
Welcome
Friends

Every student at Madison Junior High completes a computer-based fitness test

Students spend one day a week in the school's state-of-the-art fitness center.

California Department of Education 2001 Study

33% of freshmen in California were overweight or obese.

Naperville – District 203 – 2002 Study

3% of freshmen were overweight or obese. 19,000 children in the district.

TIMSS – Trends in International Mathematics / Science.

An international benchmarking test comparing the achievement of eighth-grade students . In 1999, Naperville District 203 scored #1 in science and #6 in math. An amazing 94.1% of Naperville parents were satisfied with the PE curriculum.

The History of Learning Readiness PE

- 2005
  - Zero Hour PE
    - 11 Students
    - 7:00 – 7:40 am
- 2006
  - Learning Readiness PE
    - 32 Students
    - 7:45 – 8:35 am
- 2007
  - Learning Readiness PE
    - 2 classes w/36-39 (75) Students
    - 1st period
    - 7th period
- 2008
  - Learning Readiness PE
    - 4 classes w/24 (96) Students
    - 1st period
    - 2nd period
    - 4th period
    - 6th period

Budget comparison of two neighboring schools in 2007

Naperville Central HS

- Per-pupil operating expense $8,939
- ACT scores 24.8

North Shore's New Trier HS

- Per-pupil operating expense $15,403
- ACT scores 26.8

The state average for the ACT are taken by students interested in college was 20.1

- Scored higher on the mandatory state tests
- Scored considerably lower on the mandatory state tests

All students take the state tests not just the smartest and brightest.

Courtesy of Vicky Bonavito AzAHPERD

NEW PE: NOT SHAME AND HUMILIATION

- FLORIDA PE TEACHER GETTING $5 TO LET STUDENTS OUT OF GYM CLASS
- PHIL LAWLER'S RESPONSE
- HARDEST NUT TO CRACK: DUMB JOCKS
- SPORTS IS THE ONLY THING
- TEACHING SKILLS TO KIDS SO OUT OF SHAPE THEY CAN'T STAND FOR 30 MINUTES
- THIS IS THE WAY WE DO THINGS
- PHILLIPS ANDOVER – 3 SPORTS, MANY KIDS STILL NOT FIT- ON THE BENCH.
- NEED FOR PARTNERSHIPS

NEW PE

Fewer competitive activities.

More **activities that emphasize personal achievement –** Not a replacement for Competitive Sports.

Use and **CO-OPT** technology to serve us.
USE OUR CYBER SLAVES

Construct developmentally appropriate curriculum – **PE for BODY and BRAIN**

Builds character & citizenship, teaches how to deal with adversity, and how to give back to one's community.

Includes a wide range of activities

Acculturates a lifestyle of PLAY and ACTIVITY

THE GIFT OF FITNESS

- ***Titusville, PA*** **Once a prosperous town, now a Rust Belt town, has one high school of 2600 students. It installed fitness centers in high school and middle school, bought heart rate monitors and recruited a hospital to help fund diagnostics. Administrators restructured the school day to add ten minutes and shaved time from academic classes to provide for daily exercise. *"It did not cost us a cent to do that"* said a school official. Other teachers use the equipment—English students use heart rate monitors during public speaking and math student use the data to learn how to graph, thus connecting real life with school.**
- ***Improvement:*** **Since starting in 2000, standardized test scores have risen from below the Pennsylvania state average to 17 percent *above* it in reading, 18 percent *above* in math. No reports of fist fights among 550 junior high students since the program began; instead are new reports of students helping each other. The district is now opening the schools' fitness centers to members of the senior center.**

Johannes Skolen Copenhagen, Denmark

School PE *Start* – one time a week *Change*- 5 times a week.

250 students participated, and the intervention scheduled for three months.

- Prior physical activity had consisted of ball play only.
- Physical education department added:

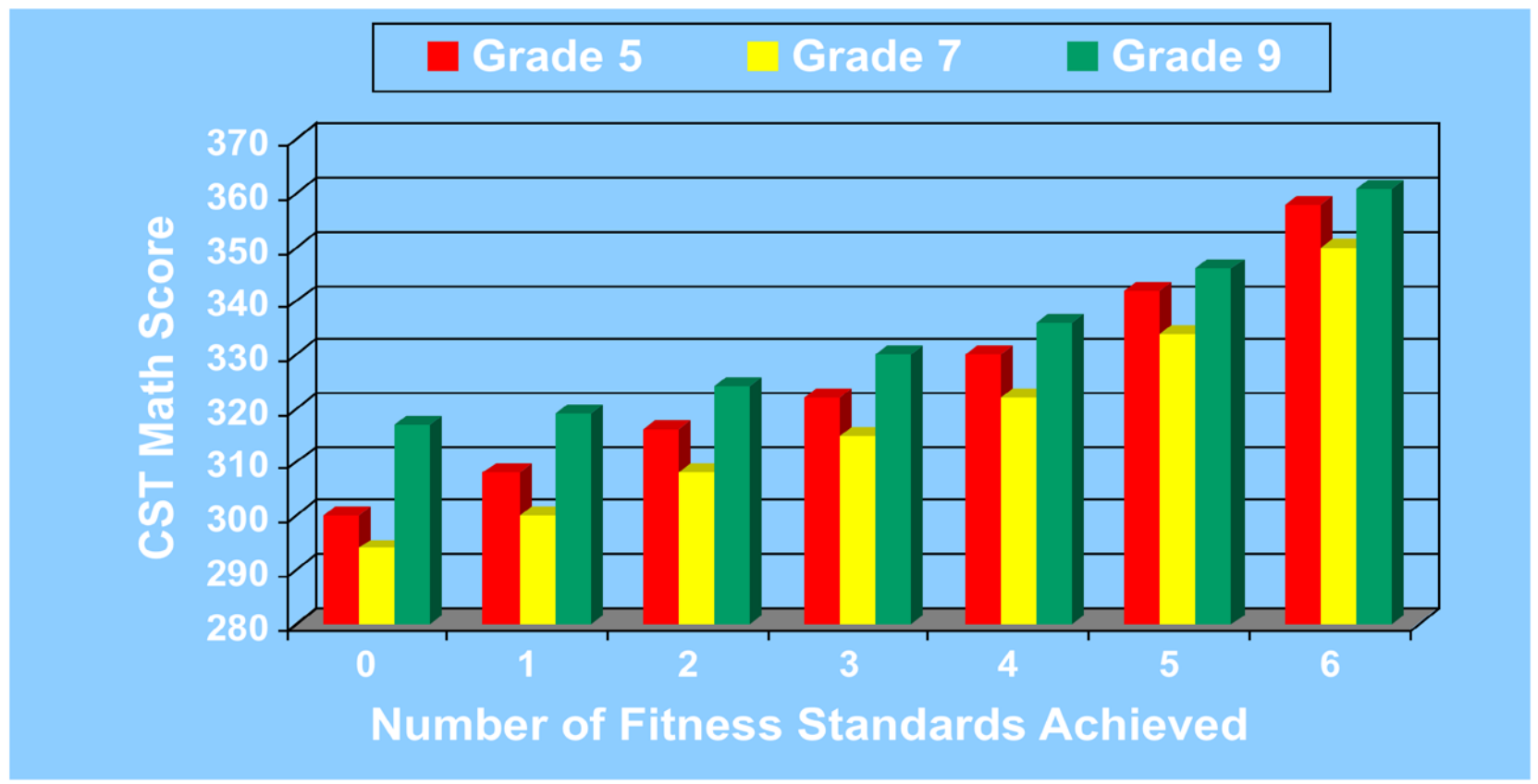
Running, hip hop dance, aerobics, spinning, indoor rowing, and military boot camp training. After school activities were offered every day.

- Food served at school was changed to offer only healthy **"super foods."**
- All **junk food** was removed.
- **Absenteeism** - Decreased by **38%**.
- **Concentration** ability was measured - Improved **33%**.
- Exercise had a major impact on **GRADES** - An average of **1.5 grade improvement** across the board.
- Teachers reported,

"The increase in exercise had great effects on CLASSROOM BEHAVIOR."

2004 Scores in Math by Number of Fitness Standards

Grade 5 – 371,198 Students
Grade 7 – 366,278 Students
Grade 9 – 63,028 Students**

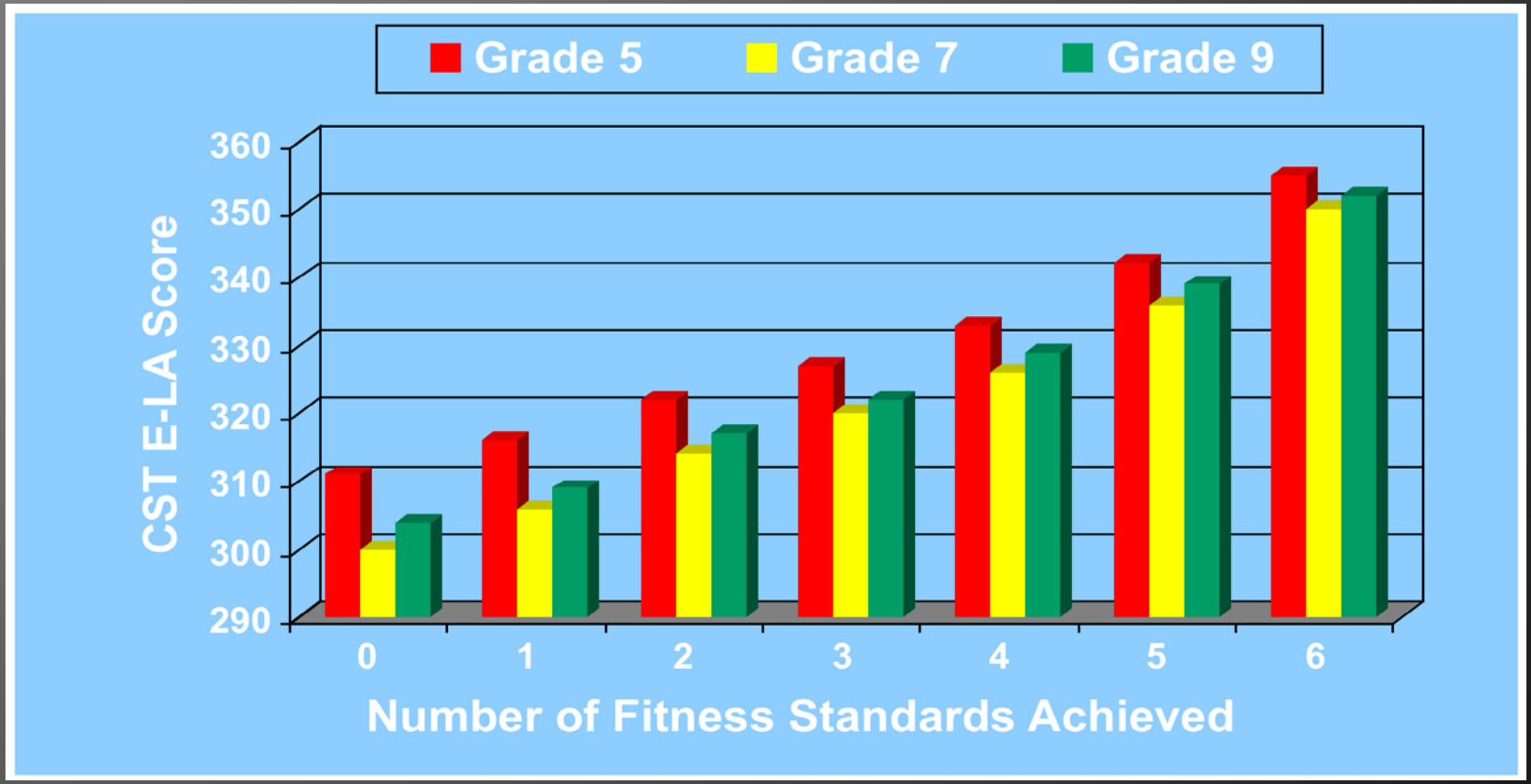


*California Standards Test
** Grade 9 Students who took CST geometry

Source: California Physical Fitness Test, 2004 Results, Calif. Dept. of Ed., April 2005

2004 CST* Scores in English-Language Arts by Number of Fitness Standards

Grade 5 – 371,198 Students
Grade 7 – 366,278 Students
Grade 9 – 298,910 Students



*California Standards Test

Source: California Physical Fitness Test, 2004 Results, Calif. Dept. of Ed., April 2005

Texas Cooper Study 2,600,000

Significant correlations were found between physical fitness and various indicators of academic achievement. The study shows that:

• Higher levels of fitness are associated with better academic performance. Higher performance independent of any demographics: ethnicity, race, income, school

• Higher levels of fitness were associated with better school attendance.

• Higher levels of fitness at a school were also associated with fewer disciplinary incidents. The research looked at the number of incidents involving drugs, alcohol, violence and truancy.

How Far Do I have to Run Today?

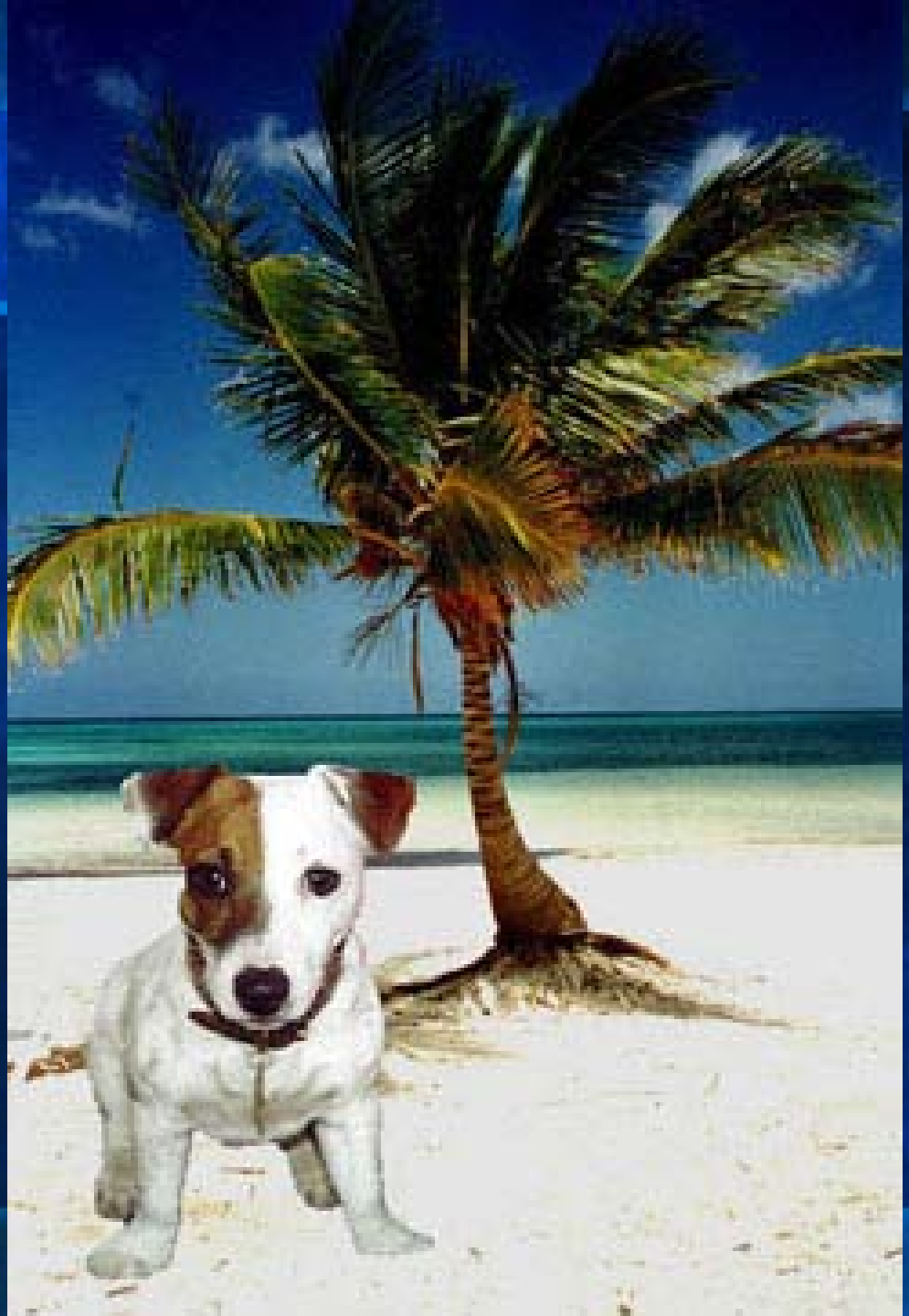
Exercise & Learning

The JACK Effect

NO RECESS

Aloha,

Play often
and play hard
like me.



