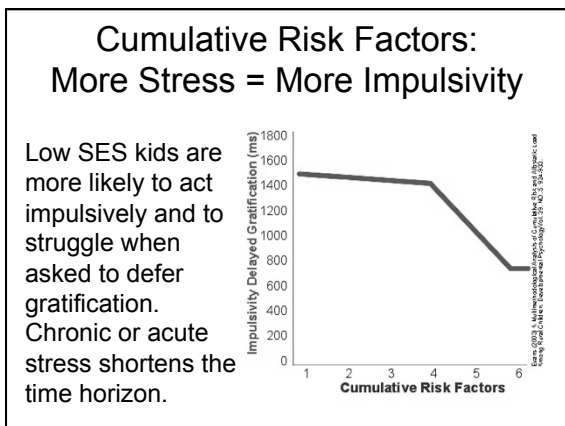
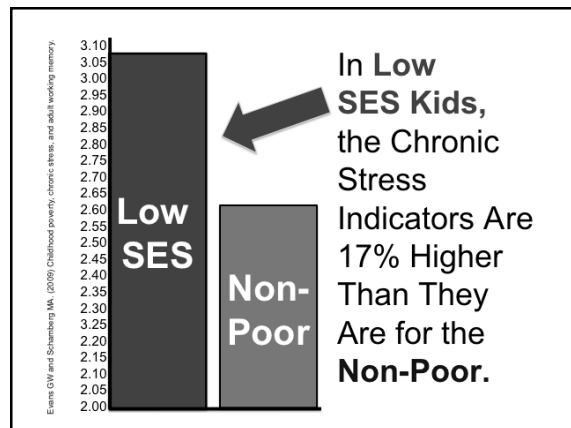
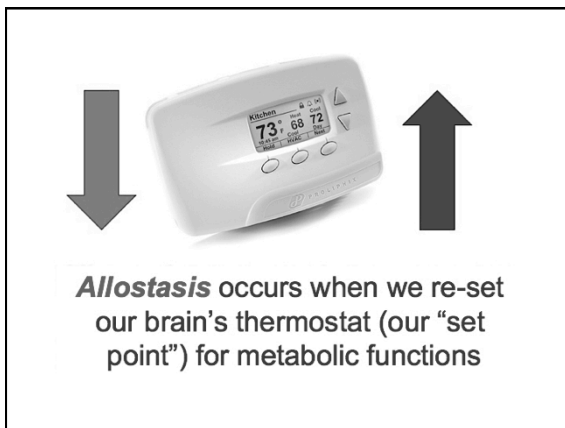
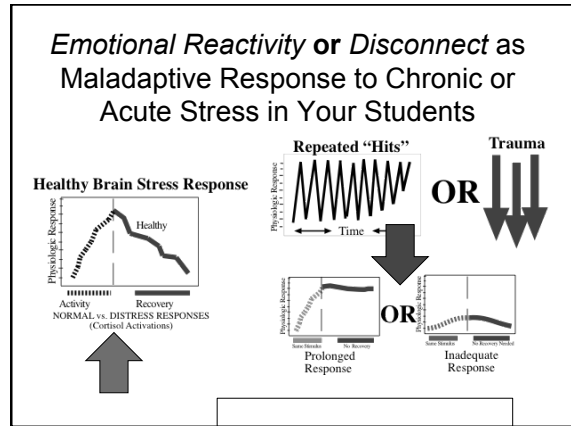
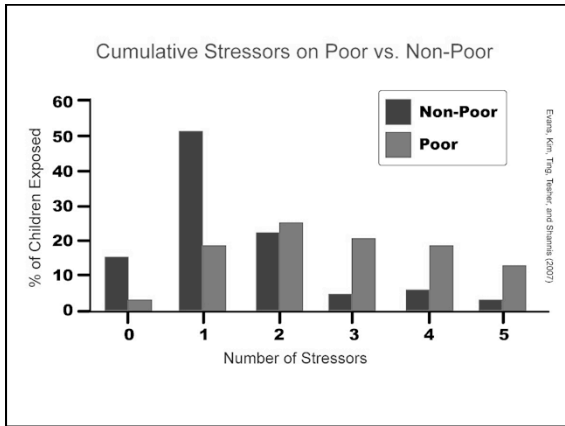
✓ **Stress and Distress** (chronic) is healthy for us!

✓ **Distress** (chronic) is toxic to our brain and body!

✓ Low SES children are exposed to: 1) more stressors, 2) more intense and longer lasting stressors, and 3) have fewer coping skills than their higher SES counterparts.




Evans, G.W., Kim P. (2007) Childhood poverty and health: cumulative risk exposure and stress dysregulation.



Effects of Allostatic Load

- Distress is linked to >50% of ALL absences and causative in 17% .
(Johnston-Brooks, et al.1998)
- Distress affects attention, focus and concentration.
(Erickson et al. 2003)
- Increased allostatic load impairs cognition, creativity and memory.
(Lupien et al. 2001)
- Social judgment skills are diminished. (Wommack et al. 2004)
- Early life distress may create lifelong health problems. (McEwen 2003)
- Distress reduces neurogenesis, memory and accelerates aging.
(DiBellis et al. 2001)

Instability = Stressors



Children in poor families:

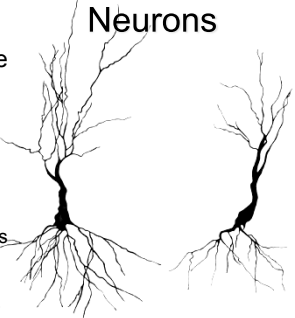
- move twice as often
- get evicted 5X as much (Federmen et ag.1996)

- Experience more chronic stress and up to 35% more daily hassles
(Attar et al. 1994)
- Live in crowded homes (3X more likely)
(US Census Bureau. 2000)

Distress Affects Neurons

Dendrites taken from rat PFC show effects of distress.

How much exposure to distress (in time) would you predict it would take for neurons to wither as shown?

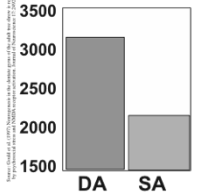


a) 2 hrs./day for 2 months
b) 30 min./day for 7 wks
c) 1 hr./day for 10 weeks
d) 10 min./day for 5 days
(Brown et al. 2005)

Control Stressed

Effects of Environmental Distress on the Birth of New Brain Cells

Greater Stress = Fewer Neurons



Yikes!

DA = Dominant Animals
SA = Subordinate Ones
BARS = # New neurons

For those in poverty, nearly everything takes more time


- Transportation
- Food gathering and prep
- Getting medical help
- Information gathering
- Locating & securing school help



This creates a "poverty of time" that impacts children -- more stress!

School Behaviors

Kids from Poverty are often:
Distractible & hypervigilant
Or...
may have Learned helplessness



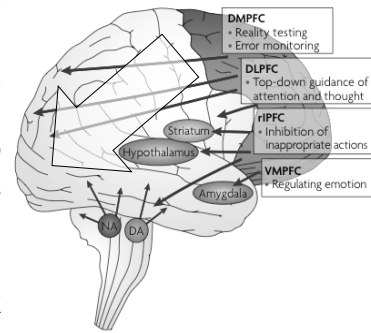
Yet, these are symptoms of stress disorders, not apathy or a negative anti-school "attitude"

Can You Change Your Own Altered Allostatic Load?



Yes. It takes time, focus and intention. Otherwise the brain will continually re-set itself to the last “setting.”

Under Low Stress, Brains Engage in *Top-Down* Decision-Making, Inhibition, and Risk Analysis



Amsten AF. (2010) Stress signaling pathways that impair prefrontal cortex structure and function

Leisure De-Stressing

Lower SES families are less likely to have opportunities to de-stress such as:

- 1) longer vacations, fun experiences
- 2) restaurant meals, catering, splurges
- 3) massage, spa therapy, Jacuzzi®



“Great theory! But what do we do?”