The Power of PLAY

Play evolved – to promote survival. Play makes the brain smarter - more adaptable - higher animals.

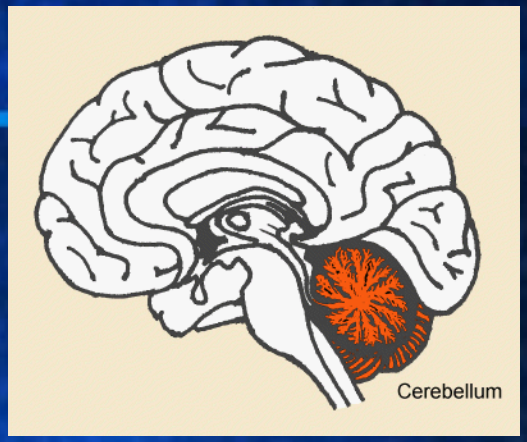
Play is the basis of social contact and group interaction - fostering empathy – The core of creativity and innovation.

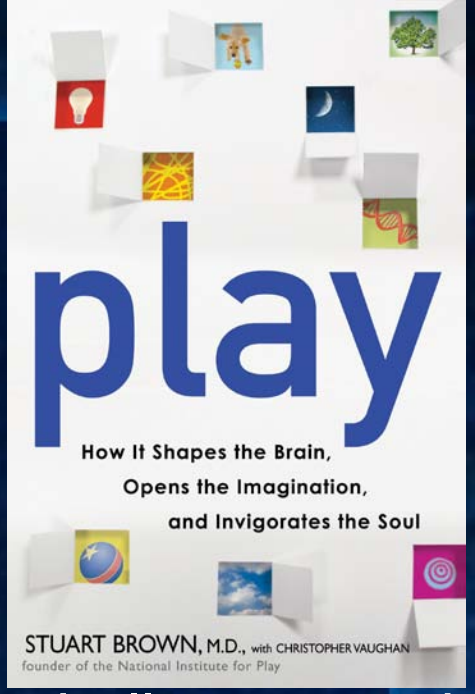
Play gives us the ability to become smarter and more creative, to learn more about the world than the genes could ever teach, to adapt to a changing world.

In a world of continuously presenting unique challenges and ambiguities.. Play Prepares the Player to cope with the evolving planet.

The more recess… the better behaved and attentive the student or worker.

The species with the biggest brain size play the most. Humans should never stop!





Play prepares the player, to cope with the unique challenges and ambiguities of a world that is continuously changing.

The period when maximum play occurs - Ages 3-7 yrs is also the period of the most rapid growth of the cerebellum.

Play is necessary to keep our major brain systems synchronized.

Animals at Play

Stuart Brown describes the pictures of a wild starving, male, polar bear entering the area where a group of huskies were waiting.

The photographer was sure that he was going to see the end of his huskies as this 1200 lb polar bear had not eaten in 4 months., BUT

Shortly, before the Husky was in a crouched bow with tail wagging ready to play

Google: Polar Bear, Husky, Brown.

The Polar Bears returned every night that week to play with the dogs

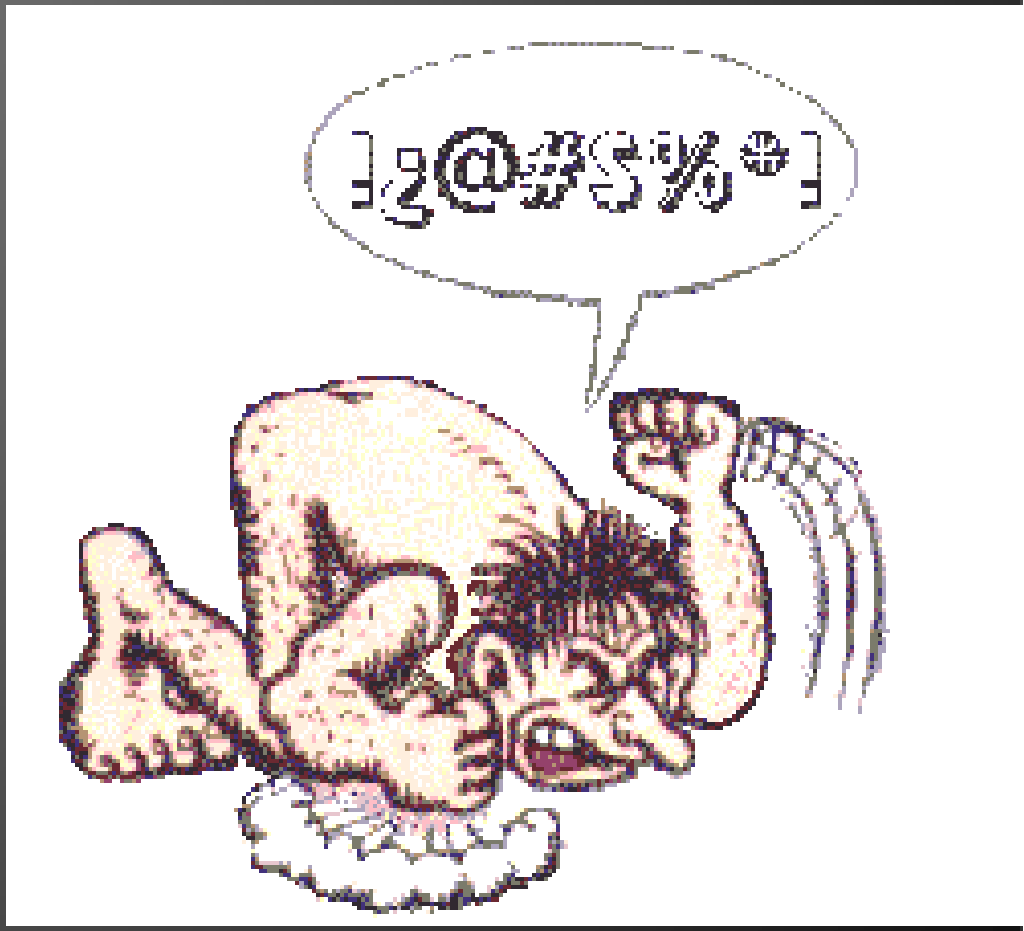
Electronic Media:

Schools with the highest usage of electronic media – TVs, movies, computers – scored the highest on "non promoting of physical activity.

ActiGraph

In schools with more fixed playground equipment, children were less active.

In schools with more portable equipment, i.e. balls and tricycles, children were more active.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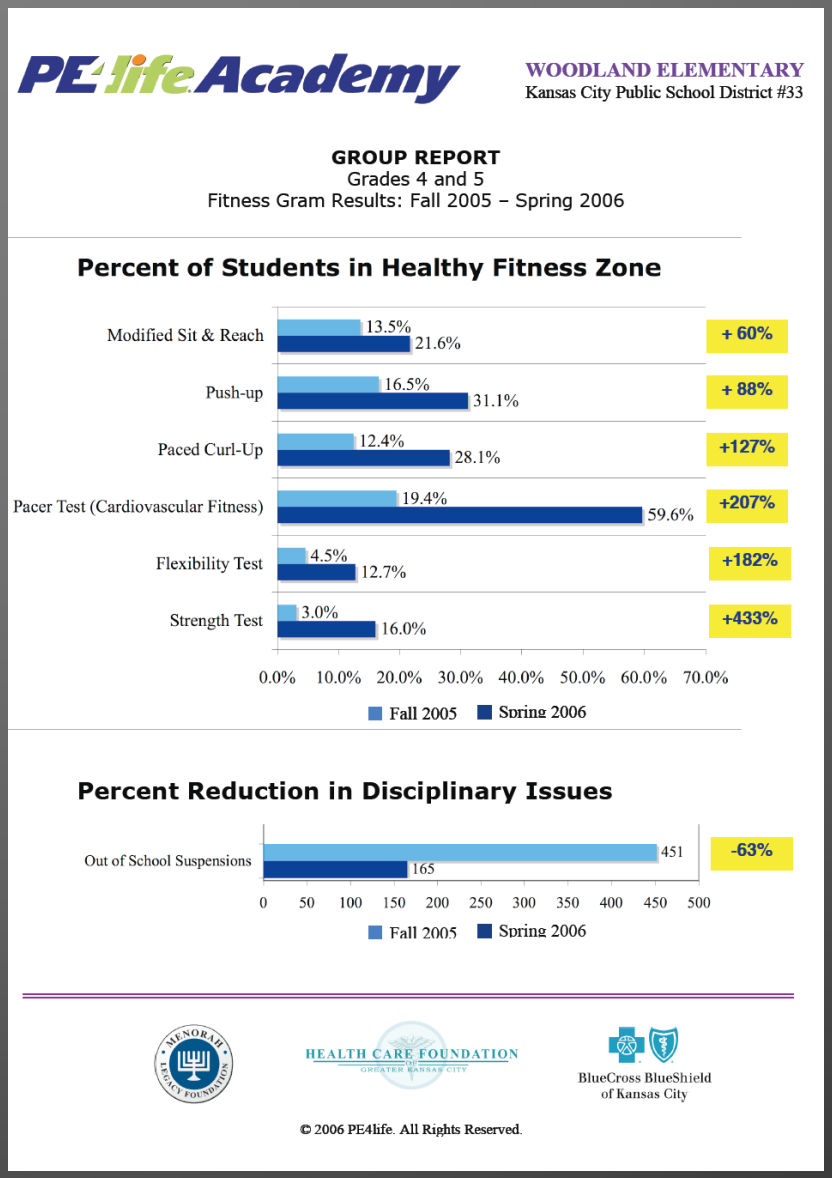
Phenomenon



- Woodland Elementary School

2005 Fall

PE one day per week / 50 minutes.

2006 Jan - June

PE4life Program

Five days a week / 45 minutes.

-Inner city school with

80% of kids on free lunch program

- PE4LIFE added

Cardiac monitored watches,

Dance Dance Revolution,

A few exercise bicycles/fitness machines.

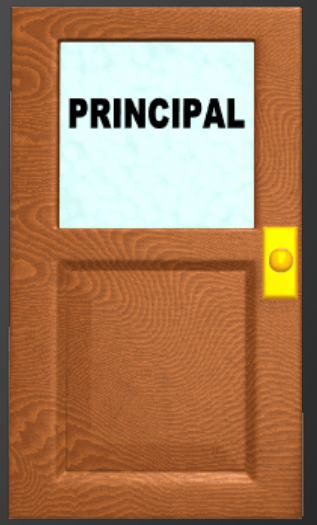
AND A NEW ATTITUDE

CHARLESTON PROGRESSIVE ACADEMY EXERCISE IMPACTS SELF-CONTROL

Public Magnet School Grades 4-8 Approximately 120 children
All on school breakfast and lunch programs.
Program: Added 40 minutes of exercise in the morning
Exercise was performed in gym in station format.

Activities included:

Basketball
Double Dutch" jump roping
Dance Dance Revolution
Pogo stick jumping



1st Semester 2006 - 2007 Outcomes: Disciplinary Referrals

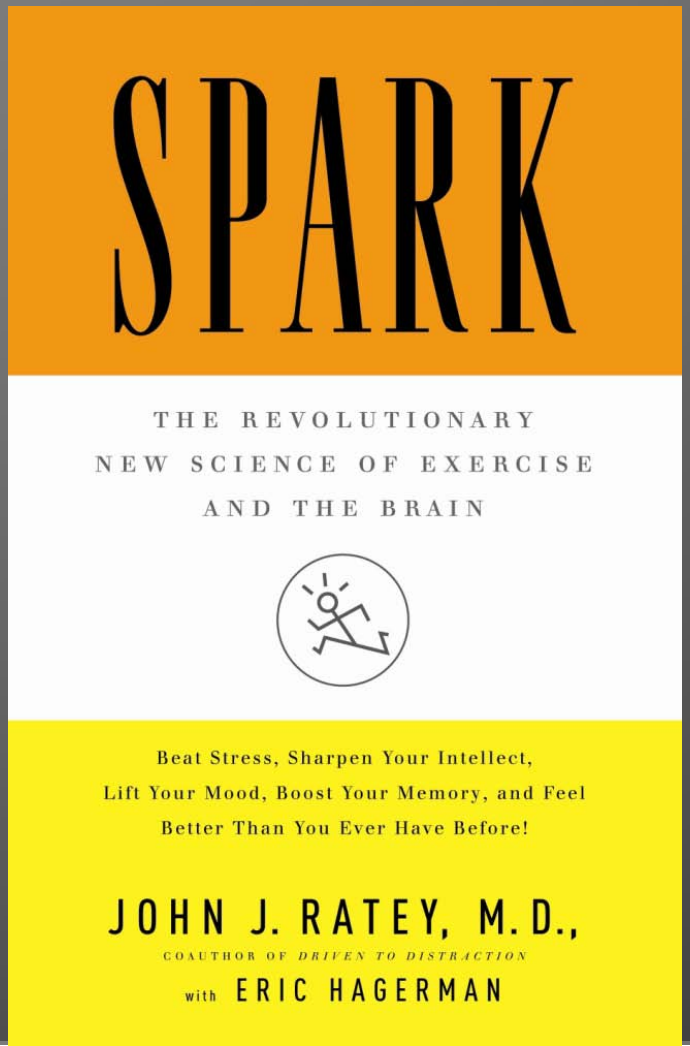
Year	2006	2007
Referrals:	661	353
Suspensions:	71	24

Teachers reported :
Students are more focused. Students are more focused during the MAP (Measure of Academic Progress) testing as well.

Teachers observed:
Students testing immediately after morning activities did better — meeting or exceeding individual growth targets — than middle scholars taking the test late morning or in the afternoon.

ANOTHER EXAMPLE OF SHAMELESS SELF- PROMOTION

www.JohnRatey.com



SPARK is a groundbreaking exploration of the connection between exercise and the brain's performance that shows how even moderate exercise will supercharge mental circuits to sharpen thinking, enhance memory, beat stress, and much more. Dr. John J. Ratey is a Harvard professor and author of the bestseller Driven to Distraction.

COGNITION: Dr. Ratey shows how exercise improves our ability to learn and in fact makes us smarter. After a new fitness program was instituted in an Illinois school district of 19,000, test scores soared—first in the world in science and sixth in math.

HORMONAL FLUCTUATIONS: Exercise is particularly important for women during each stage of the life cycle because it tones down the negative consequences of hormonal changes that some experience and enhances the positive effects for others.

STRESS: Too much stress can sever connections between neurons. Dr. Ratey explains how exercise counteracts this breakdown by increasing blood flow to the brain and creating a surge in protective neurochemicals.

ANXIETY: While anti-anxiety drugs stifle anxiety, they don't help you learn a different response to the underlying fear. Exercise has been proven not only to reduce anxiety but to rewire certain pathways and prevent anxiety.

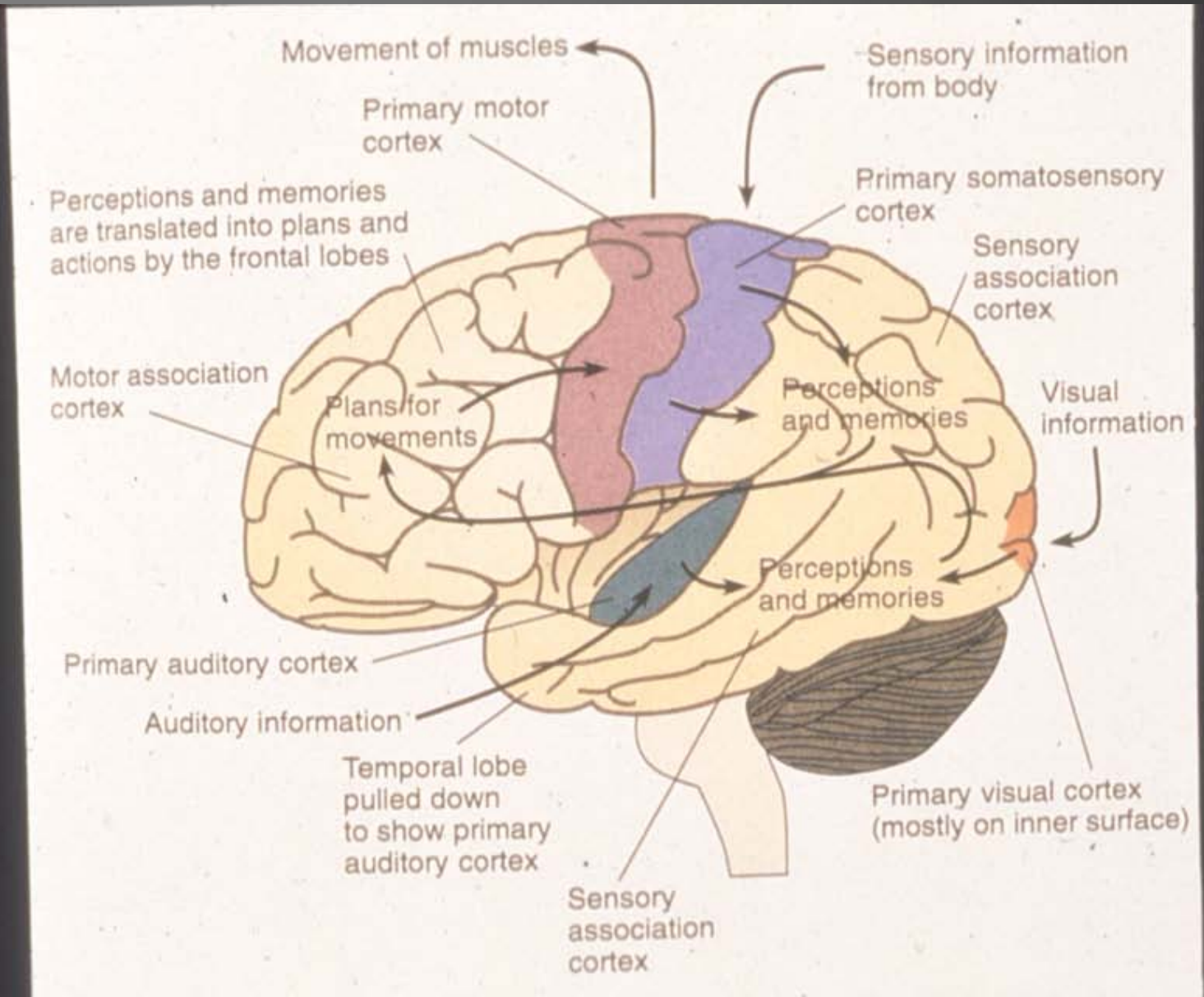
MOOD: About 18 percent of adult Americans experience depression at some point in their lives. Using cutting-edge studies, Dr. Ratey shows that exercise is better than drugs like Zoloft in reducing depression. Exercise elevates endorphins, boosts dopamine, and regulates all of the neurotransmitters targeted by antidepressants.

AGING: Exercise can also help stave off memory loss and Alzheimer's and keep the mind sharp. New research illustrates that women who exercise decrease their chances of dementia by 50%.

ADHD: Exercise increases dopamine, which in turn improves focus and attention. Dr. Ratey explains why he prescribes exercise for treating ADHD in kids and adults.

ADDICTION: Exercise is the perfect antidote to addiction, again because it increases dopamine and so improves the brain's ability to satiate.

ADAPTATION, MOVING, LEARNING



Evolution Movement

Thinking

"*That which we call thinking is the evolutionary internalization of movement.*"

Llilnas, 2001

HUNTER GATHERERS

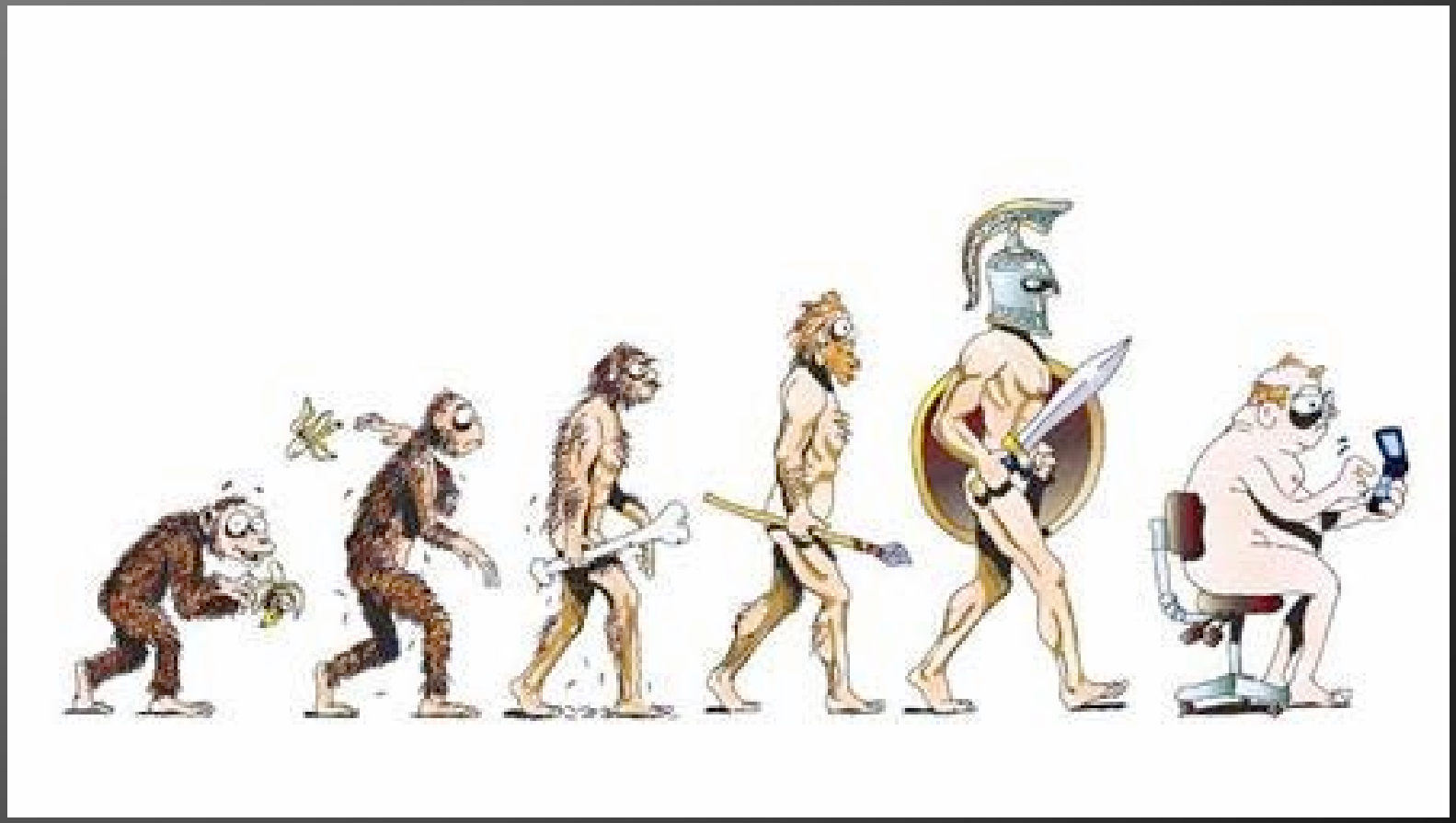
If you did not run, you did not eat

Our early ancestors predominately consisted of hunter-gatherer types ensuring the "Running Man" as a standard of fitness for their survival. If you did not run, you did not eat. Individuals who could out-run & out-plan their peers would survive

Roman legions completed more than one-and-a-half marathons a day carrying more than half their body weight in equipment.

Athens employed 30,000 rowers who could all exceed the achievements of modern oarsmen.

Australian aboriginals threw a hardwood spear 110 metres or more (the current world javelin record is 98.48).