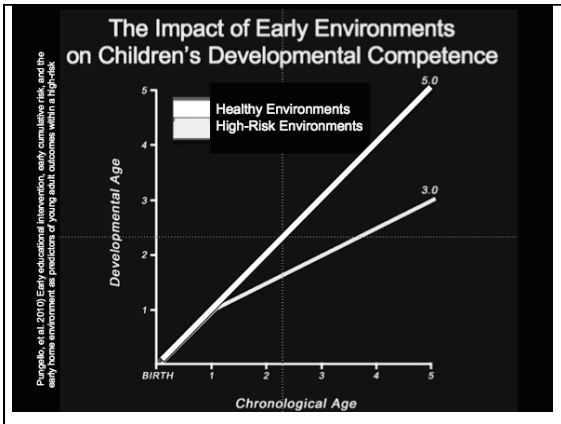
Those in poverty typically have “dysregulated” stress response systems. You must: 1) give kids appropriately increasing amounts of control over their lives at school and 2) teach coping skills.

Discussion Time

1. What was reinforcing to you? (content that you already knew)
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3. Given what you now know, what does this suggest you might do differently in your work?

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Environments Power the Brain Growth

ABCD E
FGHIJK
LMNOP
QRSTU
VWXYZ

- ✓ The **physical environment** needs to be safe, varied and complex.
- ✓ The **language** must be interactive, complex and continuous.
- ✓ The **cognitive environment** needs variety, richness and increasing complex physical movement.

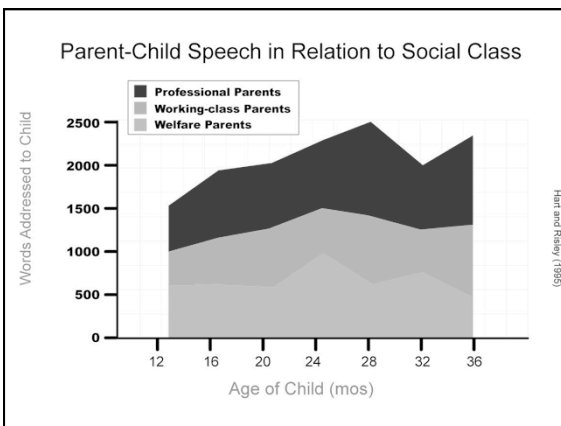
Cognitive Stimulation and Poverty

1. Kids need more than exploratory opportunities
2. They need novel, environments with variety of human (not-electronic) activities
3. Television is unfriendly to the developing brain

The difference in the amount of parental verbalizations of children in families on welfare *versus* professional families is:

- a) double
- b) triple
- c) four fold

Hart and Risley (1995)

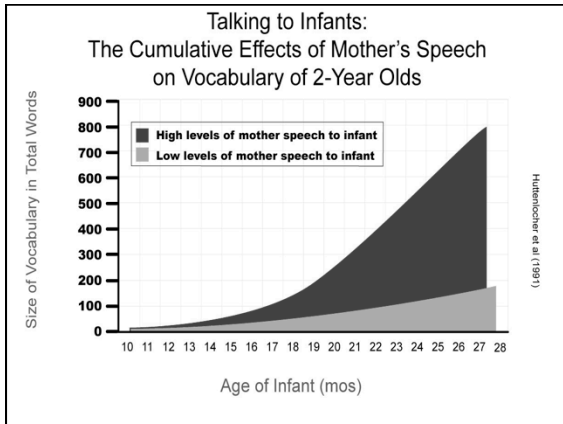


Ideal Home Support for Reading Includes:

- 1) material available, 2) being read to often, and 3) accurate evaluation.


Low-SES homes get less of all 3 above. Mothers were also less accurate in evaluating and mediating their children's emergent reading levels compared with higher SES moms.

Korat, & Haglilii (2007)



Language Influences Cognition

Toddlers from middle and upper income families actually used more words *in talking to their parents than low SES mothers used in talking to their own children.*




(Bracey, 2006)

Poor are less likely to have these learning resources:

1. computers to access the internet or chat rooms for homework help
2. a den or library with 100's of books around the house
3. a library card, a membership in the local Boy's or Girl's Club
4. an older sibling who is doing well enough in school to tutor him/her

Which parents are more likely to:

- 1) know their child's teachers by name,
- 2) accurately identify their child's best and worst subject, and
- 3) know how well their child is performing in classes




- a) Poor
- b) Middle class
- c) Wealthy

(Baker & Stevenson, 1986)

Poor families cannot afford these options:

- ✓ quality child care
- ✓ stimulating toys
- ✓ recreational books
- ✓ team uniform costs
- ✓ school supplies
- ✓ team travel costs
- ✓ scouts or summer camp
- ✓ private music/dance lessons


"Extras" for Learning

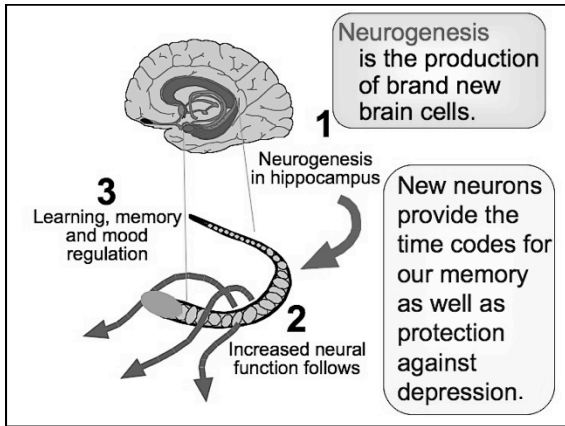


(Posner & Vandell, 1999; Sherman, 1994.)

For Over 100 Years, Scientists Accepted as "Fact" that Our Brain **Never** Grew New Cells

After All, If It Was True, It Would Mean That We Could Grow and "Rewire" Ourselves During Our Own Lifetime!





Neurogenesis (the production of brand new brain cells) is:

Is Reduced By:

- **Distress**
- **Inactivity**
- **Boredom**
- **Depression**
- **Poor Nutrition**
- **Isolation and Low Social Status**

Common Factors in the Lives of Low SES Kids!

P.S. Teachers can influence many of these factors

P.P.S. Neurogenesis is the raw material for explicit learning!

Does Growing Up Poor Adversely Affect Brain Cell Production? Yes!

The brain produces new neurons every day. These cells have been found to be highly correlated with:

- 1) learning
- 2) memory
- 3) obesity
- 4) mood regulation

But, change is possible!

Memory and Cognitive Conflict: SES Differences

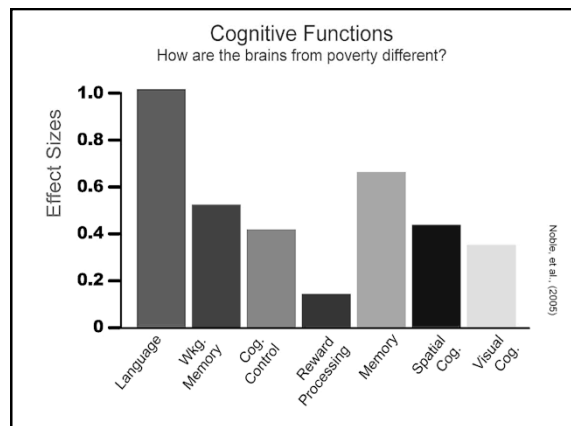
Poor kids are less able to handle dissonance; the cognitive conflict skills which are learned because they often get little or no role models to see and hear them being used.

Noble KG, Norman MF, Farah MJ (2005) Neurocognitive correlates of socioeconomic status in kindergarten children. Dev Sci Jan;8(1):74-87

Brains of Lower SES are Different than those from Higher SES

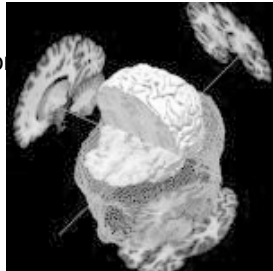
Areas include those responsible for working memory, impulse regulation, visuospatial, language and cognitive conflict

Noble KG, Norman MF, Farah MJ (2005) Neurocognitive correlates of socioeconomic status in kindergarten children. Dev Sci Jan;8(1):74-87



The 5 Most Likely Brain Disorders for Low SES Kids

1. Stress (GAD, LH, PTSD or Depression)
2. AD/HD (and ADD)
3. Learning delays
4. Attachment
5. Dyslexia



“Great theory! But what do we do?”

Those in poverty typically have under-developed and under-performing brains. To be effective, school must provide enriched skill building targeting executive functions.