Manthropology: The Science of the Inadequate Modern Male by Peter McAllister

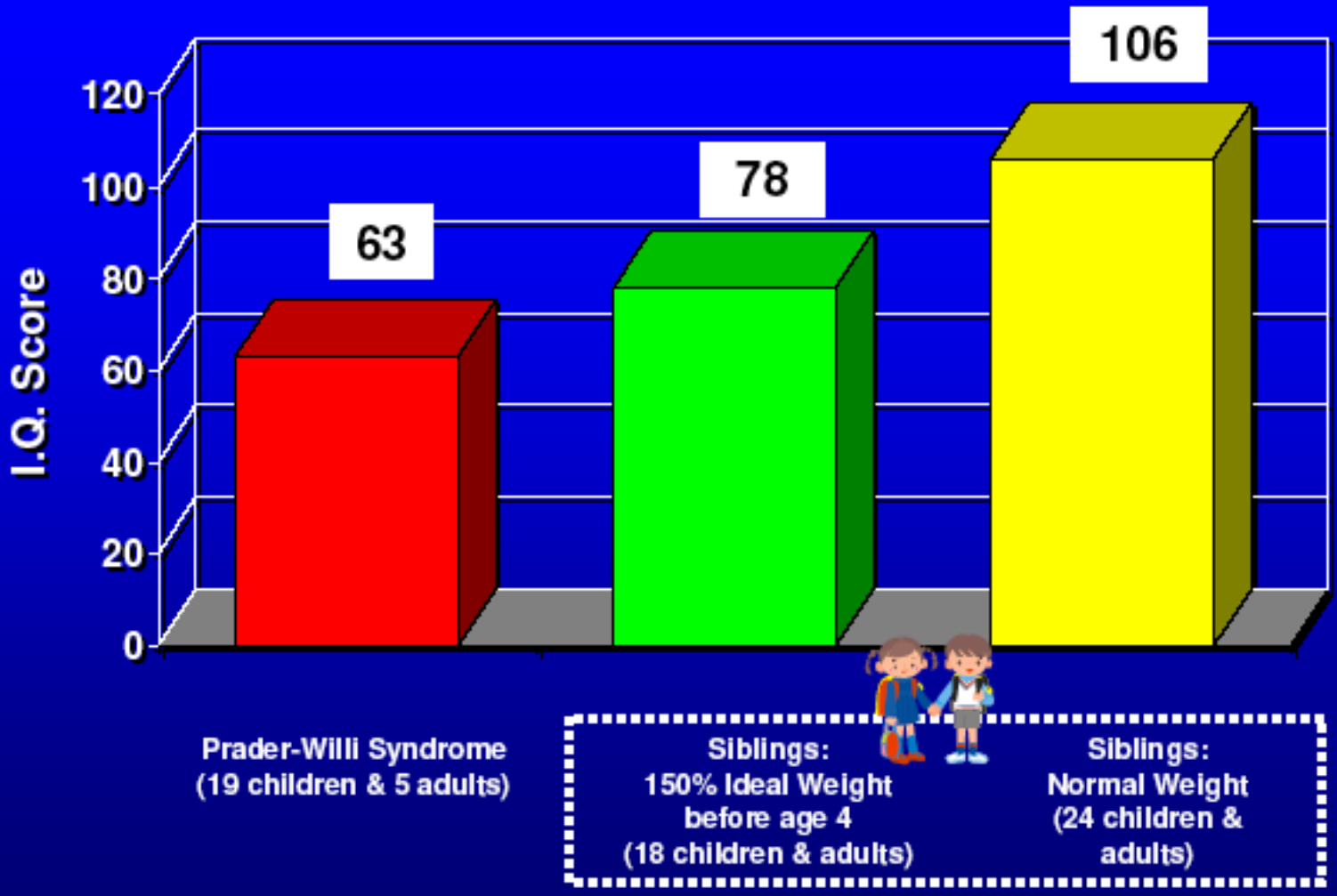
MY GENES MAKE ME DO IT

Thrifty Genes Evolved out of NEED. Conserve

They drive us to load up on calories and take it easy

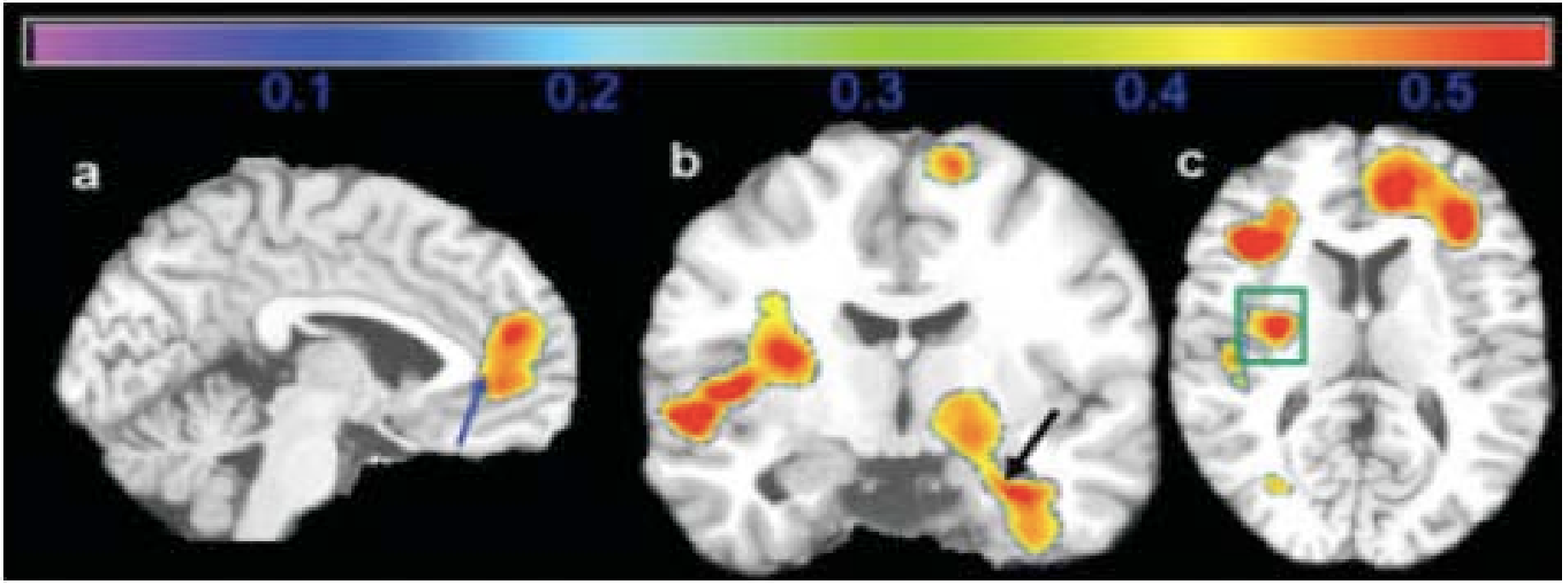
Because tomorrow we will have to **walk for days without food.**

Early-Onset Obesity and Its Effect on I.Q.



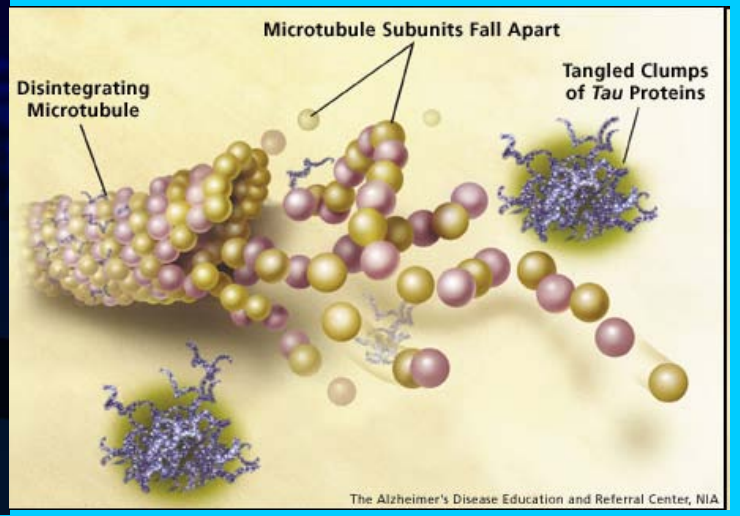
Source: Miller, et al, J of Ped, Vol. 149, Issue 2, Aug 2006, 192-198.e3

Obese Adults Brain Erosion



Correlation map (*r*-value image) effect sizes for a comparison of 14 obese persons (BMI > 30) (avg age 77) to 29 normal weight persons (BMI= 18.5–25). Obese persons had lower Gray Matter and White Matter volumes in the frontal lobes, anterior cingulate gyrus (**a**, blue arrow), hippocampus (**b**, black arrow), and basal ganglia (**c**, green box). Obese people have 8 percent less brain tissue than normal-weight individuals and their brains appear to have aged prematurely by 16 years.

Brain structure and obesity. Raji CA, Ho AJ, Parikshak NN, Becker JT, Lopez OL, Kuller LH, Hua X, Leow AD, Toga AW, Thompson PM. Hum Brain Mapp. 2009 Aug 6.



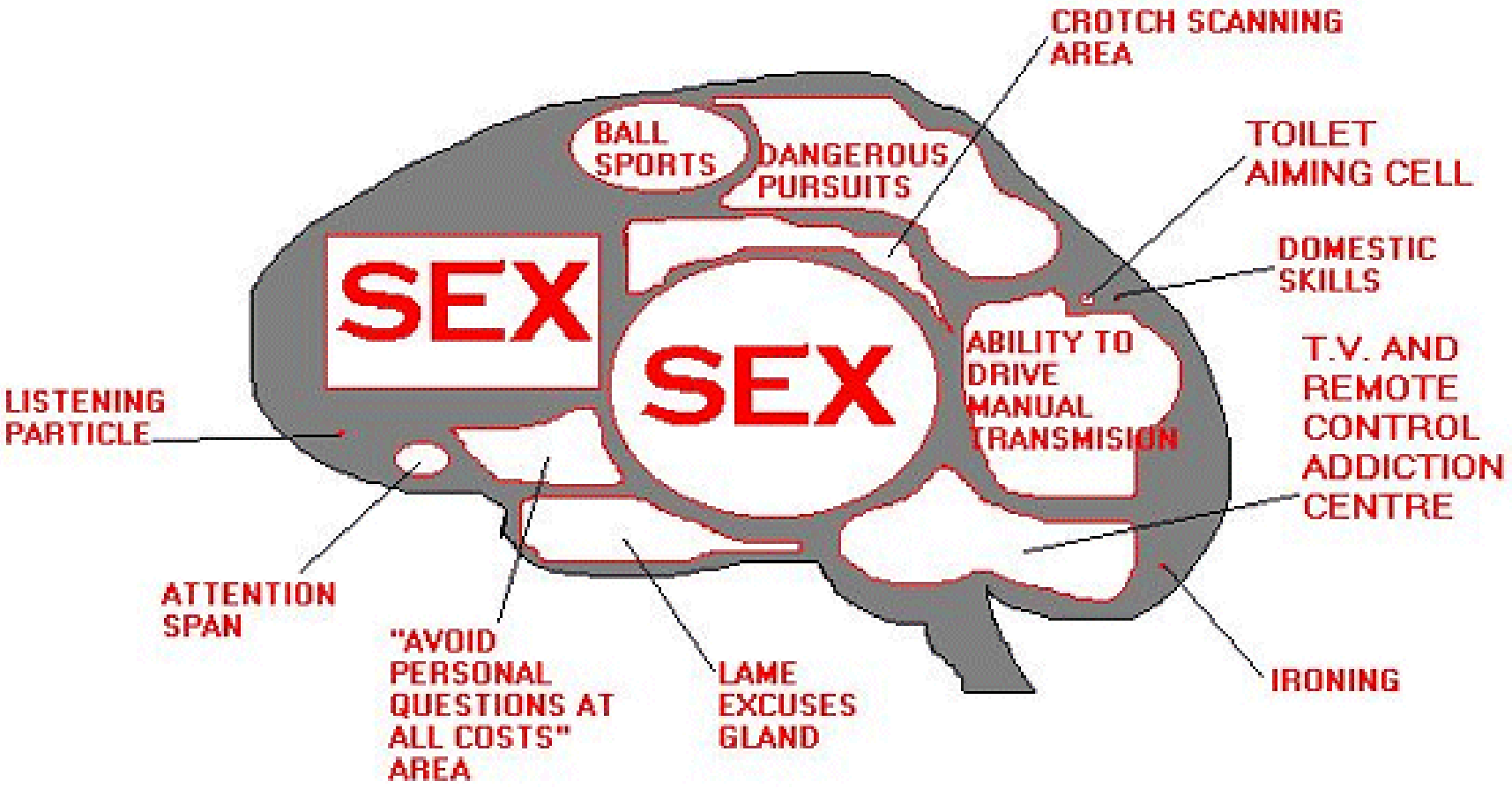
Alzheimer's a new type of diabetes?

Brown Medical Center/Rhode Island Hospital

- **Insulin and insulin receptors reduced in brains of early stage Alzheimer's patients.**
- Deficiency in neurotransmitter Acetylcholine, associated with insulin loss.
- Potential treatment target insulin and its action on the brain.
- A loss of insulin in the brain triggers the onset of Alzheimer's.

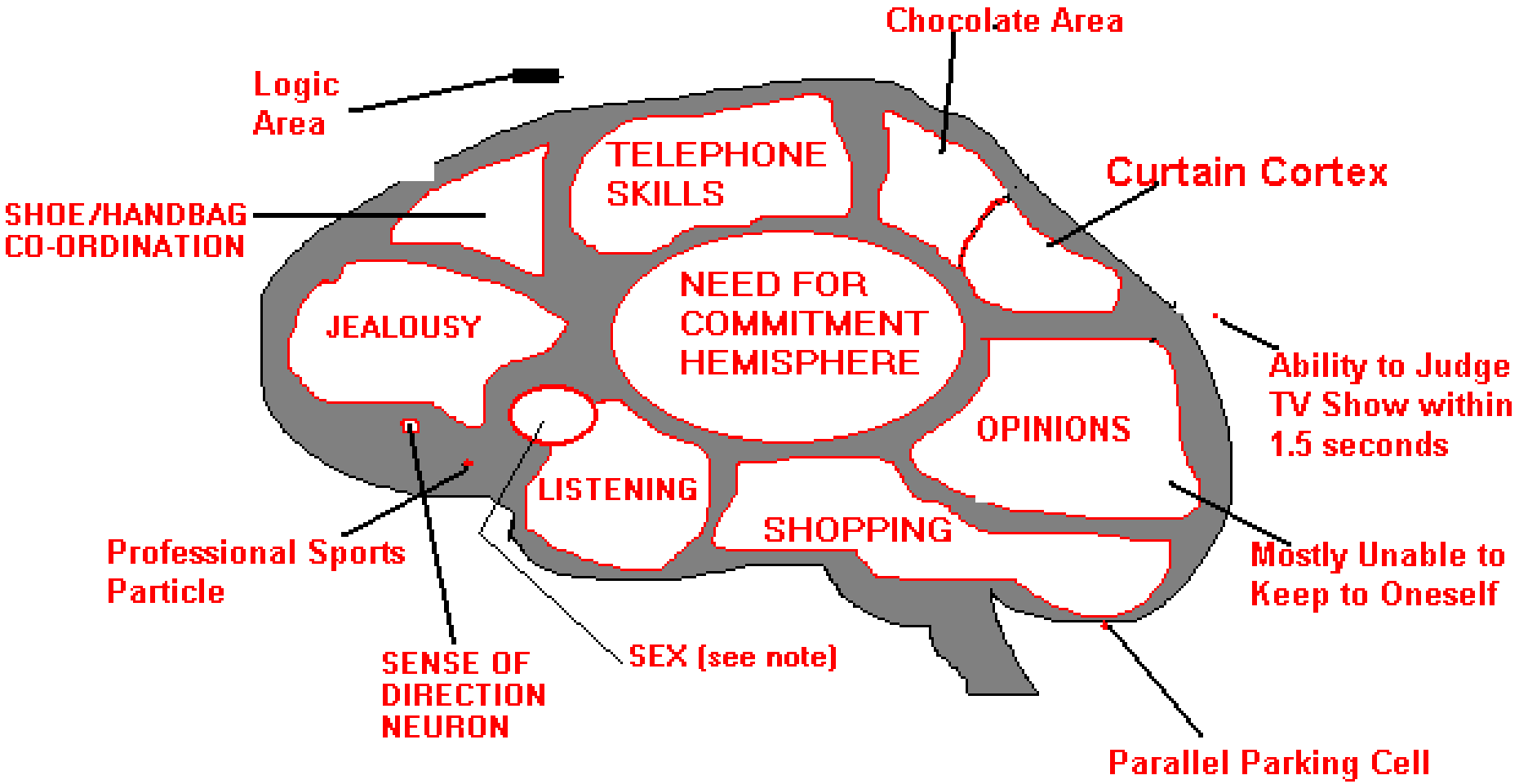
Gender Differences

THE MALE BRAIN



Note: The "Listening to children cry in the middle of the night" gland is not shown due to its small and underdeveloped nature. Best viewed under a microscope.

THE FEMALE BRAIN



FOOTNOTE: Note how closely connected the small sex cell is to the listening gland.

THE MOUSE THAT ROARED

BDNF is a **THE MOTHER OF ALL BRAIN GROWTH FACTORS** which regulate the **survival, growth** & differentiation of neurons during development and is vital to continue our Brain's job of Adapting to the world- LEARNING **.**

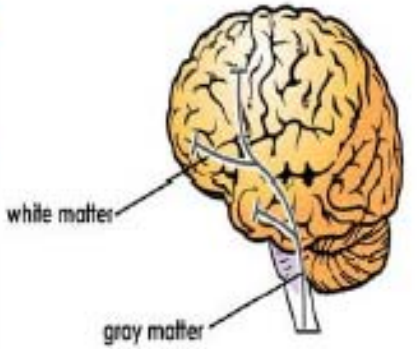
BDNF functions to **translate activity into synaptic** & nerve plasticity in the adult animal.

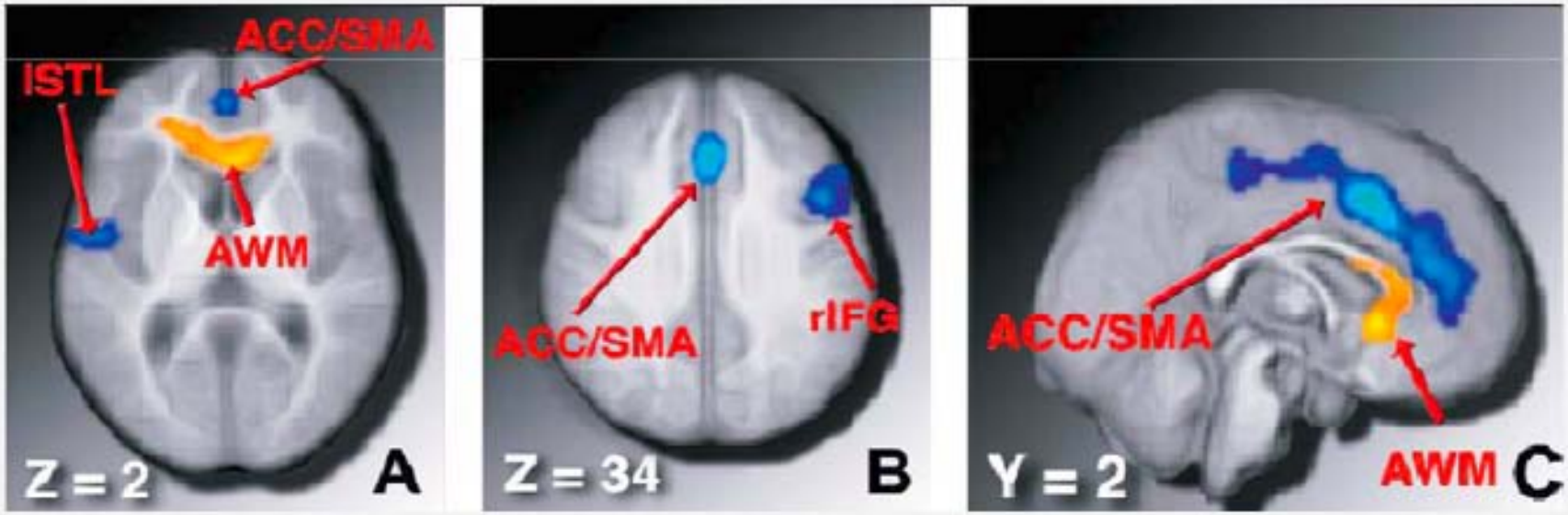
BDNF is MIRACLE GRO for the brain and is Evolution's great gift to us that is made when we use our brain cells.

BDNF is an anti-depressant, anti-toxic stress factor and correlates with intelligence and memory.

Brain Volume Increases With Exercise

Gray Matter Increases for Aerobic Exercisers





Colcombe SJ, Erickson KI, Scalf PE, Kim JS, Prakash R, McAuley E Marquez DX, Hu L, Kramer AF. Aerobic exercise training increases brain volume in aging humans. J Gerontol A Biol Sci Med Sci. 2006 Nov;61(11):1166-70.

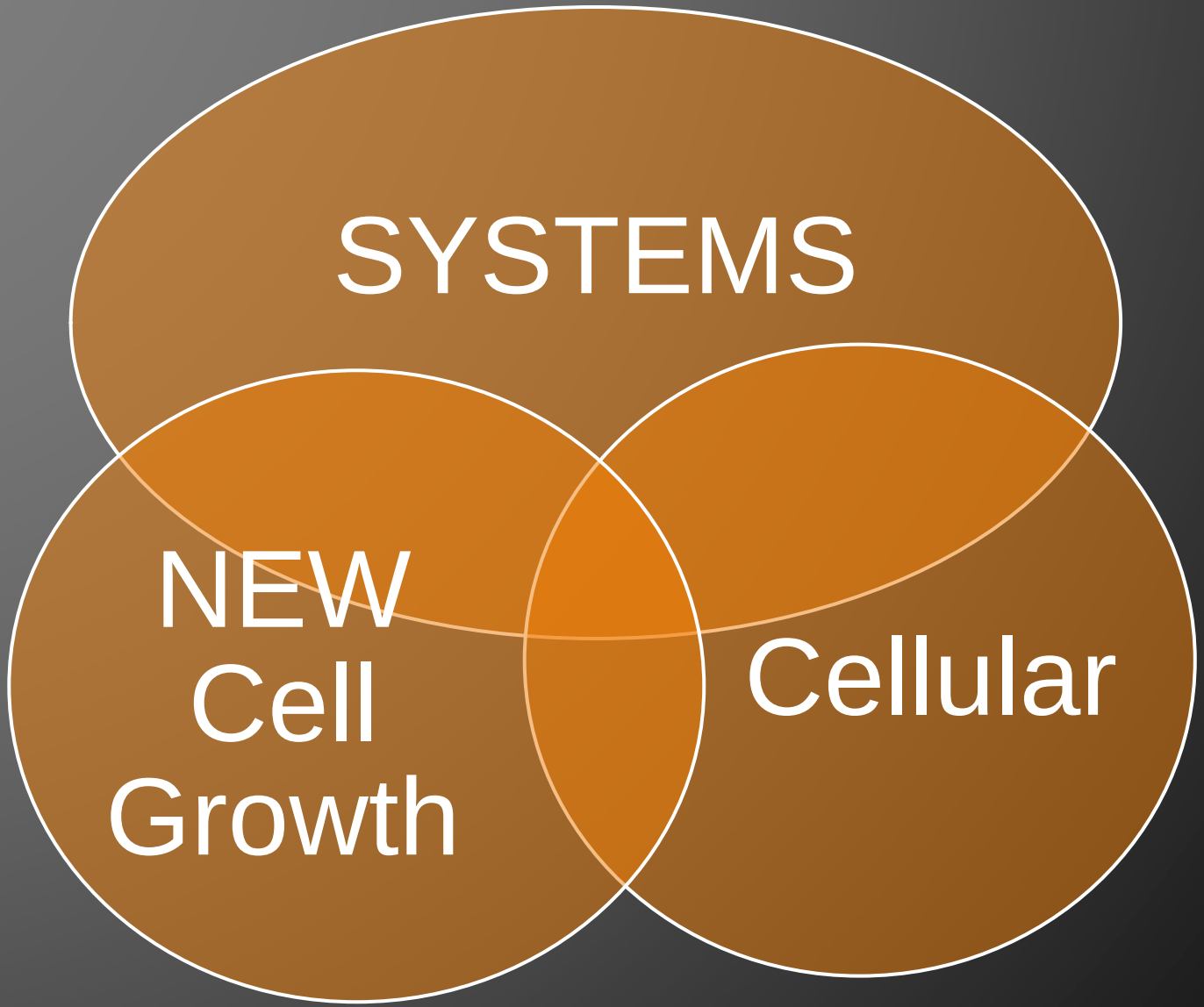

24 HOUR
FITNESS

BRAIN CHEMISTRY

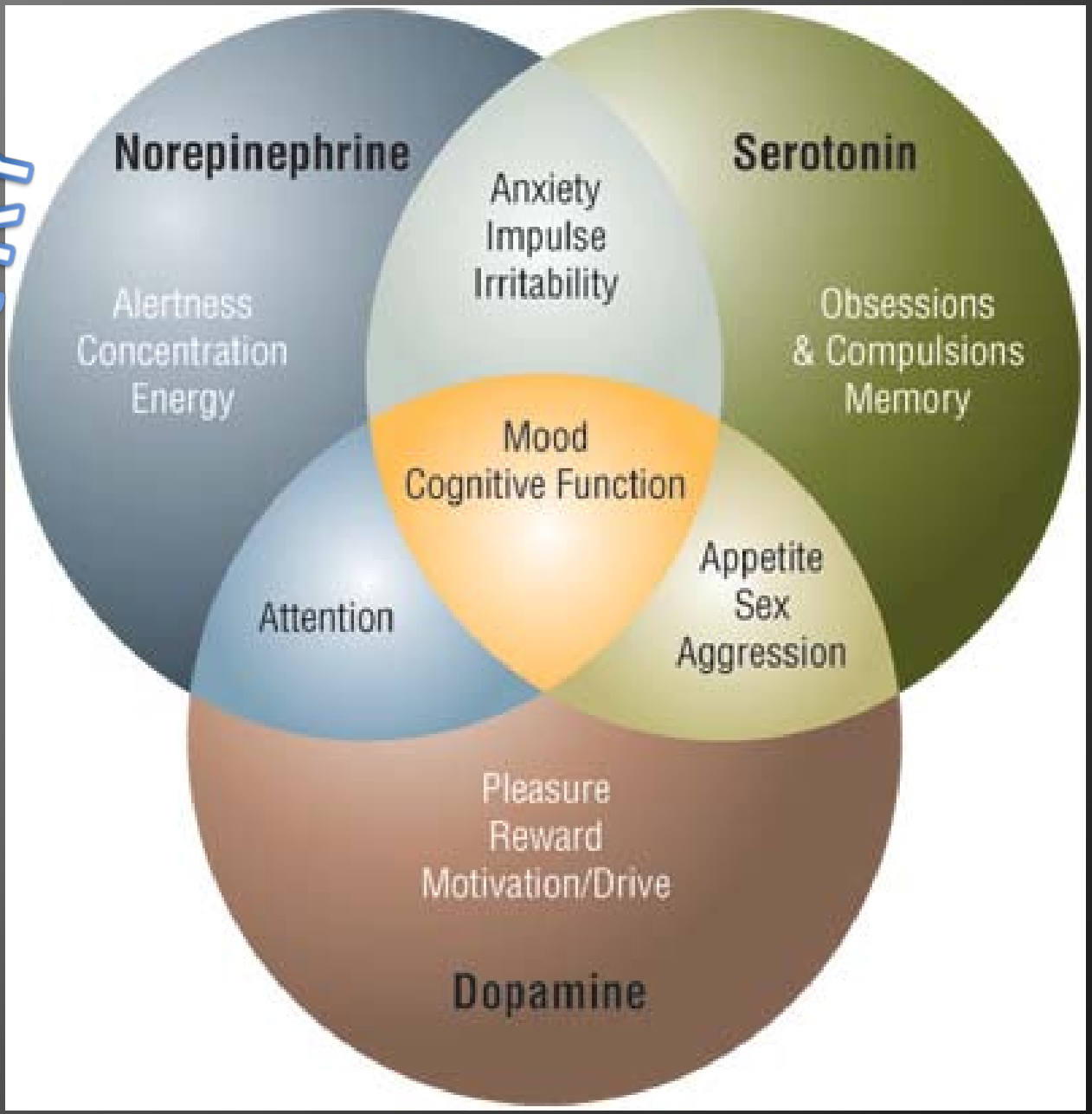
EXERCISE is like taking .....

a little Prozac & a little Adderall

EXERCISE OPTIMZES LEARNING



NEUROCHEMISTRY



EXERCISE PREPARES THE LEARNER

Improves Impulse Control
Improves Behavior
Improves Attention
Decreases Nudginess
Improves Arousal - Lessens Fatigue
Improves Motivation
Helps Mood and Anxiety Regulation
Combats Depression
Improves Self-esteem
Reverses “Learned Helplessness”
Combats Toxic Effects of Stress Hormones

Exercise AND BDNF

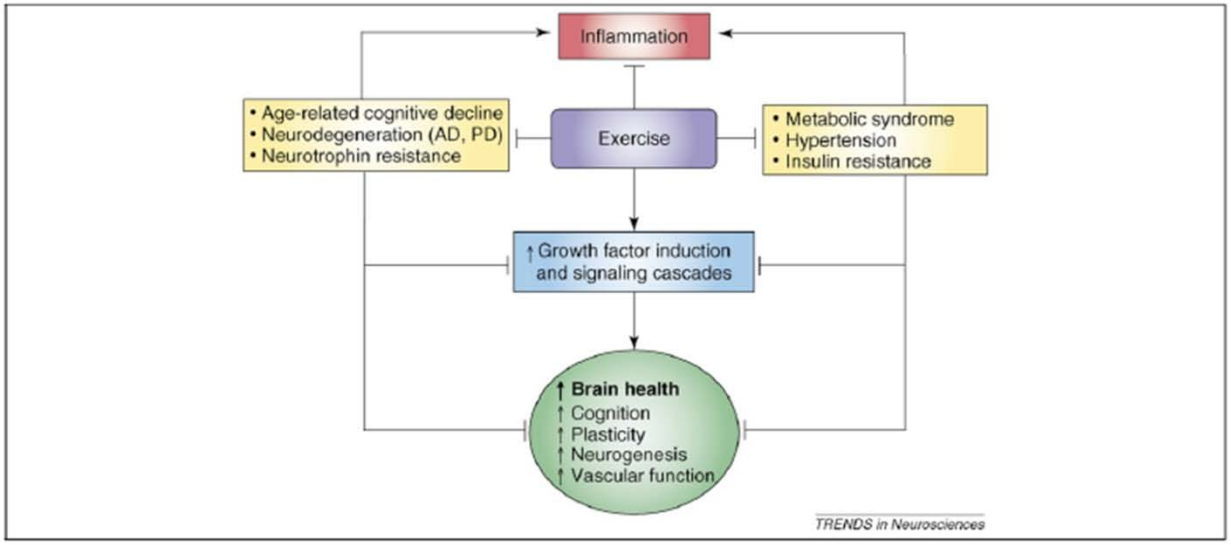


Figure 2. Exercise induces growth factor cascades, a central mechanism mediating exercise-dependent benefits in cognition, synaptic plasticity, neurogenesis and vascular function. In addition, exercise reduces peripheral risk factors for cognitive decline such as hypertension and insulin resistance, components of the metabolic syndrome that converge to increase the risk for brain dysfunction and neurodegeneration. Inflammation, which can impair growth factor signaling, exacerbate the metabolic syndrome and accelerate cognitive decline, is reduced by exercise. Overall, exercise induces growth factor cascades and reduces peripheral risk factors for cognitive decline, all of which converge to improve brain health and function, and to delay the onset of and slow the decline in neurodegenerative diseases including Alzheimer disease (AD) and Parkinson's disease (PD).

EXERCISE HAS AN EFFECT TO INCREASE LIFE FORCES IN MANY WAYS:

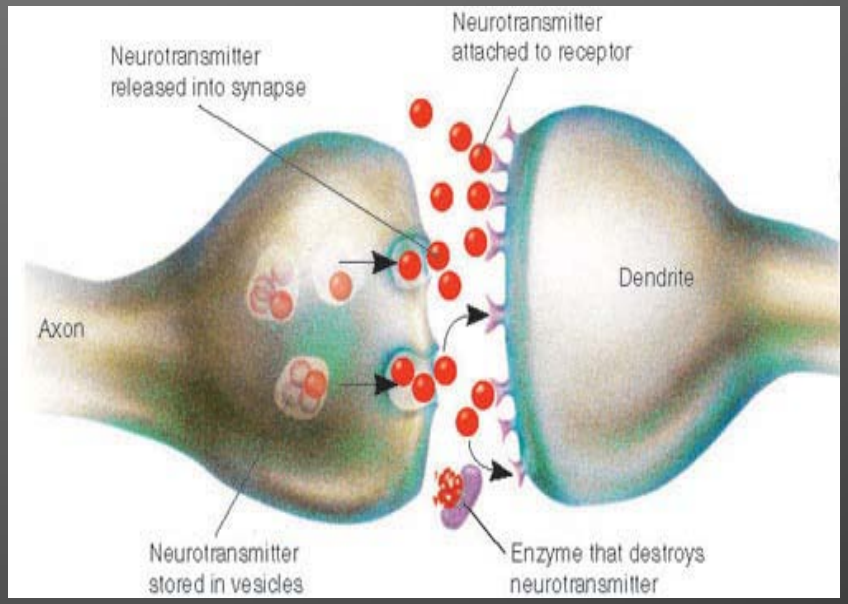
1. SYNAPTIC PLASTICITY
2. NEUROGENESIS
3. COLLATERAL CIRCULATION,
4. Also IMPROVES HBP, DIABETES, OBESITY, OTHER RISK FACTORS

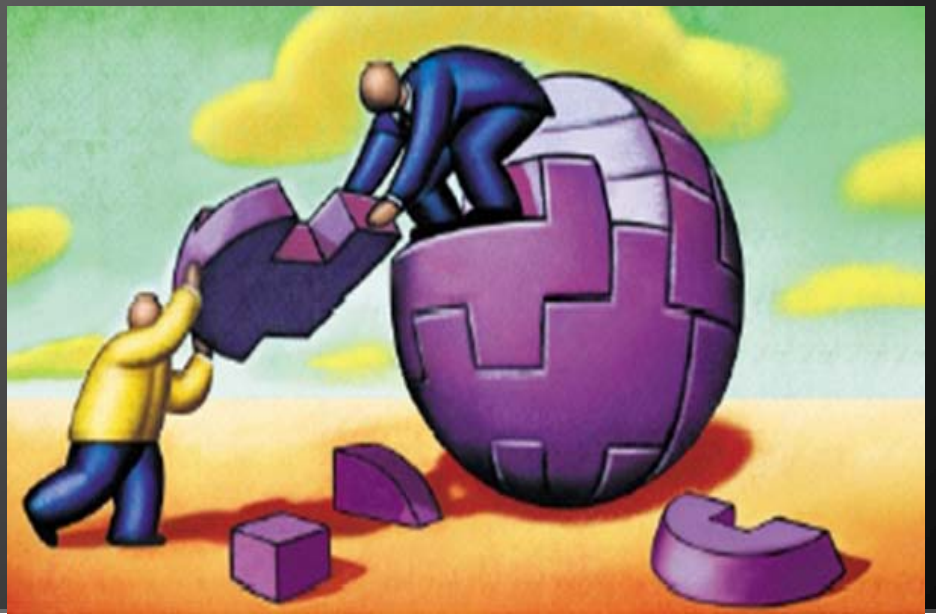
Cotman CW, Berchtold NC, Christie LA.Exercise builds brain health: key roles of growth factor cascades and inflammation. Trends Neurosci. 2007 Sep;30(9):464-72.