Discussion Time

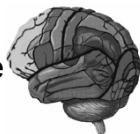
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E-A-C-H Kid Deserves Better

Emotional Support
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Health & Safety Issues

Children born to low-income families are more likely to:

- be premature
- be low in birth weight
- have other disabilities such as asphyxia and fetal alcohol syndrome
- receive poor prenatal care (Bradley and Corwyn, 2002), (Bradley 2002).



Health
 Issues
 Affecting
 the
 Developing
 Brain

More Toxic Exposure

• Lead

Unsafe lead levels are 4X higher in children from low vs. high income families

(Brody et al. 1993)

• Poison

Have more exposure to cigarette smoke

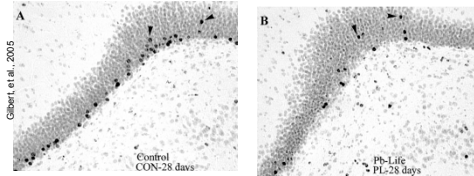
(Childstats 1999)

• Hazards

Greater exposure to environmental hazards (cleaners, tobacco, paint, drugs, smog, etc.)

(Suk, et al. 2003)

Effects of Lead on Neurogenesis



Control (on L) Exposed (on R)
After 4 weeks of Pb exposure, note significant differences in new cell production

Exposure to Toxins

Dangerous Address

- Live on or near toxic waste sites

(Brody et al. 1993)

Air Quality

- Live in areas that did not meet National Ambient Air Quality Standards (EPA 2000)

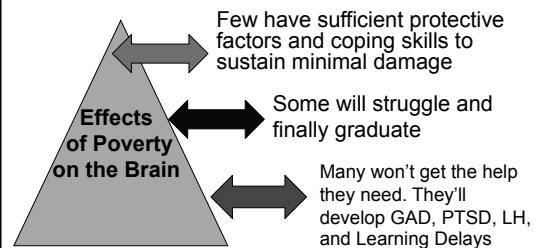
Pesticide Exposure

- Have more exposure to pesticides (negative synergistic affects when combined with stress) (Moses et al. 1993) and (Relyea, 2004)

“Great theory! But what do we do?”

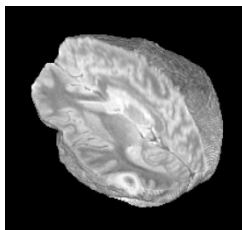
Those in poverty often have exposure to unsafe and unhealthy living conditions. School absolutely must be a safe and healthy place. Enrichment can mitigate the toxic effects on the brain.

How Poverty Changes the Brain



Brains of Poverty Will Be Different!

The good news is... Brains are also designed to adapt to positive experiences



you deserve to know the truth:

Poverty is...

- 1) a _____ condition
- 2) it negatively affects the m____, body and s____ in a synergistic way
- 3) the result of multiple, adv____, risk f____rs

E-A-C-H Difference

Em_____ **Support**
Acute/Ch_____ **S**_____
Co_____ **Stimulation**
H_____ & **S**_____ **Access**

Are You Discouraged?
 Does it Seem Impossible to Succeed?
 Struggling to Make Progress?
 (stay tuned)



Brains Can Change *for the Better!*

POINT

#1

OLD: 50% Genes & 50% Environment



What Determines Our Destiny?




Old Paradigm:
 Brains Stay the Same;
 Kids Stay the Same



New Understanding:
 Brains can and do change everyday. But if the experiences stay the same, so will the brain! We must change things. I'll show you how!

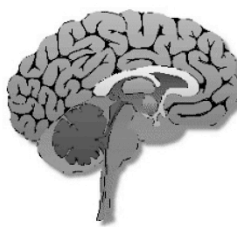
Can Educators Trigger Gene Expression? **Yes!**

- ✓ Stress/Distress
- ✓ New Learning
- ✓ Emotional States
- ✓ Physical Activity
- ✓ Social Conditions
- ✓ Nutrition
- ✓ Beliefs/Thoughts



Rossi, E. (2002) The Psychobiology of Gene Expression

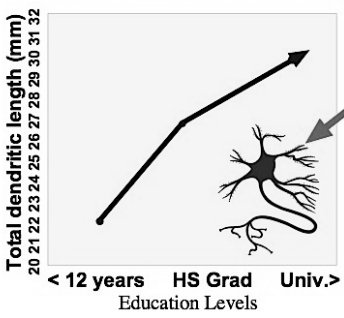
What Actually Changes in Our Brains?



- neurogenesis
- cell size
- cell connectivity
- new cell survival
- gene expression
- neural plasticity
- chemical levels
- activity distribution
- blood flow
- glucose metabolism
- neural growth factors


Peter Huttenlocher, (2002) Neural Plasticity

Greater Educational Levels Increases Dendritic Growth

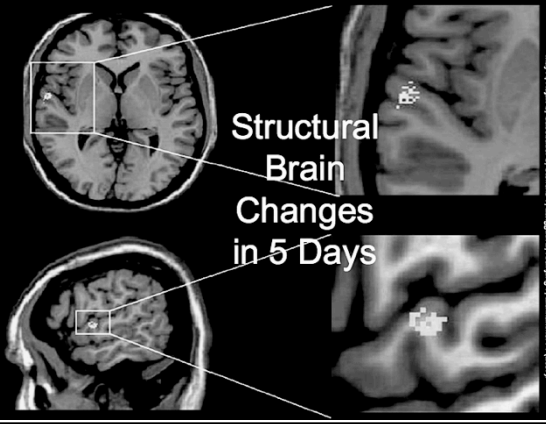


Total dendritic length (mm)
20 21 22 23 24 25 26 27 28 29 30 31 32

< 12 years HS Grad Univ.>
Education Levels

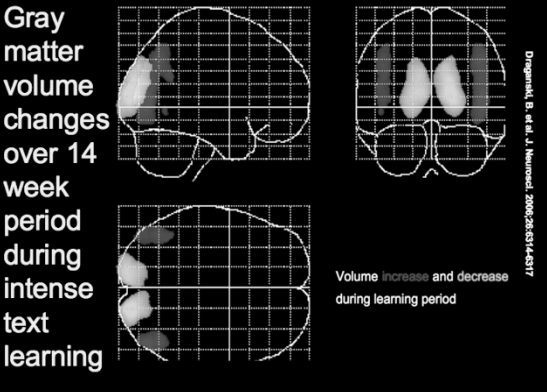


Structural Brain Changes in 5 Days



Lara A. Heifetz, G. Gundersen, B. Storz, T. Langenhove, J. Ehrhardt, P. (2007)

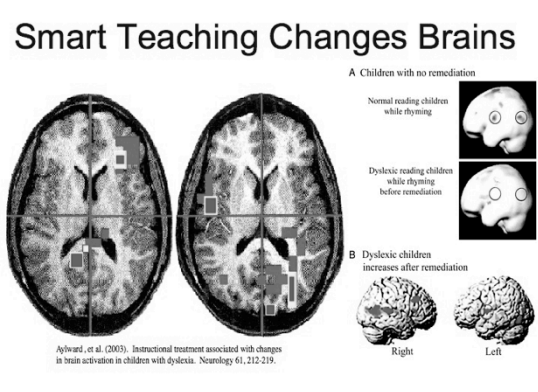
Gray matter volume changes over 14 week period during intense text learning