EXERCISE

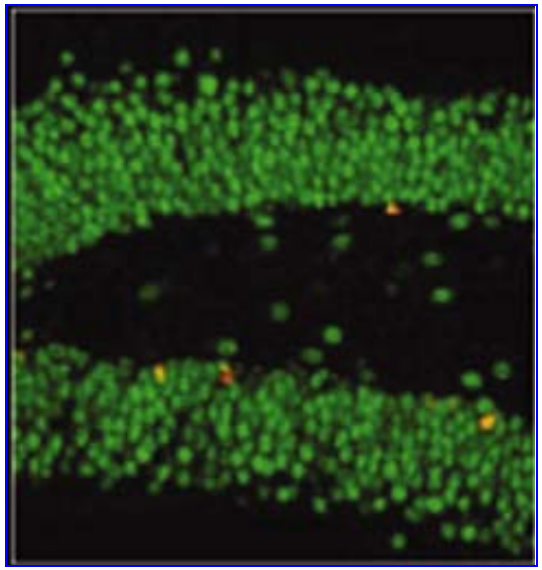
By increasing neurotransmitter activity, improving blood flow and producing Brain Growth Factors - Miracle Grow or Brain Fertilizers - Exercise readies our nerve cells to bind more easily and stronger.

Exercise does this better than any other factor that we are aware of at the present time.

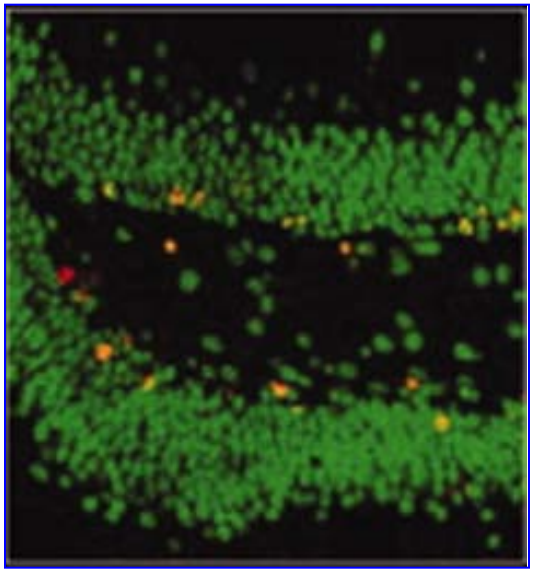




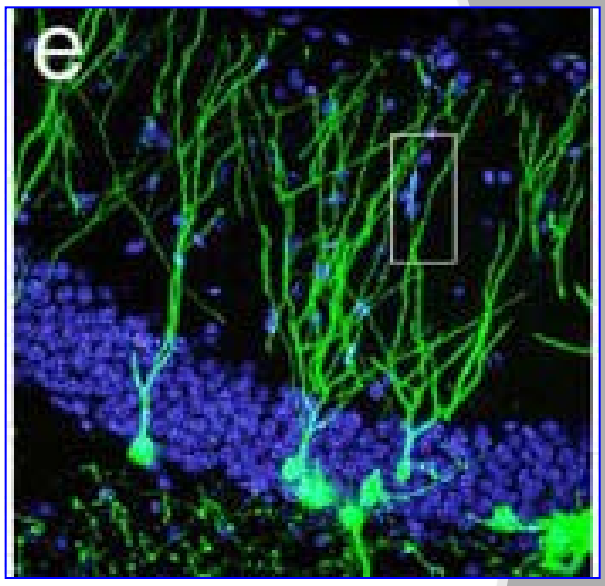
Exercise promotes hippocampus neurogenesis in mice



Control



2 weeks on running wheel

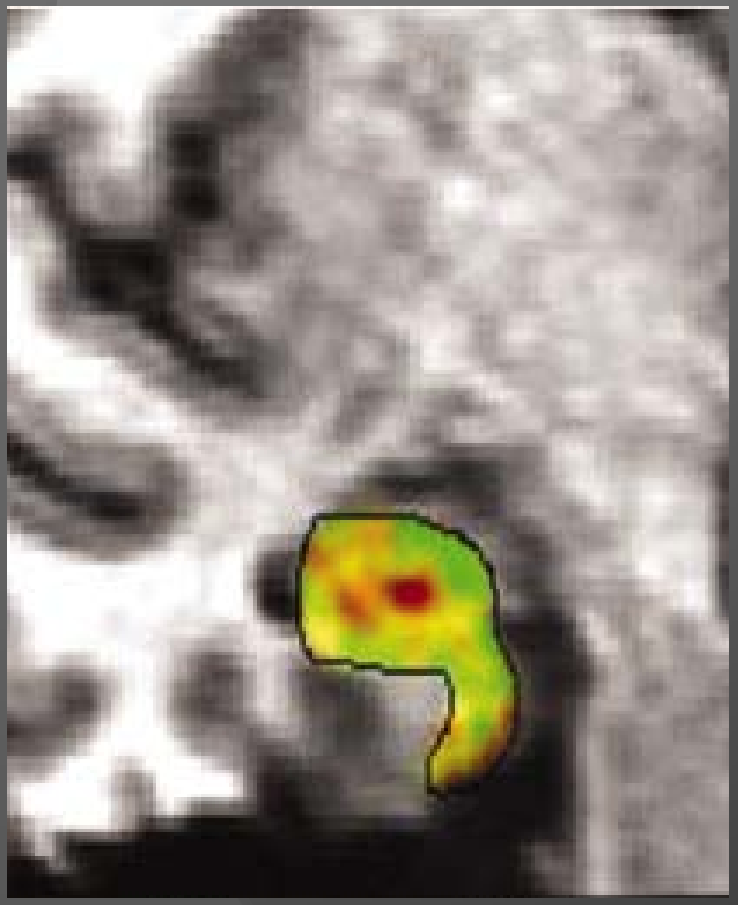


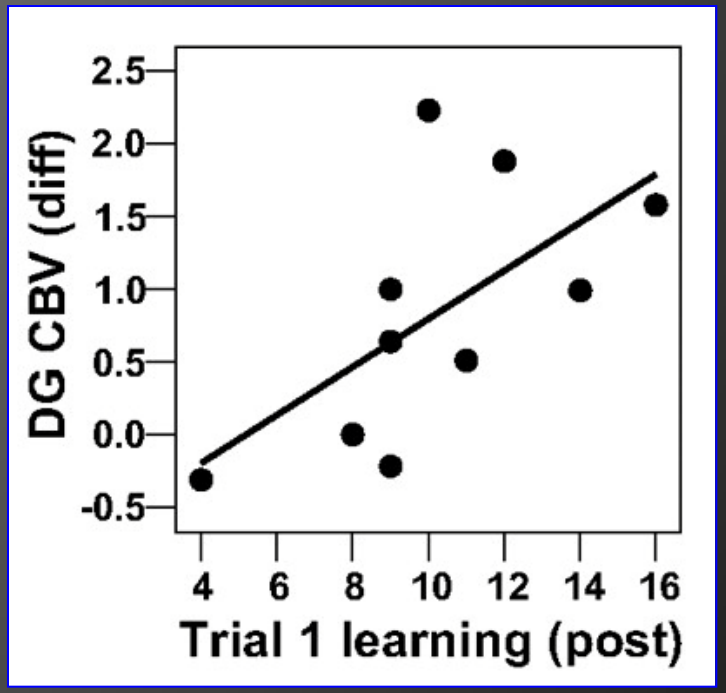
Integration of newborn neurons in hippocampus

Pereira et al, PNAS, 2007; van Pragg, Neuromol Med, 2008

Exercise promotes hippocampus blood flow in humans

Age 21-45, below average fitness
12 weeks: 4X/wk aerobic training; VO2-max





Rey auditory verbal learning test

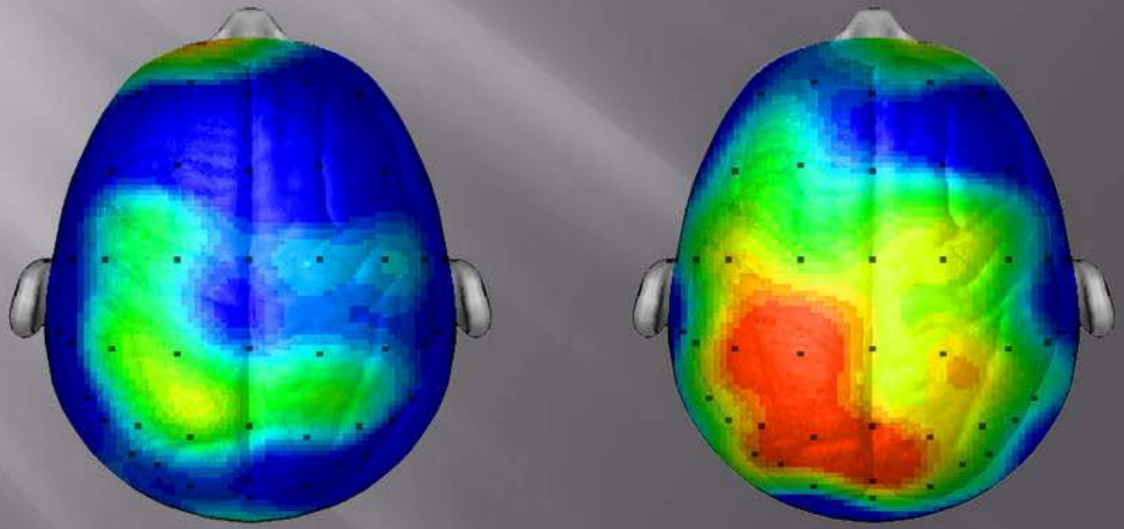
Pereira et al., PNAS 2007

The real breakthrough is the ability to map neurogenesis without slicing into the brain therefore using humans as subjects instead of lab rats.

Average composite of 20 students brains taking the same test

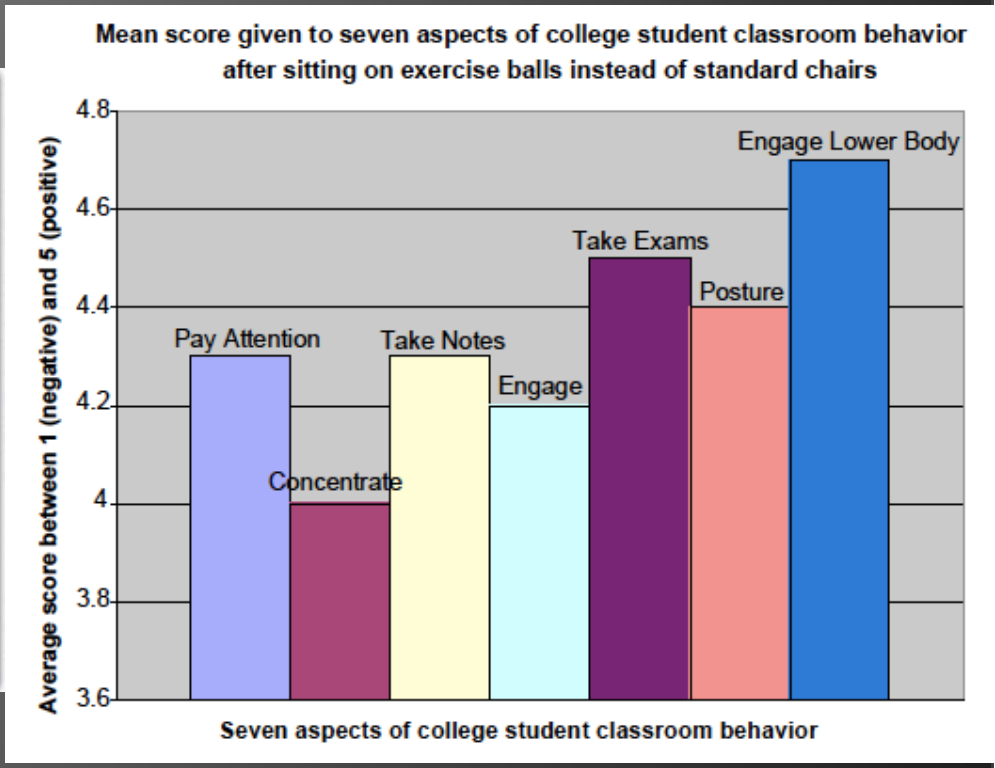
BRAIN AFTER SITTING QUIETLY

BRAIN AFTER 20 MINUTE WALK



Research/scan compliments of Dr. Chuck Hillman University of Illinois

John Kilbourne at Grand Valley State University



"**Greater Balance—**
The body must constantly change its center of gravity in order to remain balanced and still. Greater balance promotes better posture and decreases risk of accidents from falls."

"**Core Strength Training—**
To maintain balance while sitting on an exercise ball, postural muscles (neck, upper and middle back, and shoulder girdle),abdominals, gluteals and leg muscles make constant tiny adjustments."

"**Improved Posture and Body Alignment—**
Sitting on an exercise ball, the body naturally assumes an upright, straight position. In fact, it's very difficult and uncomfortable to slouch on an exercise ball" (Westphal, 2008).

ZOLOFT VS EXERCISE at 4 Months

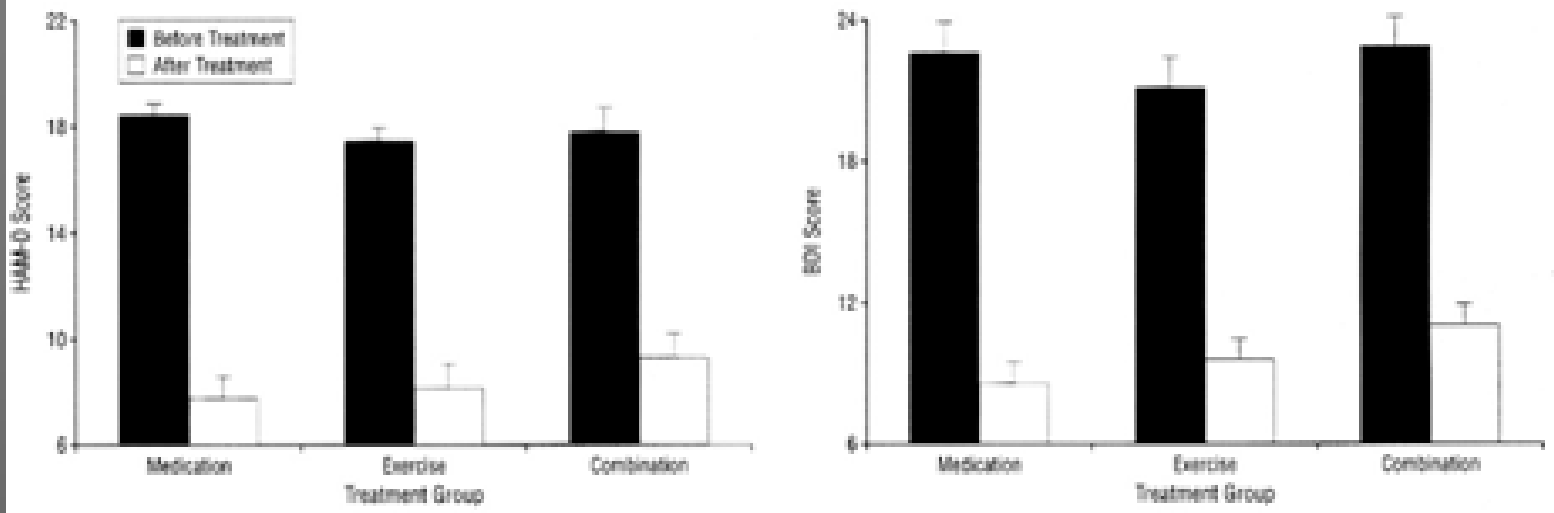


Figure 3. Observed mean depression scores before and after treatment. All changes from pretreatment to posttreatment were statistically significant ($P \leq .001$ for all). The treatment groups did not differ on baseline or posttreatment levels of depression. Error bars represent SEs. HAM-D indicates Hamilton Rating Scale for Depression; BDI, Beck Depression Inventory.
From: Blumenthal: Arch Intern Med, Volume 159(19).October 25, 1999.2349-2356

Post Traumatic Stress Disorder
LEARNED HELPLESSNESS

FAILURE

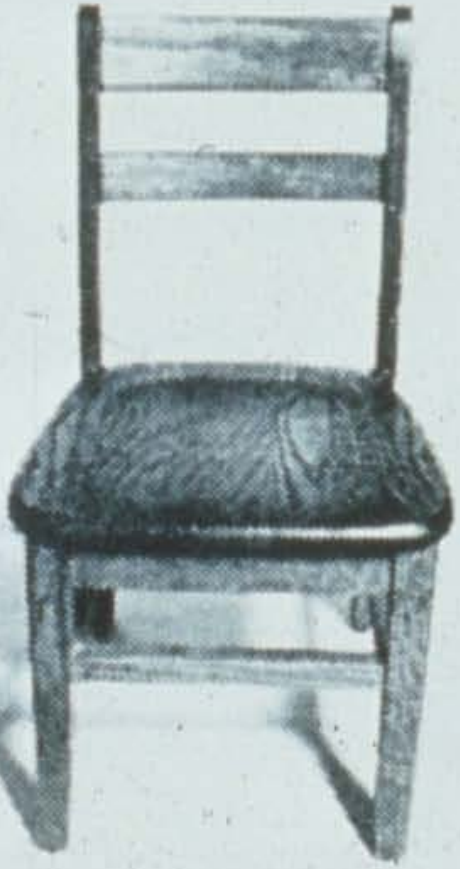
EMBARRASSMENT

SELF-HATE

GIVING UP

CLASS CLOWN

This is a typical hyperactive child.



Funny, he was here just a second ago.

MICHAEL PHELPS OFF RITALIN

At age 9, Michael was put on Ritalin, a stimulant used to treat hyperactivity. His mother thinks it helped a little. He seemed to be able to focus longer, he could get through homework without moving around so much. She said he was still a middling student. It might have raised some C's to B's, she said. But if a homework assignment had to be at least four sentences, she said, He'd just do four sentences.

After two years, Michael asked to get off the meds. He had to go to the school nurse's office to take a pill at lunch, she said, and felt stigmatized.Just out of the blue, he said to me: 'I don't want to do this anymore, Mom.

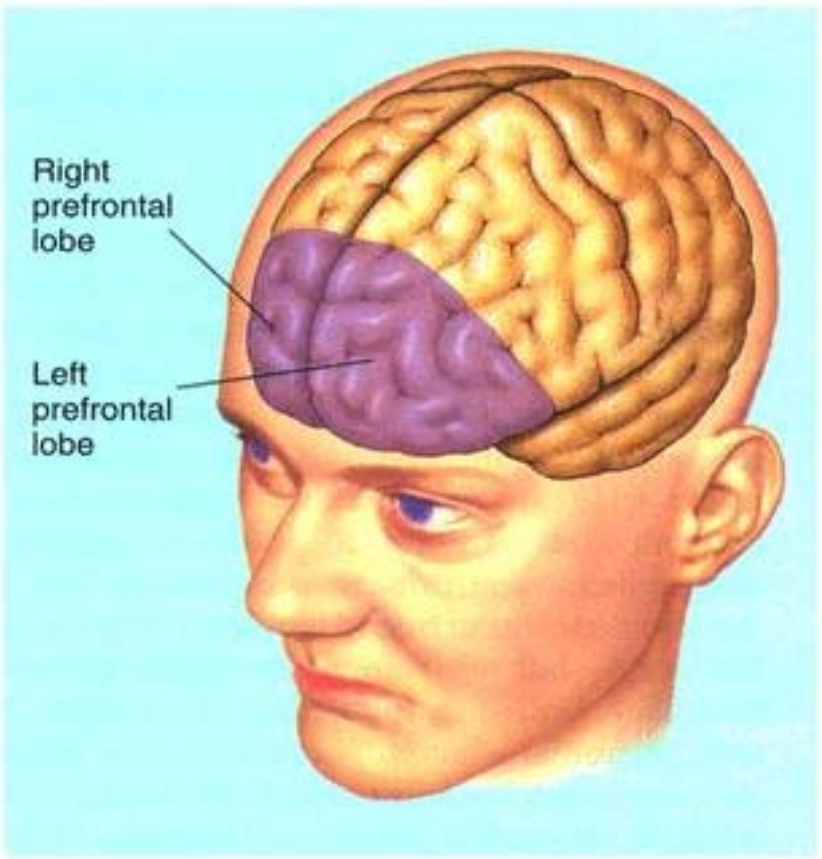
After consulting with the Dr., Michael stopped medication. In the meantime, Michael the swimmer had appeared. By 10, he was ranked nationally in his age group. Ms. Phelps watched the boy who couldn't sit still at school sit for four hours at a meet waiting to swim his five minutes' worth of races.

At age 12 Michael needed an algebra tutor, and was so antsy in school that his mother suggested the teacher sit him at a table in the back. And yet he willingly got up at 6:30 daily for 90-minute morning practices and swam 2 to 3 hours every afternoon.

The Prefrontal Cortex
Major Role in Executive Function

- EXERCISE particularly affects our Executive Function
  - Planning
  - Organization
  - Initiate or delay a response
  - Consequence evaluation
  - Learning from mistakes
  - Maintain the focus
  - Working Memory

- Dysfunction in these areas leads to disruption in the organization and control of behavior



http://www.driesen.com/prefrontal_cortex.htm

HBR LIST 2008

The Board Meeting **of the Future**

BY JOHN J. MEDINA If you wanted to create a work environment in direct conflict with what the brain is equipped to do, you'd design the standard cubicle. Instead, imagine a brain-friendly workplace where board meetings are conducted on treadmills, desks are equipped with stationary bicycles, and people wear gym clothes, not suits.

AT BOARD MEETINGS, people wear gym clothes and walk on treadmills at about 1.6 miles per hour – to cool down right after a period of intense physical activity.

TREADMILLS are installed in the office. Morning and afternoon exercise breaks are encouraged.

WORKSTATIONS include stationary bicycles that fit under the desks. Employees keep their legs moving while answering e-mail.

IN A COMPETITIVE climate, exercise is as close to a magic productivity bullet as you'll get.

The Brain's Active History

If our ancestors sat still in the savanna for eight hours straight – heck, for eight minutes – they became somebody's lunch. Our brains developed while we walked about 12 miles a day, seven days a week, for several million years.

CLINICAL PROOF

Food for Thought

YOU LEARN 20% faster immediately after exercise than after sitting still.

AN ACTIVE LIFESTYLE reduces the risks for Alzheimer's disease, dementia, anxiety, and depression – and for hospital visits. It doesn't take a brain scientist to see the inverse relationship between exercise and health care costs.

STUDY PARTICIPANTS who jog for 30 minutes two or three times a week for 12 weeks improve their cognitive performance. When they stop the exercise regimen, the cognitive benefits evaporate.

Breakthrough Ideas for 2008 Harvard Business Review February 2008

Dr. James Levine keeps a 1 mph pace on his treadmill while checking his e-mail, at the Mayo Clinic in Rochester, Minnesota

BRAIN GAINS

City Park Collegiate, Saskatoon, Saskatchewan

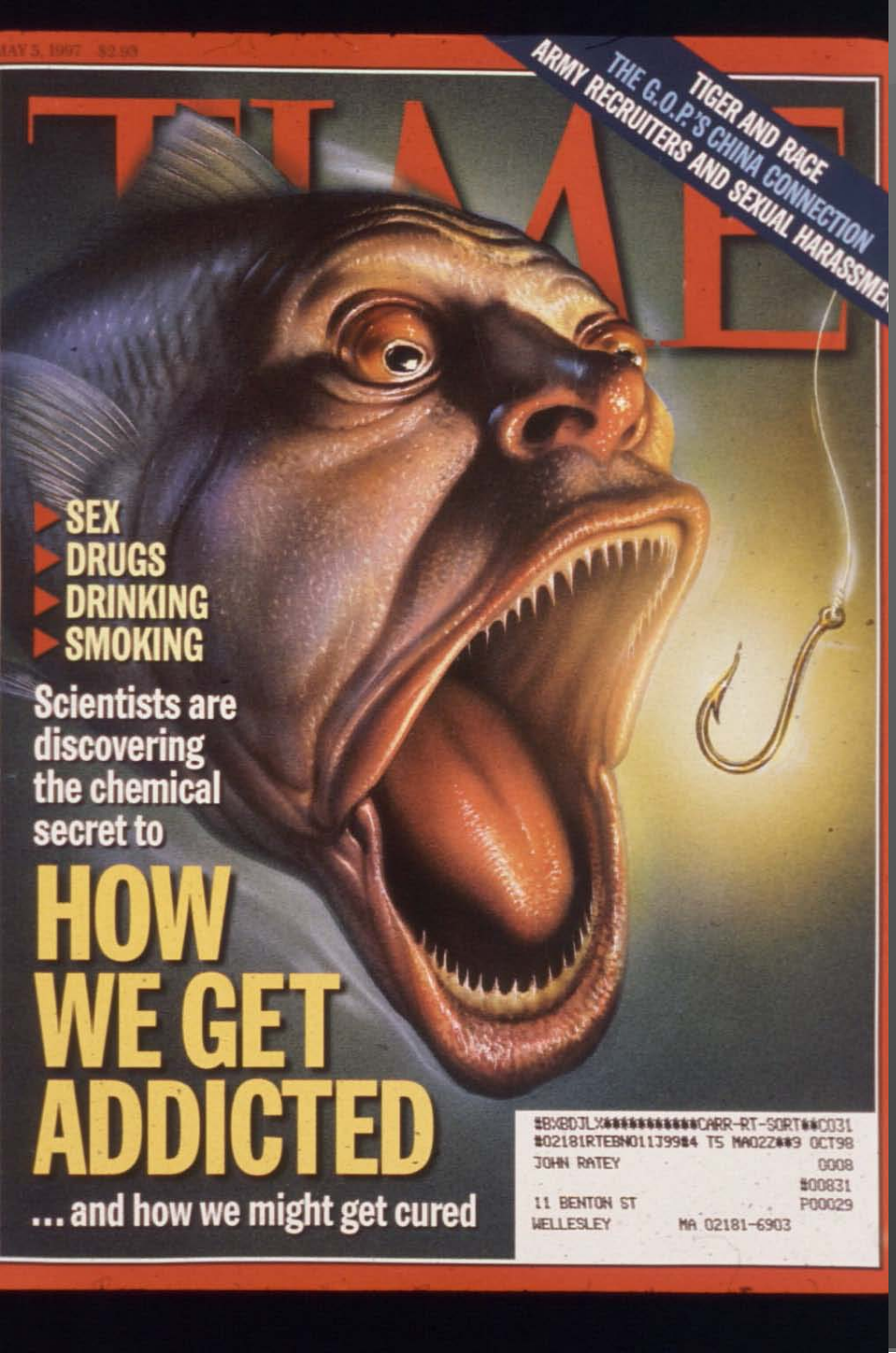
http://www.cbc.ca/national/blog/special_feature/brain_gains/