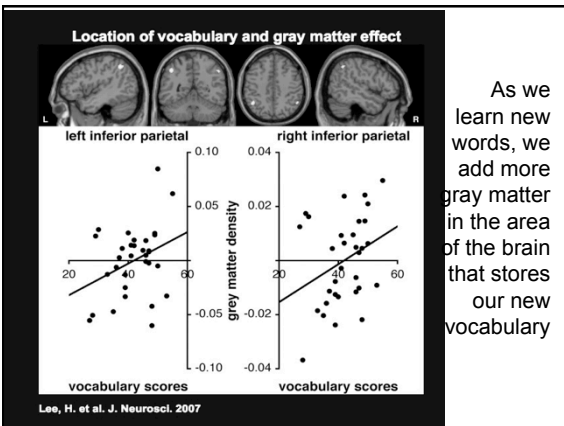
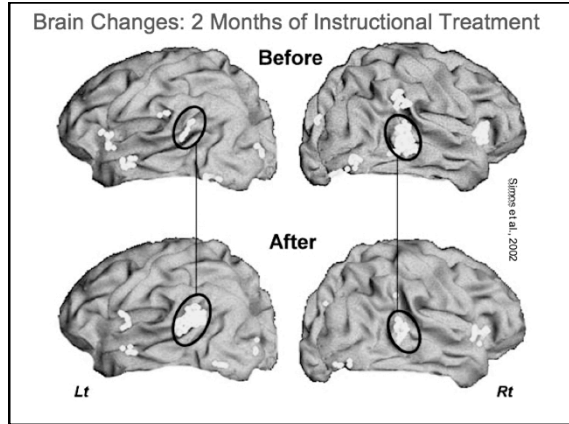
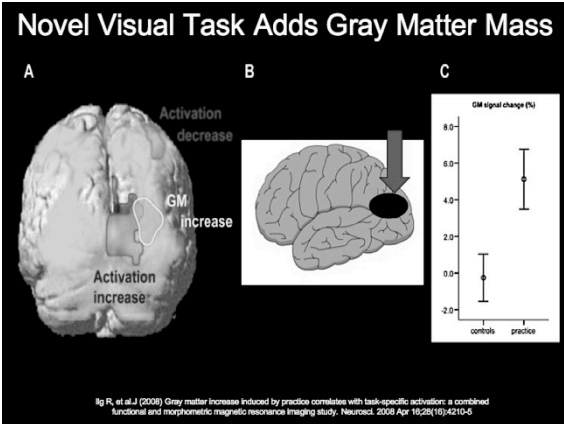
Dingemans, B., et al., J. Neurosci., 2006;26(35):9448-9457

Volume increase and decrease during learning period

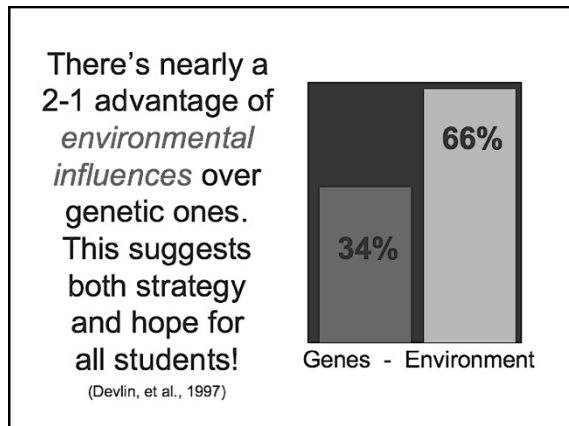
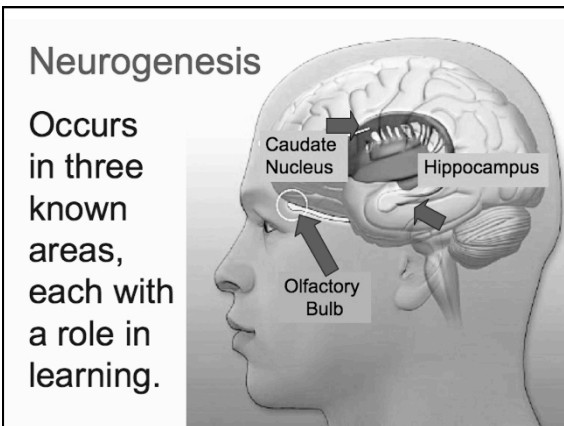
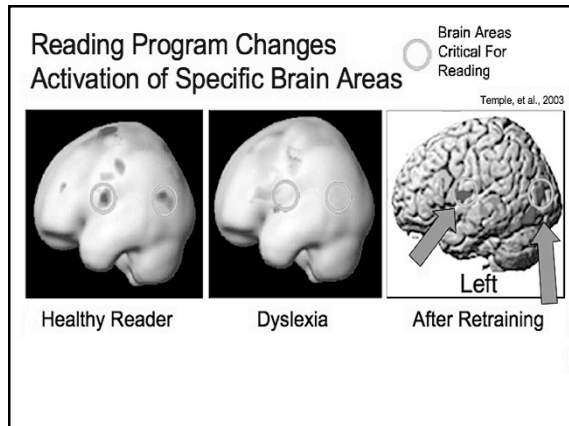
Smart Teaching Changes Brains



Aylward, et al. (2003). Instructional treatment associated with changes in brain activation in children with dyslexia. Neurology 61, 212-219.



As we learn new words, we add more gray matter in the area of the brain that stores our new vocabulary



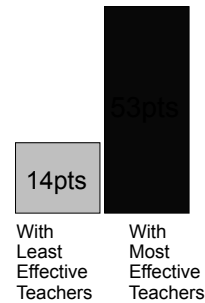
The “Academic Brain”



- ✓ Kids are not born an “A” student
- ✓ Specific skills must be developed
- ✓ Catastrophes need to be avoided
- ✓ Certain experiences need to happen
- ✓ The brain that does well in school has “sculpted by life” over time

Student Achievement with Low vs. Highly Effective Teachers

Low-achieving students gain an average of 14 percentile points with the least effective teachers. By contrast, the most effective teachers produce average gains of 53 percentile points with low-achieving students



Source: Daniel L. Goldberg, “Teacher Quality Matters: The Impact of Teacher Effectiveness on Student Achievement,” University of North Carolina (2008 and revised 2009)

Can an Enriching Change in Everyday Environment Raise IQ in Low SES Students?

+19.5 IQ in Best cases

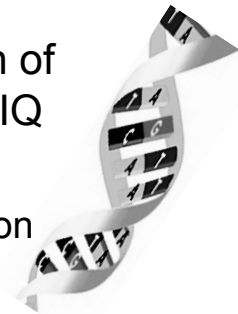
+13.9 overall

Baseline (<86 IQ)

65 low SES children were adopted between 4 and 6 years of age, all with an IQ <86 before adoption. After eight years, the average overall IQ gain was 13.9 points, and the gain was as high as 19.5 points in some children. Duyme et al. (1999).

Q: How Much of Our Parent’s IQ is Heritable?

A: It Depends on Your SES!



Turkheimer, et al., (2003, 2010)

BOTTOM LINE: The lower the student’s SES, the less heritable their parent’s IQ is and the greater the effect is from the environment.

How Much Do Genes Matter in Children From Poverty?

Tucker-Drob EM, Riemtulla M, Harden KP, Turkheimer E, Fask D. (2011)



Using results from a sample of 750 pairs of twins, researchers said, “At age 2 years, genes accounted for nearly 50% of the variation in mental ability of children raised in high-SES homes, *but genes account for negligible variation in the mental ability of children raised in low-SES homes.*”

DNA is NOT Your Destiny!

Sometimes the apple DOES fall far from the tree!



Secrets of The Human Brain

Kids from poverty bring challenges, but also *opportunities*.



The worse off the student, *the greater the capacity for change*. Brains are built to change. Remember, it's *much easier* to bring a kid from 80 IQ to 100 than from 100 going upward.

Can Brains Change for the Better?

1) If so, are there schools that reflect this potential?

2) What would it mean to me to know they exist?

Another Elementary Success

- K-5 school on the north side of San Antonio
- 100% free and reduced breakfast and lunch
- 95-98% children of color
- Went from bottom 25% in state to top 25% in state tests
- National Blue-Ribbon School



Another Secondary Success

- Middle & high school with 100% poverty has 94% students of color
- One of America's Top 100 schools
- School has daily attendance rates of 95-98%
- Graduation rates are over 98%



Discussion Time

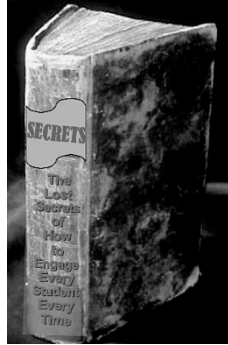
1. What would you say to other staff who say, "You cannot do anything with these students. They are often tardy, disrespectful, angry or unmotivated."

Let's brainstorm!

Strategies

The Research Says

- School climate matters
- Building positive attitudes is critical
- Engagement is a must
- Relationships matter
- Teaching “how to” skills is essential
- Staff that collaborate to do these things, over time, will succeed



Session Overview

#1 - Brains Change

(for the worse and for the better)

#2 - Achievement Factors

(learn which factors really matter)

#3 - Getting on Board

(it's time for real change)

Which achievement factors matter the most among the poor?

POINT

#2

S-H-A-R-E

Themes for Success

- S - Skill-Building
- H - Hope & Growth Mindset
- A - Accommodations
- R - Relationships
- E - Enriched Engagement

Which Factor, (When Tested at Age 5) is a *Far Greater Predictor* of Student Success at Age 11 than IQ?