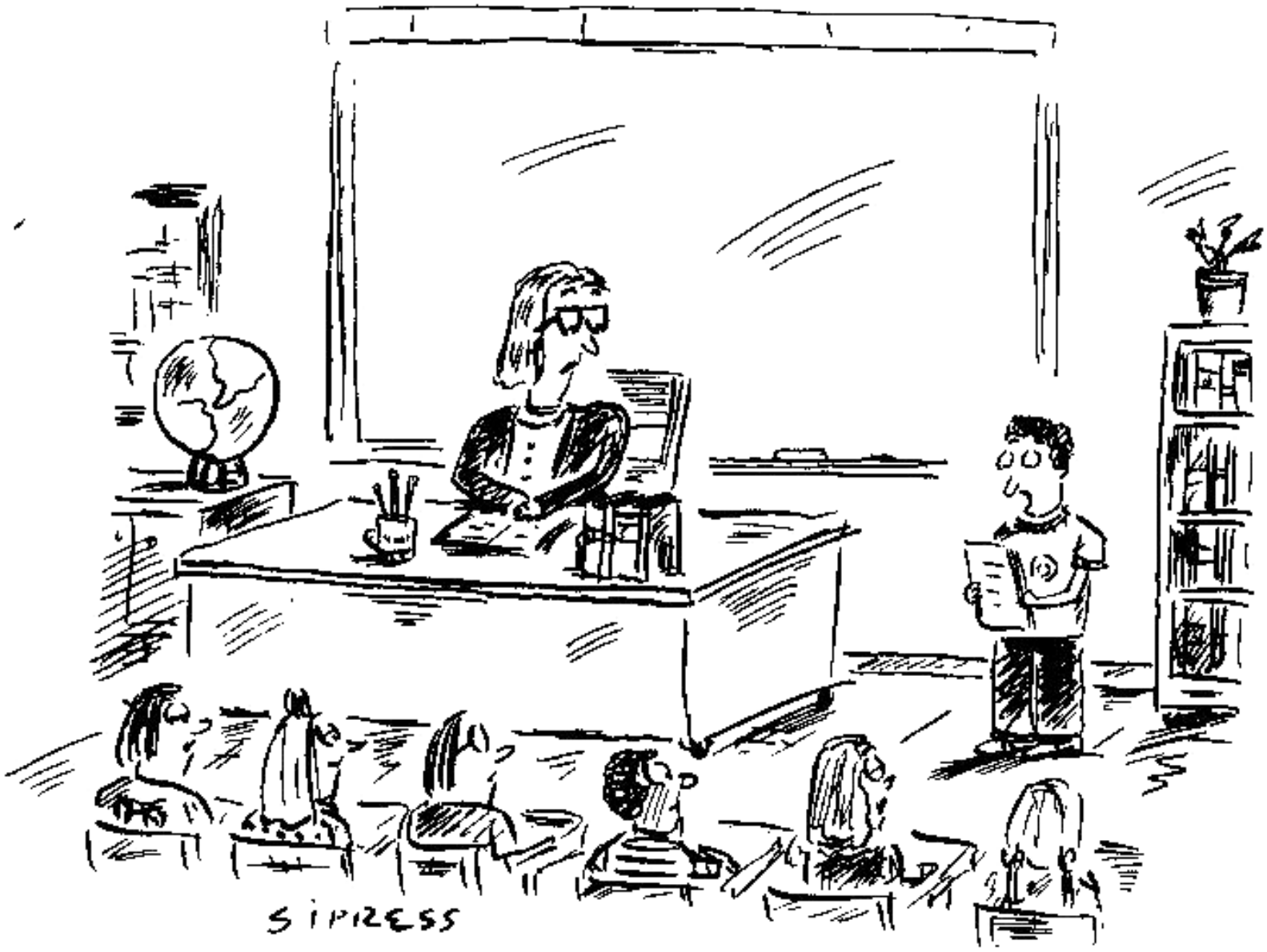
Grade 8 Students

RECESS: FUN, LEARNING, SOCIAL SKILLS

No Morning walk

Time In versus Time Out

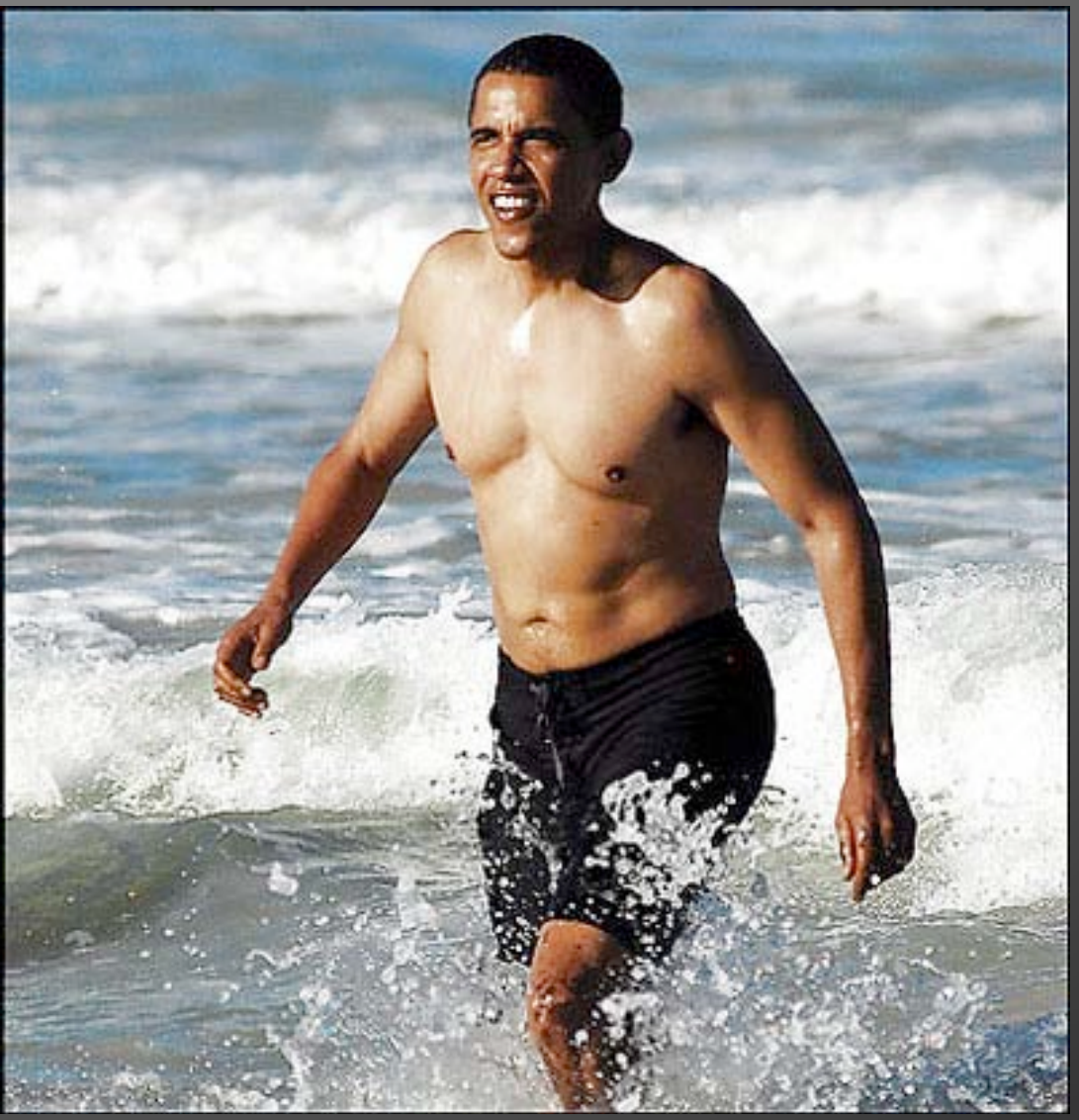

MAY 5, 1997 $2.50
TIME
TIGER AND RACE
THE G.O.P.'S CHINA CONNECTION
ARMY RECRUITERS AND SEXUAL HARASSMEN
SEX
DRUGS
DRINKING
SMOKING
Scientists are discovering the chemical secret to
HOW WE GET ADDICTED
... and how we might get cured
JOHN RATEY
11 BENTON ST
WELLESLEY MA 02181-6903



"'GameBoy: A Memoir of Addiction,' by Ronald Markowitz."

When the Dog walker did not show up

IT IS TIME FOR US TO REALIZE OUR ROOTS AND STOP BEING DRIVEN BY OUR CULTURE



The Time Has Come To Set Childish Things Aside

It Is Time To Get Serious About Play And Exercise

Obama, 1995 autobiography, Dreams From My Father.

" I was a casual drug user, and underachiever."

I put away childish things….decided to run three miles each day.

IT IS ABOUT LIFESTYLE CHANGE AND HEALTH REFORM NOT HEALTHCARE REFORM

Dec 25, 2008. For 48 days straight after the election, Obama exercised 90 minutes a day. Obama's dedication demonstrates that for him, exercise is not so much about recreation, but is a necessity.

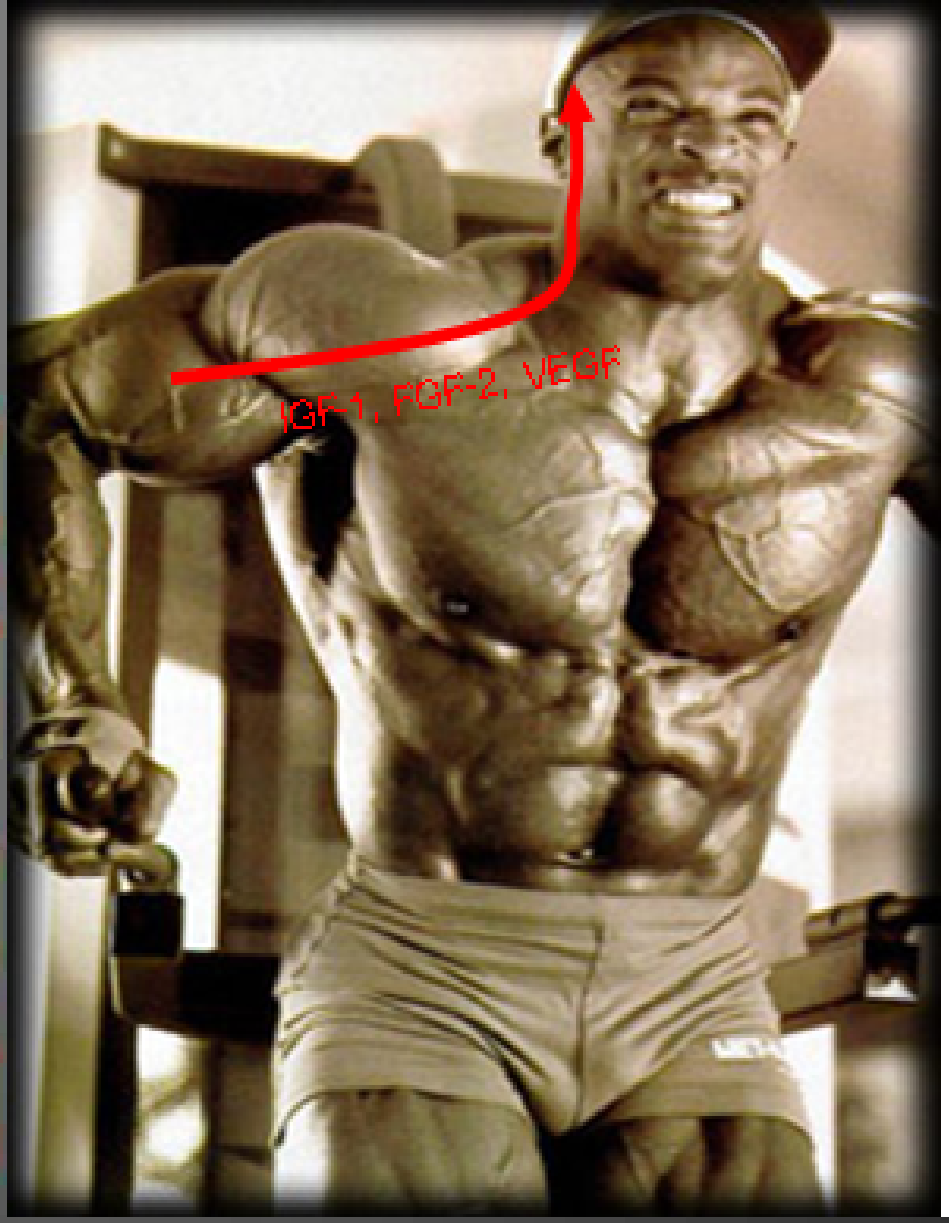
He uses his daily exercise to deal with stress, cravings, help boost his energy, productivity, creativity, and help with that amazing calmness in the face of difficult moments.

IGF-1

FGF-2

VEGF

ANP



BODY ☞ BRAIN

IGF-1 Insulin-like Growth Factor

VEGF Vascular endothelial factor

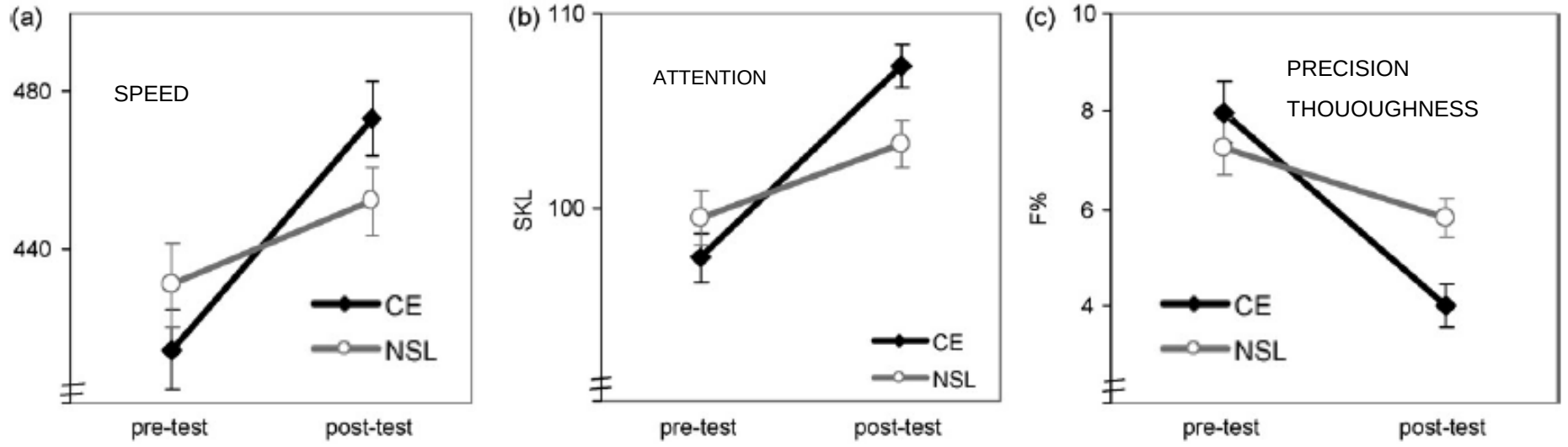
FGF-2 Fibroblast growth factor

ANP- Atrial Natriuretic Factor

ALL THESE COME FROM MUSCLE CONTRACTION AND TRAVEL TO THE BRAIN AND HAVE AN EFFECT ON LEARNING AND BRAIN CELL HEALTH AND GROWTH

The Body and Brain

10 minutes of coordinative exercise (CE) versus regular exercise (NSL)



115 children (13-16yr) of a German elite performance school, half in each group; tested executive function pre and post 10 minutes of exercise.

The total number of responses with the light line being those with just 10 minutes of regular moderate exercise, the black line with 10 minutes of aerobic plus balanced and coordination exercises.

Both groups improved as to baseline, but the balance and coordination half did much better.

Budde H, Voelcker-Rehage C, Pietra˚ yk-Kendziorra S, Ribeiro P, Tidow G. Acute coordinative exercise improves attentional performance in adolescents. Neurosci Lett. 2008 Aug 22;441(2):219-223