Alloway, T.P. & Alloway, R. G. (2010)

- a) reading scores
- b) motivation level
- c) math scores
- d) attitude
- e) working memory

What Skills Matter Most for the Student's Academic Success?

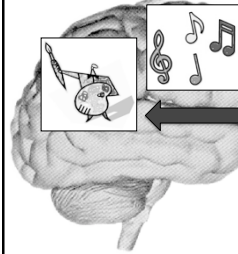
- ✓ Processing
- ✓ Attentional focus
- ✓ Self-control
- ✓ Working memory
- ✓ Prioritization
- ✓ Ordering/sequencing
- ✓ Deferred gratification

Today We Focus on 2 (of 7) Key Skills to Build Academic Success

- ✓ Memory (working)
- ✓ Attentional focus



What is in Our Working Memory?



The contents are always either
 1) sounds, called a “phonological loop”
OR
 2) a picture, or visual-spatial “sketchpad”
AND
 either MAY be moved later to long-term memory
AND

it can be strengthened by practice and strategy.

Skill Building Insight

- ✓ Every subject is the perfect vehicle for strengthening academic skills.
- ✓ *When we over-focus on mastering content, we don’t make time for skill development and it loses out.*
- ✓ Every staff needs to collaborate to discover not IF, but *HOW, WHERE and WHEN*, they’ll do this.

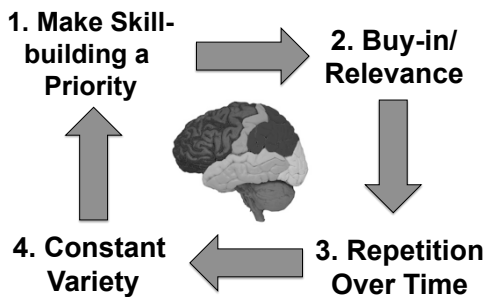
Kids From Poverty Statistically Have Poor Working Memory Which Typically Impairs These Cognitive Processes:

- following directions
- math skills
- problem-solving
- reading comprehension
- writing skills
- prioritization
- study skills



Source: K. Shields, M. John, D. Nunez, J. A. Hershov, & Bruce, W.T. (2011). Family socioeconomic status and child executive functions.

How Do You Boost These Skills?



How to Maximize the Value of Any Skill-Building Activity

- 1) Get **critical buy-in** for focused attention!
- 2) Suppression is *more important* than activation; **trial & error learning is a must!**
- 3) Use continual boosts in task challenges with **incremental increases** from baseline
- 4) More time on task = greater permanence; use **5-55 min./day, 3-5x/wk. for 4-16 weeks**

First, Increase Buy-In

K-5 STUDENTS:

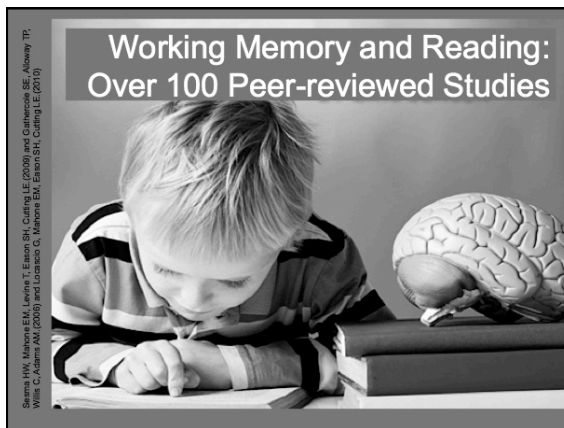
Use the “bigger kid” challenge, simple reward, teacher enthusiasm, curiosity, affirmation, friendship-maker, be gross and use mystery.

GRADE 6-12 STUDENTS:

Be edgy/risky, use peer pressure, challenge, stair-step the activity, cooperative, status-builder, experimental and use relationship.

Working Memory

1. Working memory is **the driver of cognition**. It's required for problem solving, language, math, prediction and higher order processing.
2. Research shows that kids in poverty have **weaker working memory**.
3. Working memory is a **teachable skill**. Give students practice in this skill daily.



Stress Impairs Memory

- Chronic stress impairs *working memory*.
 - Acute stress impairs *working memory*.
 - *Chronic and acute stress impair neurogenesis, which regulates learning, memory and mood.*
-
- Loehlin M, Meier B, Sordic C. (2009) Stress effects on working memory.
- A diagram of a human brain with several grey circles of varying sizes scattered around it, representing stress or its effects. The text 'Stress Impairs Memory' is at the top. Below it are three bullet points. At the bottom left, there is a vertical list of authors and their year: 'Loehlin M, Meier B, Sordic C. (2009) Stress effects on working memory.'

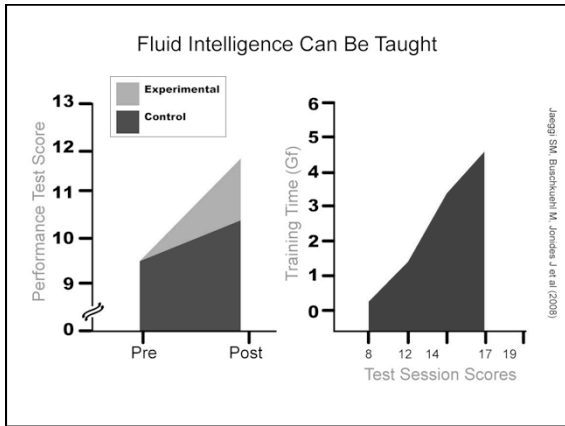
Working Memory and Math Correlation? Over 100 Studies

Studies have demonstrated that working memory is a mediator and top predictor in mathematics achievement in primary school age children.



Solutions to Working Memory Limitations in Students

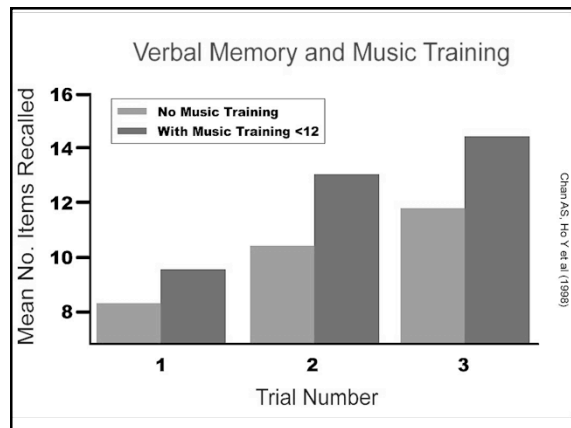
1. Use the “pause” technique. Every few minutes, pause to let content sink in.
 2. Chunk content into smaller chunks to aid understanding, then review.
 3. Prime the learning to create an attentional bias to the content.
 4. Do a fast physical activity 1st to activate frontal lobe uppers like dopamine and norepinephrine.
- (Bower 1987), (DiVesta et al., 1979) and (Sah 1994).



Use of Games for Skill-Building Working Memory

Scientific, research-based online games can build working memory. Go to www.cogmed.com

- ### Strategies for Working Memory
1. Call-response s _____
 2. G ____ (Simon Says, cards, etc.)
 3. Cl ____ repeats
 4. Repeat the d _____
 5. Partner/group practice w/# add-ons
 6. Repeat prior e _____, then add a sound, word, or sentence
 7. Partner, buddy or teacher speaks, student wr _____ the content



Interventions Enhance Short-Term Memory in Stressed, Low SES Kids

Short term memory is diminished by short-term stress and chronic stress. (Newcomer, et al., 1999). (Evans and Schamberg, 2009).

But parental training in cognitive skills improved infant outcomes. (Bugental, Schwartz and Lynch, 2010)

Memory is a critical and teachable skill in kids from low-income families!

Working Memory is Free, Easy to Build and It's a Teachable Skill

If You Don't Teach It, Don't Punish Kids for Not Being Good At It.

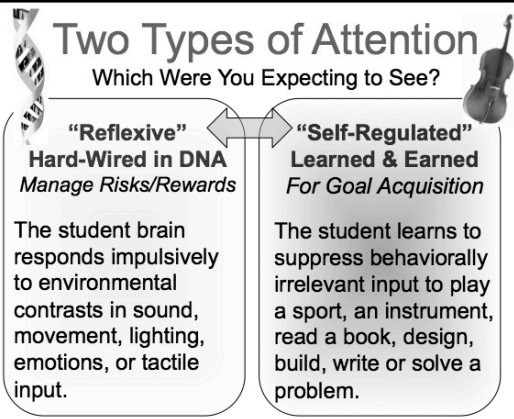
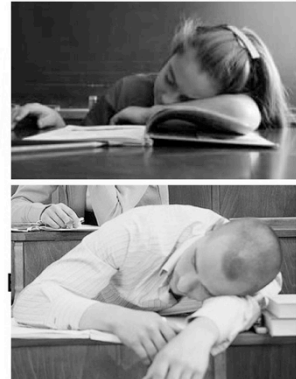
Klingberg T, Fernell E, Olesen P, Johnson M, Guadagnoni P, Dahlström K, Gillberg CG, Forsberg H, Westerberg H (2005)

Today We Focus on 2 (of 7) Key Skills to Build Academic Success

- ✓ Memory (working)
- ✓ Attentional focus



Stop Telling Kids to "Pay Attention!" and Start Teaching Them *How to Do It*



To Get Student Attention...

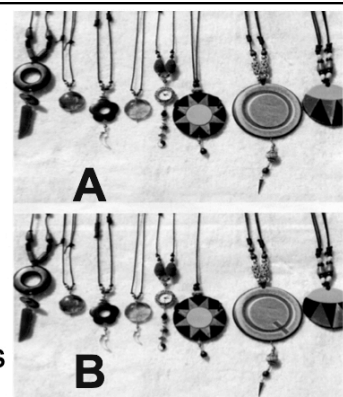


- ✓ Re-directs _____
- ✓ Social nudges _____
- ✓ Novelty _____
- ✓ Daily rituals _____
- ✓ Students up front _____
- ✓ Goal acquisition _____

Building Attentional Skills

- Partner and teamwork on rapid, detailed learning projects
- Theater, drama or dance lessons
- Specialized co_____ programs that focus on skill-building (or games like Play Attention, etc.)

Teach Attention to Visual Detail (3-7) with "What's Different?" Tasks Using Two Pictures



Building Attentional Skills

- Engaging writing practice
- Extreme high interest r _____
- Playing a mu _____ instrument
- “What’s different?” activities

Attentional Focus is Free, Easy to Build and It’s a Teachable Skill



- 1) Make the Content More Engaging and Relevant **Or,**
- 2) Teach Students How to Develop This Skill.


Dr. Marc Barnes © Differentiated development of visual attention skills in school-age children. Vision Res. 2013; 4(2): 27-36. doi:10.1016/j.visres.2013.05.001. Available online at www.sciencedirect.com. ScienceDirect. www.sciencedirect.com

What Skills Matter Most for the Student’s Academic Success?

- ✓ Processing
- ✓ Attentional focus
- ✓ Self-control
- ✓ Working memory
- ✓ Prioritization
- ✓ Ordering/sequencing
- ✓ Deferred gratification

Brockton Public High School

- 4,200 Students
- Title 1 “Failing” school
- Collaboration among staff resulted in a school-wide program to boost sequencing, processing, memory and thinking skills by using a writing emphasis.
- Failing rates in math fell from 77% to 15%
- Failing rates in reading fell from 44% to 5%




BROCKTON HIGH SCHOOL

How to Maximize the Value of Any Skill-Building Activity

- 1) Get **critical b**_____ for focused attention!
- 2) Suppression is *more important* than the activation; **tr**___ and **e**___ **learning is a must!**
- 3) Use continual boosts in task challenges with **inc**_____ **inc**_____ from baseline.
- 4) More time on task = greater permanence; use **5-55 min./day, 3-5x/wk. for ___ weeks.**

Inclusion vs. Pullout Classes

Low SES kids (and others) need *specific, customized, monitored skill-building activities for 30-90 min./day*. Unless the entire inclusion class is doing the specific skill-builders, kids will not get these skills from simply joining an inclusion class. A hybrid schedule (some of each) usually works best. Make skill-building a priority!



S-H-A-R-E

Themes for Success

- S - Skill-Building
- H - Hope & Growth Mindset
- A - Accommodations
- R - Relationships
- E - Enriched Engagement

Skills Matter, But What Affect Will Ensure Academic Success?

1. **Hope** to fuel long-term effort (they must feel the *end point* is possible)
2. **Growth mindset** (belief that *the process* is possible and desirable)

Hope mobilizes our resources. When we believe that success is possible, we try harder and we explore more options. We focus on results, not excuses. We work with, not against the teacher.

The Value of Hope



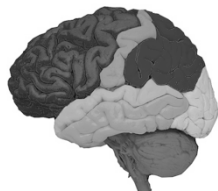
Hope May Be the Single Most Essential Ingredient

Hope is positive expectancy. It improves brain chemicals. That increases mood and persistence, which increases the results. Even if you do everything else right, if the student doesn't think you believe in him/her, you'll lose ground. Most of these kids have had enough negatives. *They need real, persistent hope.*



If You're Offering Only Content Without the Positive Mindset and Skill Sets, Your Students May Struggle; it Takes the "Whole Package"

- ✓ Build Skills
- ✓ Build Attitudes



These are powerful capacity builders!

Key Factors that Foster Hope

1. Supportive Rel _____
2. Skill-b _____
3. Pos _____ R _____ models
4. Af _____ by Authorities
5. Setting and getting _____
6. Compelling personalized v _____
7. Perception that it's getting b _____
8. Faith and pictures of those who m _____ i _____
9. Do ser _____ wo _____ as a class



How to Fuel the “Growth Mindset”

- Affirm effort, not talent. (“I like how your hard work paid off!”)
- Teach students that the brain is malleable; it can change through efforts and IQ is not fixed.
- Tell success stories about those who overcame obstacles through effort and strategy, not through genetics or family connections.

The “Growth Mindset” Raises Math Scores

Blakeslee, L. S., Trzaskowski, K. H., and Dweck, C. S. (2017)

Two groups of 7th graders (N = 373) were tested. The experimental group was taught that IQ is malleable, given affirmations about effort, attitude and strategy. The control group had typical teaching. Over two years later, the control group continued downward, while the “growth mindset group” had higher test scores.



Why You’ll Want to Build Each Student’s Growth Mindset

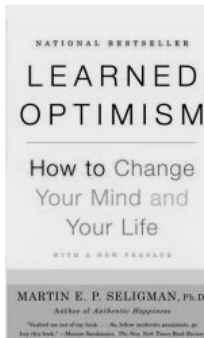
- Research suggests it is a **core attitude** for cognitive growth
- It is **teachable** and available to every student on your campus
- The focus is on **attitude, effort and strategy** (NOT luck, genetics, friends, or family money)

Key Factors that Develop the Critical Growth Mindset

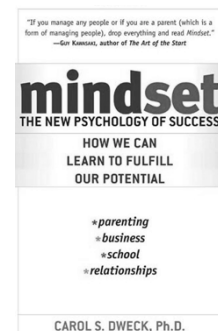
1. **Value of e_____** is more important than “talent.”
2. **The process of learning** is as, or more, important than the _____.
3. **Learning from m_____** is critical.
4. **Stop labeling** kids as “s_____” or “bri_____” instead acknowledge only the students e_____, st_____ or at_____.

Martin Seligman

Teach Optimism and the Growth Mindset (if you don’t, who will?)



Martin Seligman



Carol Dweck

What are Accommodations?

Accommodations are not a special gift, a bonus, extra or an unfair advantage. What they do is to “level the playing field.” They create equal and fair access. You would never be critical of a student who needs to sit in a wheelchair in your class. But how do you feel about students who have a disability like a stress disorder or AD/HD? How about students who lack reliable food, transportation or supplies? Accommodations simply make things more fair.

Key Factor: Accommodations

Kids from poverty are more likely to have challenges with:

- Transportation
- Medical/Health issues
- Parental support
- Prioritizing academics
- Short-term memory
- Anything that costs money
- Emotional/Social regulation
- Organizational skills/supplies

Wired to Be Social: Ultrasound Activity Suggests Prenatal Social Brain Evidence



Castello, et al. (2010) Wired to be social: The ontogeny of human interaction.

Researchers used ultrasound on five pairs of prenatal twins for the study. In the womb, twin fetuses recognized and responded to the other twin. They touched slowly and delicately around the other's face and were less cautious towards other areas in ways that suggested prenatal awareness of their body.

Students are Hard-Wired to Affiliate, Seek Acceptance, and Prefer Peer-Bonding

Yet much of their day they are disciplined for talking, texting, joking, passing notes, bonding and seeking friends.



Lewis, G.J., Bates, T.C. (2010) Genetic evidence for multiple biological mechanisms underlying in-group favoritism.

When your classrooms and schools are run the way the brain naturally works, the kids will start learning and quit annoying you!

The Social Brain Runs Your Kid's Lives! *But How?*

Baby's job #1 – finding and managing relationships (=security)
Children job #2 – acceptance by peers (=socialization)
Adolescent #3 – compete with peers (=pursuit of status)



Relationship Building Means...



- Staff to s _____ (builds security)
- Student to s _____ (builds affiliation and sense of belonging)
- Staff to s _____ (collaborative role models for kids)

Relationships Checklist...

- an assigned mentor for every student (or were you going to wait until they drop out?)
- a collective school “family” (the first class of the day is perfect for this)
- a team/group or club to belong to (teams create a sense of belonging)
- an activity for each student to learn names and more of every student in class (they won’t likely do it on their own)

Quality Relationships Provide a “Margin of Error” for Teachers

When you shoot for the target, if you’re off (but close) you’ll still hit it!



With no close relationships, a small error is a big miss!



Relationship & Status Builders

- ✓ Call students by last name: “Mr. Jefferson” or “Ms. Wilson” to learn and earn respect.
- ✓ Rotate (and reframe) classroom jobs so everyone can get status roles over time
- ✓ Create directory of all students that lists positive skills and/or qualities
- ✓ Honor and appreciate differences
- ✓ Include students more in the running of your class and school (planning, eating lunch, etc.)



**I LOOK FOR
THE GOOD IN
MY STUDENTS**

www.jensenlearning.com

Quit Inhibiting Student Pursuit of Social Status! *Instead...*

- Encourage pursuit of skill sets that will lead to academic success (e.g. arts, sports)
- Encourage ethnic pride
- Encourage activities which help students feel special (positions of leadership, responsibility and those that showcase unique talents)



Status and Affiliation are Critical; If You Don’t Provide Them *Your Way*, Students Will Get Them *Their Way!*

You’ve got a choice: build relationships, affiliation, engagement and status in ways *that you choose* every day...

OR

Deal with students who give up, act out, disrupt your class or even join gangs.

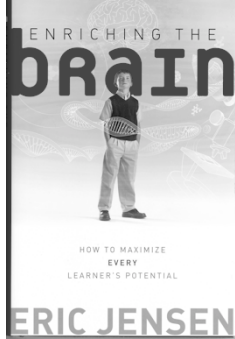
K-2 level 1. Relationship building	Invest Time in Your Students Differently as Their Social Brain Matures
Grades 3-5 1. Relationships 2. Affiliation	
Grades 6-12 1. Relationships 2. Affiliation 3. Status-building	


S-H-A-R-E
Themes for Success

S - Skill-Building
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R - Relationships
E - Enriched Engagement

What Enriches the Brain?

What builds the brain and what reduces damage? Major research project identified the most significant change factors for positive good in the human brain.




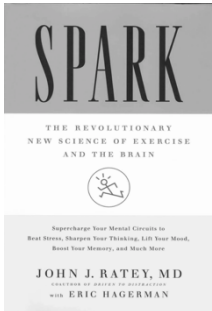
For Engaged Enrichment, Use Every Minute of Class Time 

1. Why? Start with...168 hours
2. Students have about 40 “open” hours per week for 36 weeks = 1,440 hours. Add hours for non-school weeks = 2,480 total hours per year.
3. We provide just 25-30 hours a week of school time for just 36 weeks a year or a total of 1,080 hours (maximum) per school year.
4. We have less than 1/3 of their total hours.

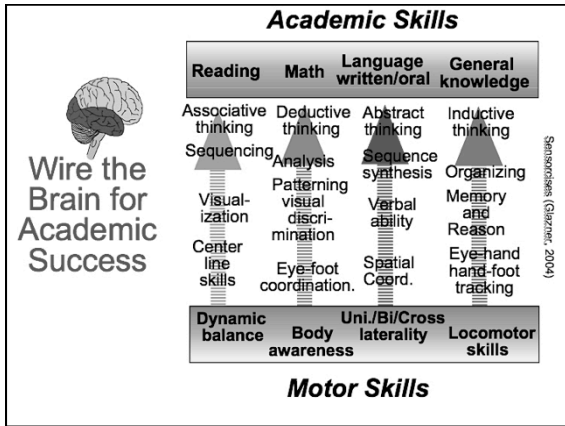
Enrichment Curriculum

- Activity
recess, games, energizers and PE
- Arts
musical, visual, dance & performance
- Advanced Placement
Project Lead the Way, STEM, AVID
(If you don't think your students can handle this curriculum, build their key “skills” first.)

Evidence that Physical Activity Enhances (not hurts) Test Scores

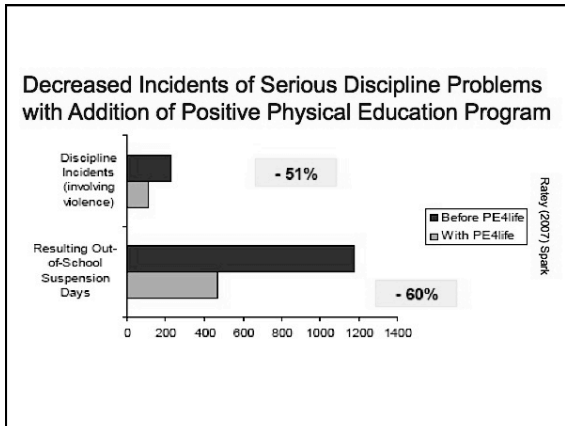
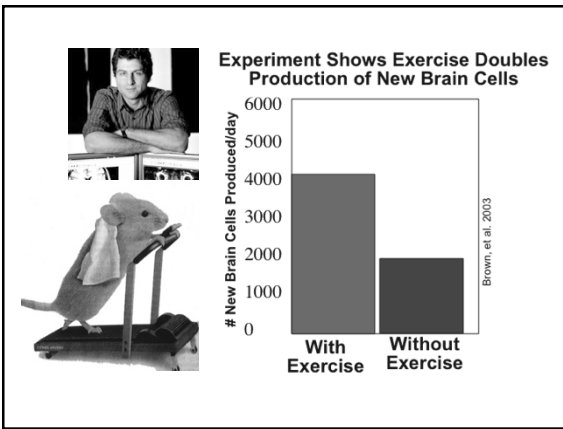
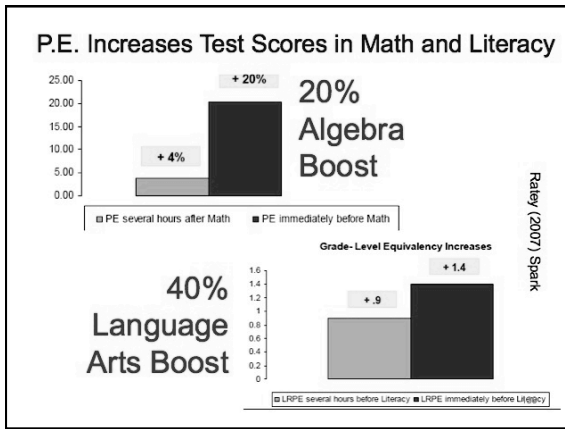



Harvard Professor
Dr. John Ratey



Movement Program Ages 4-8

S.M.A.R.T. "Boost-up"
by Dr. Lyelle Palmer
www.themlrc.org
programs



Why VGM Activity?

UPSIDE: Increases BDNF, amines and neurogenesis which support better cognition, mood and memory

WHAT IT PREVENTS: the devastating effects chronic stress which include reactivity, lower neurogenesis, poor memory and lessened creativity and social skills

Exercise...30 min./day, 3-5x/wk. and Student Success

- Triggers BDNF growth factors (Kesslak et al., 1998)
- Increases brain cells (van Praag, et al. 1999)
- Upregulates serotonin (mood, attention, memory and neurogenesis) (Chaouloff, 1989)
- Raises heart rate (Krock et al., 1992)
- Increase catecholamines (Gillberg et al., 1986).
- Builds cortical mass (Anderson et al., 2002)
- Enhances cognitive arousal (Saklofske, et al. 1992)



Why Arts?

Arts support the development of critical neurobiological systems for ALL subject areas. How does this happen?

Arts build the needed academic subskills like attention, sequencing, processing and memory PLUS the growth mindset.

Do the Arts Support Academics?



Dr. Catterall at UCLA School of Education analyzed the records of 25,000 students progressing from 8th-10th grade. Those who studied arts had **higher grades**, **scored better** on standardized tests, had **better attendance** records and were **more active** in the community. (Fisk, 1999)

Coherent Complexity Builds Connections & Intelligence

1. Field trips
2. Learn to play instruments
3. Business partnerships
4. In-school projects (student store, etc.)
5. Community projects
6. Theater, drama, musicals
7. Service Learning



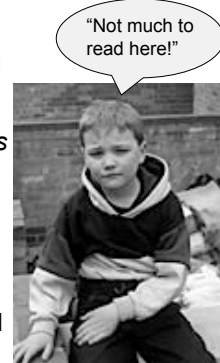
Build Vocabulary Every Single Day

1. Use words that: 1) are on the tests and 2) get their attention.
2. Have a "Word for the Day."
3. Student get credit for sharing their weekly word with 3 others.
4. Writing assignments w/ new words.
5. Kids say, "Caught you!" for word recognition games w/ teacher.
6. Double credit for kids speaking or writing the new word.
7. Teacher role models complex words.
8. Give examples they can use as adults in everyday life.



Access to Books for Stimulating the Mind

In 6 L.A. communities, high SES children *had more books in their homes* than low-SES children *had in all school sources combined*. This suggests that low-SES students are less likely to read partly because of limited access to books. Constantino (2005)



Can Students From Poverty Excel in an Advanced Placement Curriculum?



YES! They can and do excel in it. But the schools that succeed also ensure they are prepping their students brains for the program. They build student's "operating system" (their subskills) to ensure success.

Strategies for Engaged Instruction

- Mix social groupings
- Corrective feedback
- Ask, don't tell content
- Celebration of positives

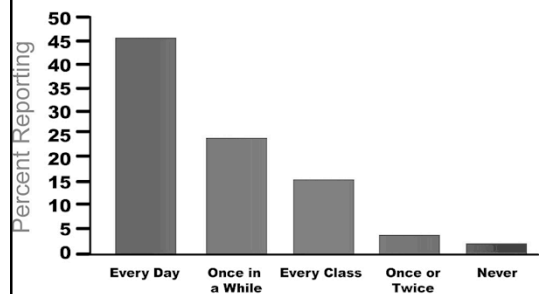


What's it Like in Most High Schools? Let's Ask 81,000 Kids...

Indiana University's High School Survey of Student Engagement (HSSSE) released 2/28/07 showed that almost half the students are bored in class every day. One in six or 17% say they are bored in every class. More than 81,000 students in 110 high schools, ranging in size from 37 students to nearly 4,000, across 26 states were surveyed.

CONTACT: Ethan Yazzie-Mintz Center for Evaluation and Education Policy
emintz@indiana.edu <http://newsinfo.iu.edu/news/pager/home/4948.html>

How Often Are Students Bored?



Yazzie-Mintz (2007)

5th Graders, on average, spend what % of their time listening or working alone (vs. being with others or being more active)?

- a) 25.1
- b) 39.0
- c) 71.8
- d) 91.2

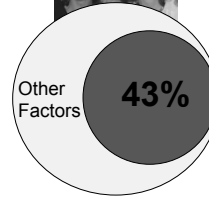


Riordan, et al. (2007) Opportunities to Learn in America's Elementary Classrooms. Science of Learning Vol. 3(1) no. 5024. pp. 179-1798

Let's brainstorm!

Strategies

You have much more to do with how your students turn out than you previously thought



How Much Does Teacher Quality Matter?
43% of the student's academic performance can be traced to the quality of the teacher in the classroom.

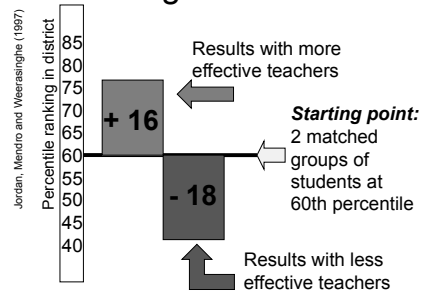
(Marzano, 1998)

Do You Know Your VAS?



- It's the "Value-Added Score."
- That's the amount of increase or decrease any individual student makes annually in your class.
- Kids should make a full (AYP) year's progress (or more).
- Ask your administrator for your own score and learn from it.
- This is just a part of your overall effectiveness.

Importance of Teacher Quality; % Change over 36 Months



Guess the % of Students That Graduate From *This* Public School and Go on to Attend a 4-year University

% of students from poverty = 100%

in student body = 819

Grades = 7-12

% Hispanic = 59%

% Asian = 20%

% African American = 13%

% White/other = 6%

% of attending students whose parents have *no college degrees* = 100%

Ranking in US News & World Report's top 100 = 32



You Pick an Answer... a)18%



b)29%

c)42%

d)77%

e)96%

Question is,
"What % of the seniors of this 100% poverty high school, will go on to attend a 4 yr. university?"

What % of Graduating Seniors at This All Male Public Urban High School in Chicago Attend College?

- a) 44%
- b) 67%
- c) 78%
- d) 85%
- e) 100%



What Was the Voice in Your Head Saying? Fill in the Bubble Below:

- "Where was THAT school?" (If it wasn't in our city, it's not really relevant)
 - "Yeah, but how long did it take them?"
 - "The ethnicity % is different than our school."
 - "Sure, but is it a public school?"
 - "But they don't have the problems we have."
 - "Yeah, but our budget just got cut again."
- or...
"It's good to know that miracles happen!"

"High Expectations" are NOT Enough; the Staff Must Simply Refuse to Let ANY Student Fail.



you deserve to know the truth:

Poverty is...

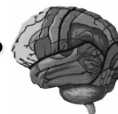
- 1) a _____ condition
- 2) it negatively affects the m____, body and s____ in a synergistic way
- 3) the result of multiple, adv____, risk f____rs

E-A-C-H Difference

Em_____ Support
Acute/Ch_____ S_____
Co_____ Stimulation
H_____ & S_____ Access

1) Can Brains Change for the Better?

Yes or No?



**2) Can IQ change upward?
 Yes or No?**

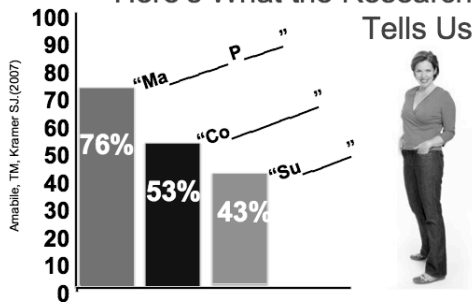
Session Overview

- #1 - Brains Change**
(for the worse and for the better)
- #2 - Achievement Factors**
(learn which factors really matter)
- #3 - Getting on Board**
(it's time for real change)

Getting Staff on Board...



3 Biggest Staff Motivators? Here's What the Research Tells Us



#3 - Getting on Board

(it's time for real change)

1. Staff must **BELIEVE** brains can change
2. Staff need a clear simple **PATH**
3. Staff must actually **SEE CHANGE** happen
4. Staff must **COLLABORATE**
5. Staff need **SUPPORT** from administration

Immediate Solution

- Small staff groups meet by either grade level or subject level
- Use the standards to generate the gap-filling interventions school-wide
- Now, build relationships everywhere
- Combine learn-to-learn activities to master the *academic skills* then add the *hope and growth mindset*.

Poverty Success Model

S _____
 H _____
 A _____
 R _____
 E _____

Let's Simplify...

A – B – C

1. **Agree** on a clear, smart path
2. **“Buy-in”** from yourself
3. **Commit** to implementation

What's My Plan?

WHAT:

WHEN:



Free Brain-Based
Monthly Newsletter



eric@jlcbrain.com

New research,
with practical
applications,
every month.
No charge.

*Simply leave me
your name and
home email
address on any
piece of paper.*